Smoking cessation in Secondary Care

Review 1 (Component 5)

Review of effects of nicotine in secondary care

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November 2021: NICE guidelines PH45 (June 2013) and PH48 (November 2013) have been updated and replaced by NG209. The recommendations labelled [2013] or [2013, amended 2021] in the updated guideline were based on these evidence reviews. See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

Glossary

Adverse event	Any adverse change in health or side effect that is documented in a study. This may or may not be considered related to the study medication (see also serious adverse event)
Akathisia	A syndrome that is characterized by a feeling of being unable to sit still or need to move around. This often manifests as a rocking motion when sitting or standing, and crossing and uncrossing legs when sitting, for example. Akathisia is a side effect of anti-psychotic drugs
Aminophylline	A drug that used for the treatment of respiratory disease such as asthma. It acts to dilate the airways making breathing easier.
Area under the Curve (AUC)	This is a term used in pharmacokinetics and represents the area under the curve of blood drug concentration over time. The AUC is a measure of drug bioavailability.
Bioavailability	This is the amount of a drug that appears in the blood after a dose of the drug is taken.
Clearance	Refers to the clearance of a drug from the body (usually via the kidneys)
C_{max}	The maximum blood concentration of a drug reached after a drug is taken.
Cryptorchidism	Absence of one or both testes from the scrotum
Delirium	This is an acute confusional state that is caused by physical and mental illness. It is usually temporary and reversible.
Myocardial infarction	This is more commonly known as a heart attack and it occurs when the heart muscle is deprived of oxygen and muscle cells die.
Nicotine	Nicotine is an alkaloid that is found in the leaves of the tobacco plant. It is present in tobacco smoke and absorbed quickly into the blood. It exerts its main effect in the brain. Nicotine is primarily responsible for tobacco dependence
Nicotine replacement therapy	Nicotine replacement therapy is a licensed medicinal product to aid smoking cessation, smoking reduction and temporary abstinence. There are seven different formats: patch, gum, lozenge, sublingual tablet, nasal spray, mouth spray and inhalator.
Pharmacogenetics	This is the study of variations in genes that give rise to difference responses to drugs
Pharmacokinetics	The study of the fate of drugs when they are taken into the body. This includes absorption, distribution and excretion.
Serious adverse event	This is an adverse event with serious consequence (i.e. results in death or disability, is life-threatening, requires hospitalisation).

$t_{1/2}$	The half-life of a drug. This is the time it takes for blood concentration of the drug to halve.
Theophylline	A drug that used for the treatment of respiratory disease such as asthma. It acts to dilate the airways making breathing easier.
T_{max}	The time it takes for the maximum (Cmax) blood concentration of a drug to be reached.
Warfarin	An anti-coagulant drug (used to thin the blood) that is used in people with atrial fibrillation and those with artificial heart valves

List of abbreviations

ABS	Agitated Behaviour Scale
AE	Adverse event
BAS	Barnes Akathisia Scale
BDI	Becks Depression Inventory
BP	Blood pressure
Bpm	Beats per minute
BPRS	Brief psychiatric rating scale
BSI	Brief Symptom Inventory
CABG	Coronary artery bypass graft
CAD	Coronary artery disease
CBF	Cutaneous blood flow
CBT	Cognitive behavioural therapy
Cmax	Maximum plasma concentration
CO	Carbon monoxide
COPD	Chronic obstructive airways disease
CPD	Cigarettes per day
CVD	Cardiovascular disease
ECG	Electrocardiogram
EDD	Estimated date of delivery
FFA	Free fatty acids
FHR	Fetal heart rate
HAM-D	Hamilton depression rating scale
HR	Heart rate
hr	Hour
ICU	Intensive care unit
INR	International normalised ratio
L	Litre

LBW	Low birth weight
MAP	Mean arterial pressure
ug	Microgram
mg	Milligram
MGA	Mean gestational age
MI	Myocardial infarction
min	Minute
ml	Millilitre
ng	Nanogram
OR	Odds ratio
PANSS	Positive and Negative Symptom Scale
PD	Parkinson's Disease
POMS	Profile of Mood States
PONV	Post-operative nausea and vomiting
PRN	Pro re nata – a Latin phrase used to describe the administration of drugs as needed
PTSD	Post traumatic stress disorder
RCT	Randomised controlled trial
RR	Relative risk
SAE	Serious adverse event
SAH	Sub-arachnoid haemorrhage
SANS	Scale for assessment of negative symptoms
SF-12	12-item short form health survey
STAI	State Trait Anxiety Inventory
Tmax	Time to maximum plasma concentration
YBOCS	Yale-Brown Obsessive-Compulsive Scale

EXECUTIVE SUMMARY

INTRODUCTION

Each year thousands of smokers are admitted to hospitals in the United Kingdom (UK). UK hospitals are now smoke-free, with patients unable to smoke in buildings and in many cases on the hospital grounds. Nicotine replacement therapy (NRT) is usually prescribed for those who need it.

There exist concerns regarding the safety of NRT use in some groups of patients such as cardiac patients and pregnant women. There are also concerns regarding the acute effects of tobacco withdrawal on patients in Intensive Care Units (ICU), and the effects of tobacco abstinence on metabolism of several commonly used medications. Finally, there are concerns about the impact of tobacco abstinence on smokers with mental health illness. These issues are important in considering clinical recommendations regarding stopping smoking and using NRT.

The aim of this review is to assess effects of NRT and of acute nicotine withdrawal on the mental and physical health of people using secondary care and maternity services. The review does not cover health effects of smoking or efficacy of NRT.

METHOD

A comprehensive literature search was conducted using a search strategy developed to capture literature relating to (1) the review population, (2) nicotine use, (3) tobacco use and cessation of tobacco use, and (4) use of medications and any interactions.

The following limitations were applied to the database searches (1) studies published from 1980[1] to December 2011, (2) human studies, and (3) studies published in English.

A total of 19 databases were searched, including AMED, ASSIA, British Nursing Index, and CINAHL. Cochrane Central Register of Controlled Trials and Database of Systematic Reviews, Database of Abstracts of Reviews of Effectiveness, Current Contents, EMBASE, Medline, PsycINFO, Sociological Abstracts, and Web of Knowledge (Science and Social Science Citation Indexes). Websites were also searched for relevant information.

A total of 10,466 records were screened, 442 papers were selected for further review, and 286 of these contained relevant information and are included in the review.

The literature has been organised into three Chapters covering the three populations of interest:

Chapter 1: Hospital patients with physical illness

Chapter 2: Mental health services users

Chapter 3: Pregnant women.

[1] Some papers with a publication date prior to 1980 have been included on request of the PGD

Within the chapters, sections have been created to summarise data related to individual sub-topics addressing concrete clinical issues. Evidence statements have been provided for each section. Data did not allow for any meta-analyses to be undertaken.

FINDINGS AND EVIDENCE STATEMENTS

CHAPTER 1: EFFECTS OF NICOTINE AND OF ACUTE TOBACCO WITHDRAWAL IN HOSPITALISED PATIENTS

We identified 101 studies seeking to determine the health effects of nicotine, primarily nicotine delivered via NRT, and the effects of abstinence from tobacco on hospitalised smokers. We present the findings in 3 parts, with further sub-divisions into sections. Part 1 concerns cardiac patients; Part 2 concerns intensive care unit (ICU) and surgery patients; and Part 3 concerns all other hospital patients.

PART 1: EFFECTS OF NICOTINE IN PATIENTS WITH CARDIOVASCULAR DISEASE

Next to pregnant women, patients with cardiovascular disease (CVD) are considered the group of health service users most sensitive of any potential harm from NRT. There are also concerns about the effect of stopping smoking on metabolism of some CVD drugs.

This part includes 3 sections. Section 1 covers acute effects of nicotine on the cardiovascular system; Section 2 is covering effects of NRT used over extended period of time for smoking cessation; and Section 3 covers the effects of smoking and of tobacco abstinence on CVD medications.

Section 1: Studies of acute effects of NRT

In laboratory studies involving several different NRT formulations, acute effects of NRT on cardiovascular parameters were weaker than effects of smoking. Where participants smoked and used NRT during the same time period, NRT use did not contribute any additional negative effects. No signal of risk that would require further investigation has emerged.

ES 1.1.1 There is strong evidence that the acute effects of NRT on cardiovascular function are significantly smaller than smoking (Benowitz et al. 1993, RCT, [+]; Gembala 2006, non-randomised CT, [+]; Keeley 1996, RCT, [+]; Mahmarian 1997, prospective cohort, [+])

ES 1.1.2 There is moderate evidence that NRT has no acute adverse effect on cardiovascular function in patients with stable CVD (Nitenberg 1999, controlled trial, [+]; Tanus-Santos 2001, controlled cross-over trial, [+])

Section 2: Studies of effects of NRT used to stop smoking

No randomised trial comparing NRT and placebo, or cohort study comparing users of NRT with other groups, found any signal of risk in terms of adverse events, changes in CVD, MI or stroke.

Four case studies reported cardiac events occurring in smokers using NRT. All four concern patches that are the only NRT product, which media linked to cardiac events. A very large

number of cardiac incidents occur daily and they will coincide with practically any activity and medication, but of course a rare causal effect cannot be ruled out.

A systematic review which included studies reporting cardiovascular events following NRT or placebo use in healthy populations concluded that NRT does not cause adverse cardiovascular events in healthy users.

Overall, there is no evidence suggesting that NRT use is unsafe for people with CVD.

ES 1.1.3 There is strong evidence that use of NRT does not lead to adverse events when used in patients with stable CVD (Joseph et al 1996, RCT [++]; The Group for the Study of Transdermal Nicotine in Patients with Coronary Artery Disease 1994, RCT, [++]; Tzivoni et al 1998, RCT [+]; Marsh et al (2005, RCT [+]; Hubbard et al. 2005, Retrospective cohort [+]; Kimmel et al 2001, Case control [+]; Meine et al 2005, Case control [+]; Willmer and Bell 2003, retrospective audit, [-])

ES 1.1.4 There is strong evidence that use of NRT in the general population is not associated with an increased risk of cardiac events (Greenland et al 1998, systematic review, [++]; Hubbard et al. 2005, Retrospective cohort [+]; Allen et al. 1994, RCT [++]) or stroke (Greenland et al 1998, systematic review, [++]; Hubbard et al. 2005, Retrospective cohort [+]).

ES 1.1.5 There is moderate evidence that NRT does not cause any serious adverse events in patients with unstable CVD (Kimmel et al 2001, Case control [+]; Meine et al 2005, case control study [+]; Willmer and Bell 2003, retrospective audit, [-]).

Section 3: Effects of stopping smoking on patients' wellbeing and on CVD medications

Among patients hospitalised for MI or CABG surgery, long-term stress levels decreased in those who stopped smoking, but remained unchanged in smokers.

Stopping smoking may lead to some 12% increase in plasma levels of warfarin. Monitoring of warfarin levels when there is a change in smoking status is recommended.

ES 1.1.6 There is moderate evidence that in smokers with CVD who stop smoking successfully long-term levels of stress decrease rather than increase (Hajek et al. 2010, prospective cohort, [+])

ES 1.1.7 There is moderate evidence that smokers may require higher doses of warfarin to achieve an INR in therapeutic range (seven studies found this: Aquilante et al. 2006, prospective cohort, [+]; Gage et al. 2008, prospective cohort, [+]; Lee et al. 2005, prospective cohort, [+]; Lenzini et al. 2008, prospective cohort, [+]; Millican et al. 2007, prospective cohort, [+]; Mungall et al 1985, retrospective cohort, [+]) Pamboukian et al. 2008, retrospective cohort, [+]), but four studies found no difference between requirements in smokers vs. non-smokers (Mitchell et al. 1972, retrospective cohort, [+]; The University of Illinois at Chicago 1999, case control, [+]; Weiner et al. 1984, retrospective cohort, [+]; Whitley et al. 2007, retrospective cohort, [+])

ES 1.1.8 There is moderate evidence that stopping smoking can lead to an increase in the systemic level of warfarin, with an associated increase in INR (Bachmann et al 1979, prospective cohort, [+]; Kuykendall 2004, case study, [-]; Evans et al (2005, case study, [-])

PART 2: EFFECTS OF NICOTINE AND EFFECTS OF STOPPING SMOKING ON PATIENTS ADMITTED TO ICU OR UNDERGOING SURGERY

Regarding the impact of acute changes in nicotine and smoke intake on surgery outcomes, we found 29 studies that are presented in three sections. Section 1 concerns perioperative outcome; Section 2 concerns the risk of delirium; and Section 3 covers the effects of nicotine and tobacco withdrawal on the perception of pain.

Section 1: Effects of nicotine on perioperative outcomes

Given the number of possible acute effects of both tobacco abstinence and nicotine intake on a number of surgery and ICU outcomes, the literature we identified is limited. It consists primarily of cohort studies that pose problems with interpreting the results because there were normally a number of differences between patients who were and who were not given the patches. Different studies also concerned different populations and different outcomes.

ES 1.2.1 There is mixed evidence regarding the safety of NRT use in critically ill patients. Two studies found an increased risk of mortality associated with NRT use in ICU and bypass surgery patients (Lee et al 2007, retrospective cohort, [+]; Paciullo et al 2009, retrospective cohort, [+]). Three studies found no increased risk of unfavourable outcomes (Panos et al 2010, retrospective cohort, [+]; Carandang et al 2011, retrospective cohort, [+]; Cartin-Ceba et al 2011, prospective cohort [+]). One study found an increased risk of pulmonary complications and seizures but lower risk of mortality in NRT users (Seder et al 2011, retrospective cohort [+]).

ES 1.2.2 There is moderate evidence that the adverse effects on bone healing and post-surgical complications are not due to nicotine (W-Dahl and Toksvig-Larsen 2007, prospective cohort study [+])

ES 1.2.3 There is weak evidence to suggest that nicotine patches should be removed prior to micro vascular reconstructive surgery to limit any possible vasoconstrictive effects of nicotine and surgery using vasopressin injections (Jagadeesan et al. 2007, case study, [-]; Groundine & Morley (1996, case study, [-])

ES 1.2.4 There is strong evidence that smokers who abstain from smoking 10 hours prior to surgery need smaller doses of atracurium for maintenance of anaesthesia than those who smoke up to a few hours before surgery or wear nicotine patches (Puura et al. 1998, RCT [++])

ES 1.2.5 There is strong evidence that chewing nicotine gum prior to surgery is not associated with an increased gastric fluid volume (Soreide et al. 1995, RCT, [++])

Section 2: Effects of smoking, tobacco withdrawal, and NRT on the risk of delirium

A number of hospitals give NRT patches automatically to smokers undergoing surgery and to those admitted to ICUs. Such smokers normally do not ask for NRT and are not bothered by

the need to smoke. They are usually not consulted about receiving the patches. The practice is in place due to a perception that smokers are more likely to suffer from delirium and that NRT may reduce the risk.

The available literature suggests that the practice has no sound evidence base. It should be suspended until randomised trials of effects of NRT on surgery and ICU outcomes provide evidence that this is beneficial rather than irrelevant or harmful.

ES 1.2.6 There is moderate evidence that abstinence from smoking does not increase the risk of delirium. (Four studies found no link: Dubois et al 2001, prospective cohort, [+]; Nicholson et al. 2006, retrospective cohort, [-]; Ouimet et al. 2007, prospective cohort, [+]; Van Rompaey 2009, prospective cohort, [-], while two studies reported a link but did not control for possible confounders: Miyazaki et al. 2011, retrospective cohort, [+]; Lucidarme et al. 2010, prospective cohort, [-])

ES 1.2.7 There is weak evidence that application of NRT is associated with an increased risk of delirium (Cartin-Ceba et al 2011, prospective cohort [-]; Seder et al 2011, retrospective cohort [+]).

Section 3: Stopping smoking and perception of pain

There is some evidence that nicotine may act as an analgesic. This raises a concern that in the context of acute care, stopping smoking may have a negative effect on pain perception and patient comfort. The available evidence suggests that NRT may reduce post-operative pain in non-smokers but definitive trials are needed. Stopping smoking have no long-term effect on pain ratings but the acute effects are not known.

ES 1.2.8 There is good evidence that NRT alleviates post-operative pain in **non-smokers** (Flood and Daniel 2004, RCT, [+]; Habib et al. 2008, RCT, [+]; Hong et al. 2008, RCT, [+]; Yagoubian et al. 2011, RCT, [+])

ES 1.2.9 There is moderate evidence that NRT does not alleviate post-operative pain in **smokers** (Olson et al. 2009, RCT, [-]; Turan et al. 2008, RCT, [+])

ES 1.2.10 There is moderate evidence that in the long-term, smoking cessation has no effect on perception of pain in general population (Shi et al. 2011, retrospective cohort, [+])

PART 3: EFFECTS OF NICOTINE AND EFFECTS OF STOPPING SMOKING IN NON-CARDIAC AND NON-SURGICAL HOSPITAL PATIENTS

This part covers a mixture of studies concerning several topics. It is divided into 3 sections. Section 1 covers studies addressing safety of NRT in non-cardiac patients and effects of smoking ban; Section 2 concerns effects of nicotine and smoking on some medications; and Section 3 concerns the special case of ulcerative colitis.

Section 1a: Safety of NRT in hospital patients

This diverse group of studies did not identify any further risks of NRT use.

ES 1.3.1 There is strong evidence that the use of NRT in medically stable patients is not associated with an increased risk of adverse events (Lewis et al 1998, RCT, [+]; Molyneux et al 2003, RCT, [+]; Murray et al 1996, RCT, [++]; Murray et al 2009, prospective cohort, [+], Wagena et al. 2003, general review, [+])

ES 1.3.2 There is moderate evidence that renal disease can impair nicotine clearance (Molander et al 2000, prospective cohort, [+]; Whiss et al. 2000, prospective cohort, [+])

ES 1.3.3 There is moderate evidence that nicotine use in patients with renal disease does not adversely affect platelet function (Whiss et al. 2000, prospective cohort, [+])

ES 1.3.4 There is moderate evidence that nicotine has little effect on insulin secretion (Epifano et al. 1992, randomized cross-over study, [+]; Axelsson et al. 2001, randomized cross-over study, [+])

ES 1.3.5 There is moderate evidence that medicinal nicotine is associated with insulin resistance, although significantly less so than smoking (Epifano et al. 1992, randomized cross-over study, [+]; Axelsson et al. 2001, randomized cross-over study, [+])

Section 1b: Effects of smoking ban on hospital patients

Most smokers hospitalised in smoke-free hospitals experience some degree of tobacco withdrawal symptoms, but this is mostly mild and only a minority find abstinence in this setting difficult.

ES 1.3.6 There is moderate evidence that smokers who cannot smoke in hospital can experience some tobacco withdrawal symptoms (Rigotti et al 2000, prospective cohort, [+]; Zabaneh 1994, case study [-]; Carmel 2007, case study, [-]; Gallagher 1998, case study, [-]; Rosin et al 2001, case study, [-])

Section 2: Effects of tobacco withdrawal on theophylline, aminophylline, and insulin

Smoking and stopping smoking have an effect on the metabolism of a number of medicines. Theophylline levels are sensitive to smoking and abstinence and aminophylline levels are influenced even by passive smoking. In patients who change their smoking status, doses of these drugs need to be monitored and adjusted. There are inconsistent data regarding the effect of smoking on the absorption of subcutaneous insulin.

ES 1.3.7 There is moderate evidence that theophylline levels are sensitive to smoking and abstinence (Lee et al 1987, quasi-experimental, [+]; Rao 1996, case study, [-]) and aminophylline levels are influenced even by second hand smoke (Mayo et al. 2001, case control study, [+]). One study, Eldon et al. 1987 (cross-over trial, [+]), showed no effect of a 36-hour period of abstinence on serum theophylline levels.

ES 1.3.8 There is moderate evidence that nicotine does not influence theophylline levels (Lee et al 1987, quasi-experimental, [+])

ES 1.3.9 There are inconsistent data regarding the interaction between subcutaneous insulin and smoking (Klemp et al. 1982, quasi-experimental, [+]; Muhlhauser et al. 1984, quasi-experimental, [+])

Section 3: effects of smoking and smoking cessation on ulcerative colitis

Ulcerative colitis (UC) is an inflammatory disease of the colon, which is seen primarily in non-smokers and ex-smokers. Nicotine seems to be beneficial for UC, and stopping nicotine intake may lead to worsening of the disease.

ES 1.3.10 There is strong evidence that NRT can have positive effects on ulcerative colitis (Guslandi et al 1998, RCT, [+]; Guslandi et al 2002, RCT, [+]; Ingram 2005, RCT, [+]; Pullan et al 1994, RCT, [+]; Sandborn 1997, RCT, [+]; Thomas et al 1996, RCT, [+]; McGarth et al. 2009, systematic review [++]; Nikfar et al. 2010, systematic review [+])

ES 1.3.11 There is moderate evidence that smokers with ulcerative colitis experience worsening of their symptoms when they stop smoking (Bastida et al, review (+), Beaugerie et al 2001, retrospective cohort, [-]; Green et al 1998, retrospective cohort, [-]; Wahed et al. 2011, retrospective cohort, [-])

CHAPTER 2: EFFECTS OF NICOTINE USE AND EFFECTS OF TOBACCO WITHDRAWAL IN PATIENTS WITH MENTAL ILLNESS

The main hypothesis for why smoking rates are exceptionally high in people with mental health illness is that they smoke to alleviate some of the symptoms associated with their illness. The concern is therefore that when such patients stop smoking, either of their own accord or because they are forced to abstain, their functioning may deteriorate. There is also a specific concern that concurrent stopping smoking may undermine the efficacy of treatments for patients with alcohol and drug addictions. Finally, smoking affects the speed with which a number of psychiatric drugs are metabolised and stopping smoking may lead to an increase in drug side effects.

In this chapter we review literature concerning the effects of abstinence and of stop-smoking treatments on psychiatric symptoms and psychiatric medications, and also the literature on the effects of smoking cessation on treatment outcome of other drug dependencies.

We identified 92 relevant papers. The material is organised into the following Parts:

1. Effects of tobacco abstinence and effects of stop-smoking medications on mental health
2. Effects of tobacco abstinence on psychiatric medications
3. Effects of smoking cessation on the outcome of other substance abuse treatment;
4. Effects of smoke free policy on behaviour and psychiatric symptoms of psychiatric in-patients.

PART 1: EFFECTS OF SMOKING CESSATION AND EFFECTS OF NRT ON MENTAL HEALTH OF PSYCHIATRIC PATIENTS

Enforced abstinence from smoking can induce acute discomfort, but in the small self-selected group of patients who manage to achieve longer-term abstinence, no deterioration

of mental health was observed. Bupropion promotes smoking cessation and may have positive effects on mood.

ES 2.1 There is strong evidence that PTSD patients who manage to stop smoking do not experience any worsening of their condition (McFall et al 2005, RCT [+]; McFall et al 2010, RCT [++])

ES 2.2 There is good evidence that in patients with schizophrenia, overnight abstinence from smoking can increase negative symptoms (Smith et al 2002, cross over trial, [++])

ES 2.3 There is moderate evidence that short (7 days) smoking abstinence does not lead to cognitive deterioration but may slow down psychomotor speed (Evins et al 2005a and 2005b, RCT [+])

ES 2.4 There is weak to moderate evidence that patches may decrease agitation in smokers with schizophrenia with acute symptoms admitted to non-smoking wards but increase involuntary movements (Allen et al 2011, RCT [+], Dalack et al 1999, RCT [+])

ES 2.5 There is strong evidence that treatment with bupropion for smoking cessation does not lead to any deterioration in mental health (Tsoi et al 2010a, systematic review [+]; Tsoi et al 2010b, systematic review [+]; Banham & Gilbody 2010, systematic review [+]; Evins et al 2001, RCT [+]; Evins et al 2005a and 2005b, RCT [+]; Evins et al 2007, RCT [+]; Fatima et al 2005, cross over trial, [+]; George et al 2002, RCT [+]; George et al 2008, RCT [+]).

ES 2.6 There is moderate evidence that treatment with bupropion may lead to improved mood and reduction in akathisia (Evins et al 2001, Evins et al 2007, RCT [+]; RCT [+]; George et al 2002, RCT [+])

ES 2.7 There is strong evidence that receiving smoking cessation interventions (which is not the same as stopping smoking, which very few of the recipients of such interventions achieve) does not adversely affect mental health (Allen et al 2011, RCT [+]; Baker et al 2006, RCT [+]; Evins et al 2001, RCT [+]; Evins et al 2005a and 2005b, RCT [+]; Evins et al 2007, RCT [+]; Fatima et al 2005, cross over trial, [+]; Gallagher et al 2007, RCT [+]; George et al 2000, RCT [+]; George et al 2002, RCT [+]; George et al 2008, RCT [+]; Williams et al 2010, RCT [+]).

ES 2.8 There is good evidence that among patients with schizophrenia or schizoaffective disorder, those who manage to stop smoking do not experience any worsening in their condition (Evins et al 2007, RCT [+]; Gallagher et al 2007, RCT [+]; Williams et al 2010, RCT [+])

ES 2.9 There is moderate evidence that mood improves in depressed smokers who manage to stop smoking compared to those who fail in their quit attempt (Blalock et al 2008, prospective cohort [+]; Thorsteinsson et al 2001, RCT [+])

PART 2: EFFECTS OF STOPPING SMOKING ON PSYCHIATRIC MEDICATION

Several common psychiatric medications are metabolised faster by smokers than by non-smokers. The corollary of this finding is that in stable patients on well-tolerated medication doses, stopping smoking is likely to increase systemic levels of these drugs and needs to be accompanied by dose adjustments. We found no data on whether NRT mitigates the effects of stopping smoking on increasing systemic levels of these medications, but it is unlikely to do so.

ES 2.10 There is strong evidence that clozapine and olanzapine are metabolised much faster by smokers, and stopping smoking can increase their systemic levels (Derenne & Baldessarini 2005, case study, [-]; Dettling et al. 2000, prospective cohort [+]; Diaz et al 2005, randomised non-controlled trial, [+]; Haring et al. 1989 retrospective cohort [+]; Haslemo et al 2006, prospective cohort [+]; Meyer 2001, case control study [+]; Ozdemir et al 2001, prospective cohort [+]; Pettitt et al. 2009, case study, [-]; Rostami-Hodjegan et al. 2004, retrospective cohort [+]; Sandson et al. 2007, case study, [-]; Seppala et al. 1999, prospective cohort [+]; van der Weide et al. 2003, retrospective cohort, [+]; Wenzel-Seifert et al 2011, retrospective cohort [+]; Wetzel et al. 1998, prospective cohort [+]; Callaghan et al. 1999, prospective cohort [+]; Carrillo et al. 2003, prospective cohort [+]; Gex-Fabry et al 2003, retrospective cohort [+]; Skogh 2002, retrospective cohort [+]; Wu et al. 2008, prospective cohort [+]). Although two studies found no significant effects of smoking on serum clozapine levels (Hasegawa et al. 1993, prospective cohort [+]; Palego et al. 2002, prospective cohort [+]).

ES 2.11 There is moderate evidence that haloperidol is metabolised faster by smokers than by non-smokers (Jann et al. 1986, prospective cohort [+]; Miller et al. 1990, prospective cohort [+]; Perry et al. 1993, retrospective cohort [+] found a difference, Fukunda 2000, retrospective cohort [+]) found no difference)

ES 2.12 There is moderate evidence that chlorpromazine is metabolised faster by smokers than by non-smokers (Chetty et al. 1994, retrospective cohort [+]; Pantuck et al 1982, prospective cohort, [+]; Stimmel and Falloon (1983, case study [-])

ES 2.13 There is moderate evidence that fluphenazine, perphenazine and thioridazine are metabolised faster by smokers than by non-smokers (Ereshefsky et al 1985, retrospective cohort [+]; Jin et al 2010, prospective cohort [+]; Berecz et al 2003, prospective cohort [+])

ES 2.14 There is weak evidence that methadone levels increase following a reduction in smoking (Wahawisan et al 2011, case study, [-]).

ES 2.15 There is moderate evidence that smoking does not affect the metabolism of triazolam, diazepam or midazolam (Ochs et al. 1987, prospective cohort [+]; Otani et al. 1997, prospective cohort [+]; Ochs et al. 1985, prospective cohort [+]).

ES 2.16 There is inconsistent evidence regarding the effect of smoking on alprazolam. One study showed that smoking was associated with increased clearance (Hossain et al. 1997, prospective cohort [+]). Another found that smoking had no effect on any pharmacokinetic parameters (Otani et al. 1997, prospective cohort [+]).

ES 2.17 There is weak evidence that smoking increases the metabolism of desmethyldiazepam when given orally (Norman et al. 1981, prospective cohort [+]), but not intravenously (Ochs et al. 1986, prospective cohort [+]).

ES 2.18 There is weak evidence that smoking has no effect on the clearance of carbamazepine (Martin et al. 1991, retrospective cohort, [+])

ES 2.19 There is moderate evidence that the metabolism of quetiapine (an atypical antipsychotic) is unaffected by tobacco smoke (DeVane & Nemeroff 2001, review [+]).

ES 2.20 There is weak evidence that smoking increases metabolism of two selective serotonin reuptake inhibitors duloxetine (Fric et al. 2008, retrospective cohort [+]) and fluvoxamine (Spigset et al. 1995, prospective cohort [+]).

ES 2.21 There is weak evidence that smoking has no effect on the metabolism of thiothixene (Ereshesfsky et al. 1991, retrospective cohort, [+]).

ES 2.22 There is weak evidence that smoking is associated with lower plasma levels of clomipramine (John et al. 1980, prospective cohort, [+]) and imipramine (Perel et al. 1976, retrospective cohort, [+]).

ES 2.23 There is inconsistent evidence regarding the effect of smoking on amitriptyline and nortriptyline. Two studies showed smoking was associated with lower plasma levels of these drugs (Linnoila et al. (1981, prospective cohort, [+]; Perry et al. 1986, prospective cohort, [+]) and three studies found no effect of smoking on pharmacokinetic parameters (Norman et al. 1977, prospective cohort, [+]; Rickels et al. 1983, prospective cohort, [+]; Ziegler & Biggs 1977, prospective cohort, [+]).

ES 2.24 There is weak evidence that smoking has no effect on the metabolism of zotepine (Kondo et al. 1996, prospective cohort [+]).

ES 2.25 There is moderate evidence that the metabolism of zuclopenthixol (an antipsychotic drug) is unaffected by tobacco smoke (Jaanson et al. 2002, prospective cohort [+]; Jorgensen et al. 1985, prospective cohort [+]).

PART 3: EFFECTS OF SMOKING CESSATION INTERVENTIONS ON THE USE OF OTHER SUBSTANCES

The question of whether people undergoing drug and alcohol treatments should be encouraged to stop smoking at the same time has no generally accepted answer at the moment. There are concerns that removing one source of gratification may make the others more precious, or that self-control is a limited resource and that refraining from one desired activity may undermine self-control in other areas. On the other hand, some drug and alcohol advisors emphasise the importance of a fresh start free of all addictive substances and many tobacco control specialists promote smoking cessation as a priority in any setting.

A number of studies show that the provision of stop-smoking treatments does not undermine concurrent treatments for alcohol and drug dependence. However, the majority of these studies analysed only the effects of treatment allocation, and the large majority of smokers did not manage to stop smoking. The questions of whether actual stopping smoking helps with or undermines drug and alcohol sobriety, and whether concurrent or sequential treatments yield better results, have not been fully answered so far and await future trials. (This does not concern methadone maintenance treatment, where in stable patients stopping smoking has no negative effects).

ES 2.25 There is strong evidence that receiving smoking cessation treatment (as opposed to actually stopping smoking) does not undermine concurrent treatments for other drug addictions (Brown et al 2001, RCT [+]; Burling et al 2001, RCT [+]; Campbell et al 1995, prospective cohort, [+]; Cooney et al 2007, RCT [+]; Cooney et al 2009, RCT [+]; Dunn et al 2009, prospective cohort [+]; Grant et al 2007, RCT [+]; Haug et al 2004, RCT, [+]; Kalman et al 2001, RCT [+]; Okoli et al 2010, general review [+]; Prochaska et al 2004, systematic review, [+]; Reid et al. 2008, RCT [+]; Richter et al 2005, prospective cohort, [-]; Shoptaw et al 2002, RCT [+])

ES 2.26 There is good evidence that in alcoholics, smoking deprivation does not increase cue-induced urge to drink (Cooney et al 2003, randomised cross over trial [++])

ES 2.27 There is good evidence that abstinence from smoking does not undermine opioid maintenance treatment in successfully maintained patients (Campbell et al 1995, prospective cohort, [-]; Dunn et al 2009, prospective cohort [+]; Haug et al 2004, RCT, [+]; Okoli et al 2010, general review [+]; Richter et al 2005, prospective cohort, [-]; Shoptaw et al 2002, RCT [+])

ES 2.28 There is moderate evidence that being unable to smoke during treatment reduces the efficacy of inpatient treatment for cocaine dependence (Joseph et al 1993b, retrospective cohort [+])

ES 2.29 There is good evidence that being unable to smoke during treatment encourages successful smoking cessation later (Joseph et al 1990, prospective cohort [+]; Joseph 1993a, prospective cohort [+]; Joseph et al 2004, RCT [+])

ES 2.30 There is weak evidence that smoking cessation treatment may assist with abstinence from opiates (Shoptaw et al 2002, RCT [+]), although a small prospective cohort study showed no beneficial effect (Shoptaw et al 1996, prospective cohort, [-]).

ES 2.31 There is weak evidence that smoking cessation is associated with abstinence from alcohol at long-term follow-up (Grant et al 2007, RCT [+]).

PART 4: EFFECTS OF SMOKE-FREE POLICY ON BEHAVIOUR AND SYMPTOMS IN PSYCHIATRIC IN-PATIENTS

Smoking bans generate a significant increase in patients' weight and in systemic levels of clozapine and probably other drugs. Otherwise the reviewed papers provide mixed information, with some studies reporting some negative impact on symptoms and behaviour (mostly only during the initial implementation), some finding no adverse effects, and some reporting positive effects.

ES 2.31 There is mixed evidence regarding the effect of smokefree policy on behaviour and symptoms in inpatients with mental illness. Five studies found some signs of worsening functioning within a few weeks of the ban (Cole et al 2010, retrospective cohort [+]; Cormac et al 2010, prospective cohort [+]; Harris et al 2007, retrospective cohort [+]; Ryabik et al 1994, prospective cohort [+]; Velasco et al 1996, retrospective cohort [+]). Three studies found no change after smoking ban (Resnick & Bosworth 1989, retrospective cohort [+]; Shetty et al 2010, retrospective cohort [+]; Voci et al 2010, retrospective cohort [+]) and four studies found improvements in disruptive behaviours (Hempel et al 2002, retrospective cohort [+]; Hollen et al 2010, retrospective cohort [+]; Smith et al 1999, prospective cohort [+]; Quin et al 2000, prospective cohort [+])

ES 2.32 There is moderate evidence that total smoking bans generated a significant weight gain (Harris et al 2007, retrospective cohort [+]; Hempel et al 2002, retrospective cohort [+])

ES 2.33 There is good evidence showing that total smoking bans lead to increased systemic levels of clozapine and a need to lower its dosing (Meyer 2001, case control study [+]; Cormac et al 2010, prospective cohort [+]; Shetty et al 2010, retrospective cohort [+])

CHAPTER 3: SAFETY OF NICOTINE REPLACEMENT IN PREGNANCY

The available evidence suggests that NRT is safer than smoking, although probably not entirely safe. There are currently no safety reasons to withhold NRT from pregnant women who are unable to stop smoking without it. However, given the 'probably not entirely safe' verdict and the question marks about NRT efficacy in this population, there is a strong rationale for examining safety and efficacy of varenicline in pregnant smokers.

ES 3.1 There is strong evidence that in some conditions nicotine patches can deliver as much nicotine as smoking, but have overall smaller effects on foetal haemodynamics (Hackman et al. 1999, prospective cohort [-]; Ogburn et al. 1999, prospective cohort [+]; Schroeder et al. 2002, prospective cohort [+]; Oncken et al. 1997, randomised cross-over trial [+]; Wright et al. 1997, prospective cohort [+])

ES 3.2 There is strong evidence that oral NRT products deliver less nicotine than smoking and have smaller or no effect on foetal haemodynamics (Lehtovirta et al 1983, non-randomised trial [-]; Lindbald & Marsal 1987, randomised cross-over trial [+]; Lindbald et al. 1988, randomised cross-over trial [+]; Oncken et al. 1996, RCT [+]; Oncken et al. 2009, RCT [+])

ES 3.3 There is strong evidence that nicotine clearance is increased during pregnancy (Dempsey et al. 2002, experimental study [++])

ES 3.4 There is moderate evidence that there is minimal systemic uptake of nicotine in breast milk by the breastfed infant (Ilett et al. 2003, prospective cohort [+])

ES 3.5 No trial so far has identified any adverse pregnancy outcomes linked to NRT (Coleman et al. 2012 RCT [++]; Hegaard et al. 2003, RCT [+]; Hotham et al. 2006, RCT [-]; Kapur et al 2001, RCT [-]; Oncken et al. 2008, RCT [+]; Pollack et al. 2007, RCT [+]; Wisborg et al. 2000, RCT [+]; Lassen et al 2010, retrospective cohort [+]; Strandberg-Larsen et al. 2008, retrospective cohort [+])

ES 3.6 There is inconsistent evidence regarding positive effects of NRT on birth weight. Two studies found this (Wisborg et al. 2000, RCT [+]; Oncken et al. 2008, RCT [+]) but four studies found no effect (Gaither et al. 2009, retrospective cohort [-]; Lassen et al 2010, retrospective cohort [+]; Pollack et al. 2007, RCT [+]; Hegaard et al. 2003, RCT [+]).

ES 3.7 There is weak evidence that babies born to mothers who used NRT during pregnancy have an increased risk of musculoskeletal abnormalities compared to babies born to non-smokers (Morales-Suarez-Varela et al. 2006, retrospective cohort [+]). The prevalence of musculoskeletal malformations was higher in children of NRT users (14/250, 5.6%) compared to non-smokers (1242/55,915, 2.2%), RPR=2.6, (CI: 1.53-4.52). When only major musculoskeletal malformations were considered, there was no significant difference (2.4% vs. 1.2%, RPR=2.05 (95% CI: 0.91–4.63). The findings are difficult to interpret because no comparison was made between NRT users and smokers not using NRT and the numbers of NRT users are so small. Data from high quality study (Coleman et al. 2012 [RCT ++]) failed to show any association between NRT use and congenital abnormalities.

ES 3.8 There is moderate evidence that babies born to mothers who used NRT during pregnancy had an increased risk of cryptorchidism compared to babies born to non-smokers (Damgaard et al. 2008, prospective cohort [+]). Smoking was not found to be a risk factor.

However the study does not provide a comparison between smokers who did and smokers who did not use NRT, so the effects of smoking cannot be differentiated from any effects of NRT.

DISCUSSION, GAPS AND RESEARCH RECOMMENDATIONS

The review concerned two main clinically relevant issues. The first is whether there are any populations or circumstances where NRT use may be unsafe; and the second is whether there are any populations or circumstances where acute tobacco abstinence may be unsafe.

Regarding the safety of NRT, the review did not identify any safety concerns related to its use for stopping smoking in cardiac patients or in any other group of secondary care users. No concerns were raised about NRT safety in mental health service users either, although it may not be effective in this population. Regarding pregnancy, any risks associated with NRT use are much smaller than those associated with smoking, and may be clinically negligible. Nevertheless, given uncertainty about NRT efficacy in pregnant smokers and the possibility that it is not totally harmless, there is a need for research into the safety and efficacy of other treatments such as varenicline.

The review identified one area of NRT use that does raise concerns. It seems that in some hospitals it became a common practice to put NRT patches on ICU and surgery patients deemed to present a risk of delirium. There is little evidence that tobacco deprivation contributes to delirium. There is also no evidence that NRT patches help and there is some evidence that they may be harmful in several ways, although some of these the finding are likely to be due to patient selection. No controlled trial has examined this issue. This represents a gap in evidence that would be relatively easy to fill.

Regarding effects of acute tobacco abstinence, this may affect comfort of some hospitalised patients, and it increases systemic levels of a number of medications. This is of particular relevance to patients hospitalised in psychiatric hospitals. E.g. patients on olanzapine are likely to experience a significant weight gain and increased risk of diabetes due to their medications. When hospitalised and prevented from smoking, they are at risk of further weight gain due to tobacco withdrawal and some additional weight gain and other, potentially serious, adverse effects from an increase in systemic olanzapine levels. A recommendation should be considered for routine lowering of dosing in all smokers on these medications admitted to smoke-free wards.

There is one relevant area where more evidence is needed, concerning the timing of quit attempts in people undergoing treatment for drug and alcohol dependence. It is currently not known whether stopping smoking during such treatments facilitates or undermines drug and alcohol sobriety or has no effect on it.

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METHODOLOGY

RATIONALE FOR THIS REVIEW

Each year thousands of smokers are admitted to secondary care settings in the United Kingdom (UK) for treatment of smoking related diseases. For many of these people the admission and the illness represents a prompt for stopping smoking, and brings them into contact with health care professionals who can help. Even for smokers who are not ready to quit, assistance may be required to help them abstain whilst in a smokefree environment.

Nicotine replacement therapy (NRT) is the most commonly used smoking cessation treatment in the secondary care setting, where it is effective in alleviating the symptoms of tobacco withdrawal and increases the chances of long-term abstinence (Stead, Perera et al. 2008). Traditionally NRT has been used only for smoking cessation, but more recently its use has been extended to assist smoking reduction and temporary abstinence and this further increased its usefulness.

Although NRT has a good safety profile, there remains some concern about the safety of nicotine, especially in groups such as pregnant women and patients with cardiovascular disease. These concerns are common both among smokers and among healthcare professionals. One concern is the incorrect belief that nicotine is the main component in tobacco smoke responsible for illness. Many smokers believe that NRT products are just as likely as cigarettes to cause smoking related disease (Bansal, Cummings et al. 2004; Shiffman, Ferguson et al. 2008). There is general agreement among experts that it is not nicotine that causes the adverse health effects associated with smoking. However health risks associated with nicotine cannot be ruled out completely. There are some data that suggest that nicotine might have adverse effects in pregnancy (Bruin, Gerstein et al. 2010) and other concerns focus on the cardiovascular system.

Abstinence from smoking can result in adverse effects such as those associated with tobacco withdrawal (e.g. irritability and depression) and changes in plasma levels of some medications. Smoking tobacco causes induction of the liver enzyme cytochrome P450 (CYP1A1, CYP1A2) (Zevin and Benowitz 1999). This is mainly the effect of the polycyclic aromatic hydrocarbons present in tobacco smoke. CYP1A2 is responsible for the breakdown of several medications (e.g. clozapine) and medications metabolised by this enzyme will be metabolised faster in smokers than in non-smokers. On a person's cessation of smoking these enzymes return to a normal level of activity that can result in a change in metabolism of several medications. Subsequent dosage adjustments may be necessary to avoid over-medication.

Smokers with mental health illness are of particular interest in this context. They often use medicines that are affected by smoking and may cause dangerous side effects in users who decide to or are forced to abstain from smoking. There is also a fairly widespread belief that their mental health may also be affected by the use and withdrawal of tobacco and/or nicotine.

In summary, the issues above concern three main groups of smokers: Those hospitalised with physical illness, smokers hospitalised with mental illness, and pregnant smokers. We review the available evidence concerning these three groups in three separate chapters.

Aim

The aim of this review is to ascertain the effects of nicotine intake or changes in levels of nicotine intake including nicotine from tobacco, on the mental and physical health of people using secondary care services; and on pregnant women and the foetus. We shall cover these effects separately for smokers hospitalised with physical illness, smokers with mental illness, and pregnant smokers.

Research questions

This review aims to answer the following three questions posed by NICE:

Question 1: What are the effects of nicotine intake, or changes in levels of nicotine intake, on the mental and physical health of people using secondary care services who are on medication?

Question 2: What are the effects of tobacco consumption, or changes in tobacco consumption, on the mental and physical health of people using secondary care services who are on medication?

Question 3: What are the effects of nicotine intake, or changes in levels of nicotine intake, on the mental and physical health of people using secondary care services?

Structure of this review

We have structured this review in a pragmatic and logical way that addresses the three main populations: (1) users of general secondary care services, (2) mental health service users and (3) pregnant women. This is because each of these three groups generates clinically important questions concerning nicotine use and tobacco withdrawal, which are specific to them and not relevant to the other two groups. Each population with its set of relevant issues is covered in a separate Chapter.

The key topics covered in this review are safety of medicinal nicotine and of nicotine deprivation in hospital patients (both in those who are medically stable and acutely unwell), the effects of smoking status on medications, the effects of nicotine deprivation on psychiatric symptoms in mental health service users, and the safety of medicinal nicotine in pregnancy.

Groups that are covered in this review

This review includes evidence from studies of the following people of all ages who use tobacco (smoked or smokeless):

- Patients and users of acute and maternity services, including those who are in the process of being referred to hospital or have recently been discharged;
- Patients and users of secondary care mental health services, including those who are in the process of being referred to or have recently been discharged from:

- Child, adolescent, adult and older people mental health services; and
- Inpatient, residential and long-term care for severe mental illness in hospitals, psychiatric and specialist units and secure hospitals.

ISSUES NOT COVERED IN THIS REVIEW

This review does not consider evidence relating to long-term effects of tobacco use and of stopping smoking on health. This is a very broad area outside the scope of this review that focuses on safety issues related to acute abstinence and to use of NRT.

The review also does not cover the efficacy of NRT in alleviating tobacco withdrawal and in helping smokers quit. This is covered in review 2.

SEARCH METHODOLOGY

The evidence base for this review was sourced from reviews and trials published between 1980[2] and December 2011 in the English language. The searchable databases included ASSIA, MEDLINE, Cochrane Central Register of Controlled Trials, CINAHL and PsychINFO (a full list of the databases searched is included in the review protocol in Appendix 1). Several websites were also searched for relevant data these included NHS Centre for Smoking Cessation and Treatment, Action on Smoking and Health (ASH), Treat tobacco.net and WHO Tobacco Free Initiative (a full list of websites searched is included in Appendix 1). A systematic search of the grey literature was not undertaken but hand searching of bibliographies of systematic reviews that met the inclusion criteria was carried out to ensure that relevant data was included in this review.

The main search strategy combined terms relevant to capture evidence on the effects of nicotine use, or withdrawal in secondary care patients.

The search strategy was developed to capture all relevant data for the review (see appendix 1 for search terms used).

The following studies were considered for the review:

- Quantitative studies (both experimental and observational studies, including case studies);
- Qualitative studies;
- Systematic reviews, reviews, reviews of reviews; and
- Information that addresses the review questions.

[2] Some papers with a publication date prior to 1980, recommended by the NICE PDG, have been included post-database search

SEARCH RESULTS

Searches of the databases returned 21,400 records. After duplicates were removed a total of 10,466 titles and abstracts were screened. Full papers were also obtained where there was no abstract and the relevance could not be assessed by the title alone. One member of the project team screened all titles and abstracts and a second member of the team re-screened to check accuracy. Of the total number of abstracts 192 (1.8%) required review from a third member of the project team as to whether they should be included in the review. A total of 442 papers were identified for full text retrieval. A flow diagram illustrating the screening procedure is included in

Figure 1 below. Studies excluded at the full-paper screening stage are listed in the appendix 2, along with a brief reason for exclusion. Each of the included studies was rated ('++', '+' or '-' – see Table 1) to indicate its quality. Data from included studies were extracted into evidence tables. The quality of the included trials and reviews was assessed using criteria outlined in NICE guidance.

Table 1: Quality assessment ratings

++	All or most of the checklist criteria have been fulfilled; where they have not been fulfilled the conclusions are very unlikely to alter.
+	Some of the checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter.
–	Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

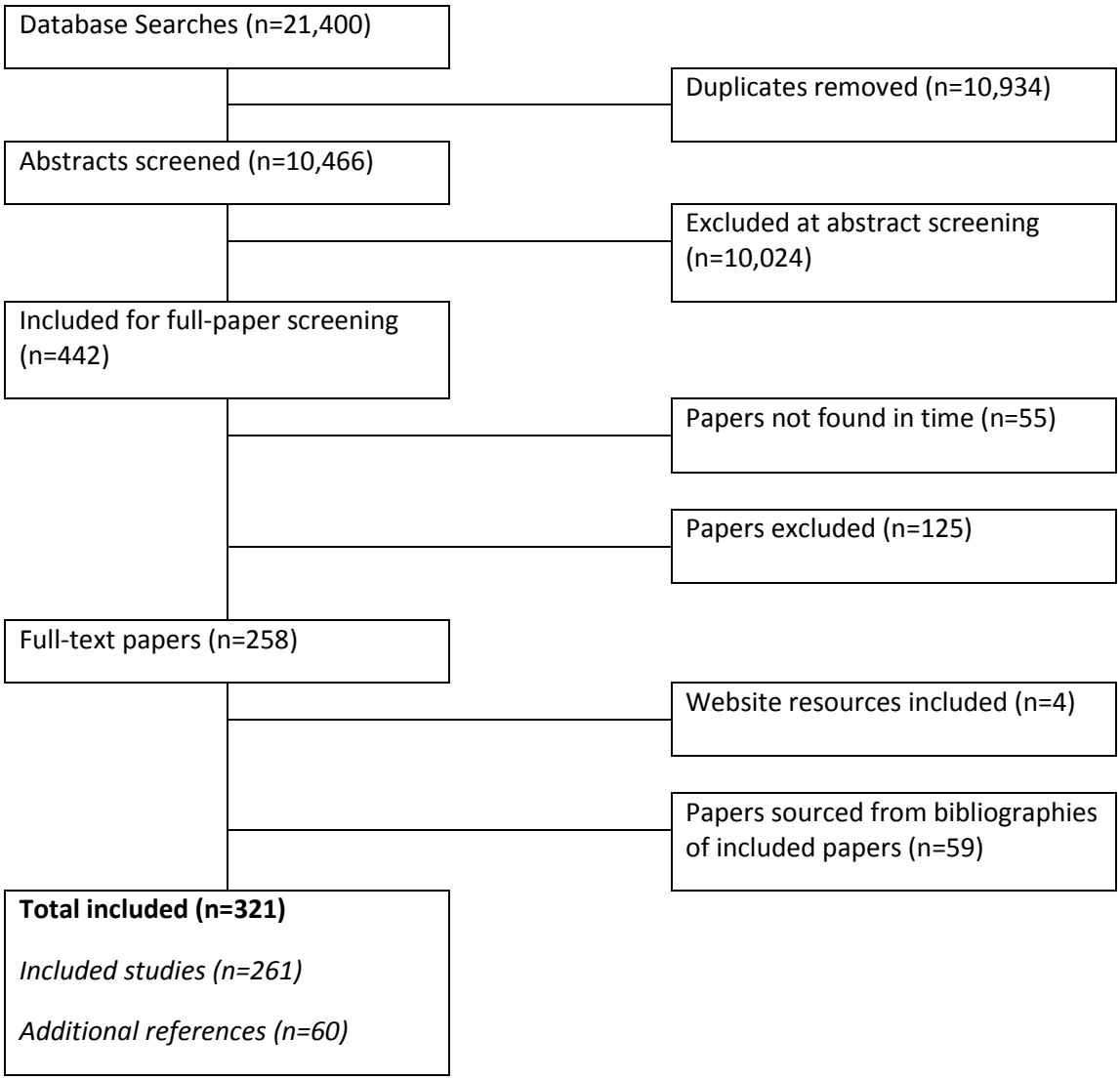
Regarding individual studies, studies with serious methodological problems and most case studies were marked as -, well conducted RCTs with representative samples were marked as ++, and the remaining studies were marked as +.

EVIDENCE STATEMENTS

Evidence statements used in this review contain a descriptor, strength, and direction of the evidence. The strength of evidence was classified as:

- No evidence
- Inconsistent evidence (studies with contradictory results)
- Weak evidence (one or more studies but none scores [+] for quality)
- Moderate evidence (one or more studies, where at least one scores [+] for quality and the results are consistent).
- Strong evidence (two or more studies, where at least two score a [+] for quality; or at least one study which scores (++) for quality, and the results are consistent)

Figure 1: Flow diagram for papers



CHAPTER ONE

Effects of nicotine and of acute tobacco withdrawal in hospitalised patients

Introduction

We identified 101 studies seeking to determine the health effects of nicotine, primarily nicotine delivered via NRT, and the effects of abstinence from tobacco on hospitalised smokers. Patients with mental health illness are covered in Chapter 2.

We organised the material addressing one or more aspects of this wide and varied field into the parts and sections structure to allow consideration of manageable volumes of evidence concerning distinct clinical issues.

1. Part 1 concerns cardiac patients
2. Part 2 concerns intensive care unit (ICU) and surgery patients
3. Part 3 concerns all other hospital patients

A brief interpretative summary of findings is provided at the end of each section, and evaluation and evidence statements are at the end of the Chapter.

Part 1: Effects of nicotine in patients with cardiovascular disease

Next to pregnant women, patients with cardiovascular disease (CVD) are considered the group of health service users most sensitive of any potential harm from NRT. There are also concerns about the effect of stopping smoking on metabolism of some CVD drugs.

This part includes 3 sections. Section 1 covers acute effects of nicotine on the cardiovascular system; Section 2 is covering effects of NRT used over extended period of time for smoking cessation; and Section 3 covers the effects of smoking and of tobacco abstinence on CVD medications.

Section 1: Studies of acute effects of NRT

We found eight experimental studies examining acute effects of NRT on the cardiovascular system.

Table 2 summarises the studies included in this section.

Table 2: Summary of studies included in part 1 section 1

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Benowitz et al (1993)	Randomised placebo controlled cross-over trial	USA 12 male smokers allocated to three 5-day treatment blocks (smoking 22 cpd, 21mg patch, and placebo patch).	Urine concentration of thromboxane B2 (TXB2), blood samples and platelet aggregation.	Smoking was associated with significantly greater excretion of TXB2, higher levels of plasma fibrinogen.	Quality +
Gembala et al (2006)	Non-randomised controlled trial	USA 27 healthy subjects allocated to smoking a single cigarette or to chew a piece of 4mg gum after overnight abstinence.	Left ventricular diastolic function assessed on an echocardiogram.	Only cigarette smoking was associated with acute, but non-significant, changes in LV diastolic function.	Quality +
Goldsmith et al (1989)	Prospective cohort study	USA 11 patients (2 smokers) with congestive heart failure and 8 healthy subjects (1 smoker) chewed a piece of 2mg gum over an hour.	Heart rate (HR), mean arterial pressure (MAP), plasma noradrenaline (NA) and nicotine.	Healthy subjects showed a significant increase in HR and plasma NA after 45 minutes. Heart failure patients showed no significant change in plasma NA.	Quality -
Kelley et al (1996)	Randomised placebo controlled trial	USA 19 smoking patients referred for evaluation of chest pain used nicotine nasal spray (n=14) or placebo spray (n=5) after smoking a single cigarette.	Coronary cineangiography and plasma nicotine levels.	Only smoking the first cigarette was associated with increased heart rate and a change in coronary artery diameter.	Quality +
Leja et al (2007)	Randomised placebo controlled trial	USA 55 smokers with coronary artery disease (CAD) received 21mg patch or placebo whilst smoking for a week, and then trying to abstain for 3 weeks.	Myocardial perfusion defect measured after an exercise test, blood nicotine levels and CO in expired breath.	No significant differences were seen in total perfusion defect between patch and placebo.	Quality +
Mahmarian et al (1997)	Prospective cohort	USA 40 patients with CAD were given 14mg patches for 3 days and then 21mg patches for 3 days, and asked to stop smoking.	Changes in perfusion defect and time to ST segment depression on ECG. CO in expired breath and serum nicotine and cotinine levels.	In patients using patches showed the total perfusion defect size decreased (improved) from baseline and time to ST depression significantly increased (improved) from baseline.	Quality +
Nitenberg et al (1999)	Controlled trial	France 17 ex-smokers undergoing diagnostic coronary angioplasty. A cold-pressor test given without and with chewing 4mg nicotine gum for 30 minutes.	Diastolic and systolic aortic blood pressures and cross sectional area of normal and stenosed coronary arteries.	Cold pressor test increased blood pressures and decreased cross-sectional area of both normal and diseased arteries; the gum had no additional effect.	Quality +
Tanus-Santos et al (2001)	Single blind, placebo controlled	Brazil 9 healthy non-smoking controls, 10 normotensive	MAP, heart rate, plasma TXB2 levels were measured.	The patch caused a significant increase in MAP in normotensive smokers	Quality +

	cross over trial	smokers, and 10 hypertensive smokers. Admitted to a research unit on 2 different days and randomised to 21mg patch or placebo.		and controls. No significant changes seen in the hypertensive smokers.	

Benowitz et al. (1993, RCT, [+]) studied 12 healthy male smokers admitted to a research ward for a total of 16 days and allocated to three 5-day treatment blocks. The treatment blocks were to smoke 22 cigarettes per day, to wear a 21mg patch or to wear a placebo patch. At 24-hours, AUC values for nicotine concentrations were 451+/- 62 ng/ml in the smoking condition and 357+/- 30 ng/ml on the patch (NS). Smoking was associated with significantly greater excretion of TXB2 and higher levels of plasma fibrinogen than both nicotine and placebo patch, and the patches did not differ. Nicotine does not appear to cause an increase in platelet activation and fibrinogen. Although this study did not examine the effects of patches in people with CVD, the results suggest that any risk associated with patch use is outweighed by the risks of continued smoking.

Gembala (2006, non-randomised CT, [+]) studied 27 healthy subjects (most were ex-smokers) self-assigned to smoking a single cigarette or to chewing a piece of 4mg nicotine chewing gum after overnight abstinence from smoking. Prior to smoking or gum use participants had an echocardiogram, which was repeated immediately after smoking and 15 minutes after administration of the gum. All subjects had normal LV diastolic function. Cigarette smoking was associated with acute changes in LV diastolic function that were in the direction of impaired relaxation (although this was not clinically significant). Gum use had no effect on LV diastolic function.

Goldsmith (1989, prospective cohort, [-]) recruited 8 healthy subjects (1 smoker), and 11 patients with congestive heart failure (2 smokers) to examine the effects of chewing 2mg nicotine gum for an hour. Healthy subjects showed a significant increase in HR and plasma noradrenaline at 45 minutes ($p<0.01$). Heart failure patients showed a non-significant change in heart rate and plasma NA. Both groups showed a small rise in mean arterial pressure, but this was only significant in the heart failure group at 45 minutes after gum use (increased from 85 +/-10 mmHg to 91+/-13 mmHg, $p<0.05$). The results are difficult to interpret because the majority of subjects were non-smokers.

Keeley (1996, RCT, [+]) randomised 19 smokers referred for cardiac catheterisation to receive either the nicotine nasal spray (N=14) or placebo nasal spray (N=5). After overnight abstinence participants smoked a cigarette. A 20-minute 'washout period' was allowed before the procedures were repeated with the nasal spray. Another cigarette was smoked 5 minutes after the nasal spray was used. Coronary cineangiography and plasma nicotine levels were taken at baseline and 5 minutes after each cigarette and nasal spray. Smoking the first cigarette, but not nicotine spray or second cigarette, increased heart rate. Smoking resulted in a significant increase in blood nicotine (4 +/- 2 to 18 +/- ng/ml, $p<0.0001$). The increase in blood nicotine after use of the nasal spray did not reach significance (9 +/- 2 to 15 +/- 2). Smoking the first cigarette was the only condition associated with a significant change (-5% +/- 2, $p=0.009$) in coronary artery diameter. The spray seems to have delivered little nicotine, but a 5-minute post-use interval may have been too short. With this proviso, the results can be interpreted as showing that using nicotine spray while smoking did not generate any safety concerns in CVD patients.

Leja (2007, RCT, [+]) randomised 55 smokers with coronary artery disease to either 21mg or placebo patch whilst continuing to smoke for a week. Patch use was associated with a significant increase in blood nicotine levels (p=0.01) and a decrease in CO (p=0.02) at week 1. No significant differences were seen in total perfusion defect between nicotine patch and placebo patch groups (25+/-16 to 23 +/- 15 for patch and 21 +/- 10 to 17 +/- 10 for placebo, p=0.37).

Mahmarian (1997, prospective cohort, [+]) studied 40 patients with CAD who were given 14mg patches for 3 days and then 21mg patches for a further 3 days. Whilst wearing patches patients were asked to stop smoking. Carbon monoxide levels and cigarette consumption both showed significant decrease from baseline, whilst nicotine levels increased (15.8 +/- 8.3 to 24.2 +/- 12.0 to 30.4 +/- 10.8 ng/ml), p<0.001. Time to ST depression significantly increased from baseline (352 +/- 132 s) when on the 14mg patch (436 +/- 121 s) and 21mg patch (417 +/- 133 s), p<0.01. Total perfusion defect size decreased from baseline (17.5% +/- 10.6) on 14mg (12.6 +/- 10.1) and 21 mg patches (11.8 +/- 9.9), p<0.001. These were beneficial effects, most likely due to smoking reduction.

Nitenberg (1999, controlled trial, [+]) investigated 17 ex-smokers undergoing diagnostic coronary angioplasty. A baseline coronary arteriography was undertaken followed by a cold pressor test (sympathetic stimulation). The same procedure was undertaken after the patient had chewed one piece of 4mg nicotine gum for 30 minutes. The cold pressor test increased blood pressure; however the gum had no additional effect. No significant changes were observed in heart rate (HR) in either condition. The cold pressor test resulted in a significant decrease in cross-sectional area of both normal and diseased arteries (p<0.0001). The gum had no additional effect.

Tanus-Santos (2001, controlled cross-over trial, [-]) studied 9 healthy, non-smoking controls, 10 normotensive smokers, and 10 hypertensive smokers. Participants were admitted to a research unit on 2 different days and randomised to 21mg or placebo patch. There was a significant (p<0.05) increase in mean arterial pressure (MAP) and HR and in plasma thromboxane B2 levels in the non-smokers control group, 30-60 minutes after applying the patch. There was also a significant increase in MAP in the normotensive smokers from 2-4 hours after application of the patch. There were no significant changes in the hypertensive smokers.

INTERPRETATION

In laboratory studies involving several different NRT formulations (4 studies of patches, 3 of oral NRT and 1 study of nicotine nasal spray), acute effects of NRT on cardiovascular parameters were weaker than effects of smoking. Where participants smoked and used NRT during the same time period, NRT use did not contribute any additional negative effects. No signal of risk that would require further investigation has emerged.

SECTION 2: STUDIES OF EFFECTS OF NRT USED TO STOP SMOKING

Given the NRT is often used routinely with cardiac patients, and a number of NRT trials were conducted in this population, there is now a volume of data relevant for considering safety of such 'real life' use of NRT over an extended period of time.

We found five experimental studies, one systematic review, four observational studies, and four case studies. They are summarised in Table 3.

Table 3: Summary of studies included in part 1 section 2

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Allen et al (1994)	Randomised placebo controlled trial	USA 935 healthy smokers given patches 21mg, 14mg, 7mg, or 0mg for 6 weeks.	BP, HR, weight, and fasting total cholesterol, HDL-C, LDL-C and triglycerides.	Abstainers (n=432) in all groups had a significant decease in HR, systolic BP, and LDL-C, and increased HDL-C.	Quality ++ Healthy population
Dacosta et al (1993)	Case study	France 34-year-old male smoker (20-40 cpd for 14 years).	Developed chest pain when using a 21mg patch during a quit attempt.	Diagnosed with acute myocardial infarctions (MI).	Quality -
Greenland et al (1998)	Systematic review	Data from 35 clinical trials of 5501 subjects receiving nicotine patch and 3752 subjects receiving placebo patch	Adverse events associated with patch use	Patch use showed no statistically significant increase in risk of CV AEs compared with placebo.	Quality ++ Healthy population
Hubbard et al (2005)	Retrospective cohort study	UK 33,247 smokers that had used NRT identified from a UK general practice database.	Incidence of myocardial infarction, stroke and mortality 56 days before and after using NRT	861 patients had a MI and 506 had a stroke. No link to NRT	Quality +
Joseph et al (1996)	Randomised double blind placebo controlled trial	USA 584 outpatients with CVD given 10-week course of 21mg nicotine patch or placebo	CO validated abstinence and adverse events	Significantly more SAEs in the placebo group. Quit rates higher in the nicotine group.	Quality ++
Kimmel et al (2001)	Case control study	USA 653 current or recent (smoking within the last year) smokers admitted with first MI. Controls were smokers without MI interviewed via telephone.	Patch use within 1 week of hospital admission (cases) or telephone interview (controls)	No association between patch use and MI. Smoking concurrently with patches did not increase risk compared with smoking alone.	Quality + Few smokers reported using a patch
Marsh et al (2005)	Randomised open label trial	USA 901 patients with heart disease given 4mg lozenge or 4mg	Adverse events	SAEs were similar in the lozenge and gum groups.	Quality +

		gum.			
Meine et al (2005)	Case control study	USA 991 hospitalised patients with unstable angina undergoing cardiac catheterisation. Nicotine patch users (n=187) were matched with non-patch users (n=187)	7-day, 30-day and 1-year mortality.	No differences between patch users and non-patch users in deaths at any time point	Quality +
Ottervanger et al (1995)	Case study	Netherlands 39-year-old man, smoking 50-100 cigarettes per day, suffered acute MI 20 days after starting a patch.		Exercise stress test and coronary angiogram several weeks after discharge was normal.	Quality -
Ropchan et al (1997)	Case study	Canada 33-year-old women. Quit smoking using nicotine patches. Developed chest pain after 3 days.	Pain resolved when patch removed and returned when reapplied	Subsequently found to have a dissected aortic aneurism.	Quality -
Tzivoni et al (1998)	Double blind randomised placebo controlled trial	Switzerland 106 patients with CAD given 2-week course of 21mg nicotine patch or placebo	ECG monitoring and exercise testing.	No difference in ischemic episodes.	Quality +
Warner and Little (1994)	Case study	USA 47-year-old male smoker, history of inferior AMI. Stopped smoking on nicotine patch.	After a week smoked one cigarette while on patch, developed chest pain	Diagnosed with n MI caused by subtotal occlusion of the proximal left anterior descending artery.	Quality -
Willmer and Bell (2003)	Retrospective audit	UK 42 patients, post acute MI, enrolling in a smoking cessation service. 76% used NRT.	Adverse events and abstinence (CO validated) at 12 month follow-up	No reported adverse events and 64% self-reported (CO validated) abstinence at 12 months.	Quality -
Working Group for Study of Transdermal Nicotine in Patients with CAD (1994)	Randomised double blind placebo controlled trial	USA 156 patients with stable CAD given nicotine patch (14mg/24hrs) or placebo.	Self reported cardiac symptoms; ECG, BP and HR. Blood samples for chemistry, haematology, nicotine and cotinine.	No differences in angina attacks, ECG or blood results.	Quality ++

EXPERIMENTAL STUDIES

The first study reported here concerned healthy subjects, but it is included because of its specific focus on cardiovascular effects of NRT.

Allen et al. (1994, RCT [++]) randomised 935 healthy smokers (without CVD) to use one of four different nicotine patch strengths (21mg, 14mg, 7mg, 0mg) for 6 weeks to investigate the effects of abstinence and nicotine use on risk factors for CVD. 432 participants achieved abstinence and 254 continued to smoke. Abstainers in all groups experienced a decrease in heart rate, systolic blood pressure, and LDL, and an increase in HDL and triglycerides. There was a greater weight gain and decrease in heart rate on placebo than on 21mg patch.

Joseph et al (1996, RCT [++]) randomised 584 outpatients with CVD (40% had a history of myocardial infarction) to a 10-week course of 21mg nicotine (N=294) or placebo patch (N=290). The following serious adverse events were reported in the nicotine and placebo group: Death 1 vs. 6; AMI 0 vs. 1; Cardiac arrest 1 vs. 1; Admission for worsening angina 7 vs. 10; Admission for arrhythmia 5 vs. 3; Admission for congestive heart failure 2 vs. 2. At the end of treatment a total of 16 in the nicotine group (5.4%) vs. 23 in the placebo group (7.9%), (p=0.23) had reported a serious adverse event (SAE). There was no significant difference in reporting of secondary endpoint SAEs: 35 (11.9%) vs. 28 (9.7%), p=0.37. If SAEs are only considered in abstainers then total SAEs in the nicotine vs. placebo group were 19 (6%) and 9 (3%), significance levels were not reported. Abstinence rates at 14 weeks were significantly higher in the nicotine group (21%) versus the placebo group (9%), p=0.001. The results indicate good safety profile of NRT in CVD patients.

Marsh et al (2005, RCT [+]) randomly allocated 901 patients with cardiovascular disease or diabetes to a 12 weeks course of 4mg lozenge (N=447) or 4mg gum (N=454). SAEs were similar in the lozenge (11/447) and gum (13/454) groups. There was no difference in the proportion of AEs by amount and duration of product use. The majority of patients (>60%) had no change in their condition over the course of the study. Less than 5% reported a worsening of their CV condition with the remainder showing an improvement. Overall gum and lozenge were well tolerated and AEs were similar in type and frequency to those seen in smokers without CV illness.

Tzivoni et al (1998, RCT [+]) randomised 106 patients with coronary artery disease to receive a 2-week course of 21mg nicotine patch (N=52) or placebo patch (N=54). No differences were seen in the number of patients with at least one ischemic episode between nicotine and placebo groups after patch was started (13 vs. 16) and at 2 weeks (16 vs. 12). Two patients in the patch group had worsening angina compared to one in the placebo group. There were also no significant changes from baseline in exercise testing between the groups.

Working Group for the Study of Transdermal Nicotine in Patients with Coronary Artery Disease (1994, RCT [++]) randomised 156 smokers with stable coronary artery disease (CAD) to nicotine patch (14mg/24hrs) (N=77), or placebo patch (N=79). Patients needing more help had the option of increasing the patch doses to 21mg. Four-week abstinence rates were higher in the nicotine patch group (36% vs. 22% p<0.05). The rates of withdrawal from the study due to adverse events did not differ between the groups (3 in the patch group and 8 in the placebo group, p=0.13). There was no significant difference in the number of patients reporting angina attacks, in ECG findings, blood chemistry or haematology.

OBSERVATIONAL STUDIES

Hubbard et al. (2005, Retrospective cohort [+]) identified 33,247 smokers prescribed NRT from a UK general practice database. 861 had an MI and 506 had a stroke. There was a progressive increase in the incidence of first MI incidence in the 56 days before the first NRT prescription (IR=5.55, CI 4.42-6.98), but no increase in the 56 days after starting NRT (IR=1.27, CI 0.82-1.97). The results were similar for second MI and for stroke. There were 960 deaths during 2.6 years after starting NRT, with no evidence of increased mortality in the 56 days after NRT prescription (IR=0.86, CI 0.60-1.23). The study shows on a very large sample that NRT does not cause AMI and stroke.

Kimmel et al (2001, Case control [+]) studied 653 current or recent smokers admitted to hospital with their first MI and a control group of 2,990 smokers without any history of AMI recruited via random dialling. Data on MI patients' patch use within 1 week of admission was collected from patient charts. Telephone interviews were used to collect data from the control group. In the MI group vs. no MI group, 3/653 and 30/2990 respectively, reported using a nicotine patch. There was no significant association between patch use and MI (OR=0.46, 95%CI:0. 09-1.47). The results remain the same when baseline characteristics were included as potential confounders. Smoking concurrently with patches did not increase the risk of an MI compared with smoking alone (OR=0.83 95%CI: 0.09-3.81, p=1.0).

Meine et al (2005, Case control [+]) followed up patients who were admitted for unstable angina and who underwent cardiac catheterisation (N=991) identified from a hospital database. Patch use (n=194) was ascertained from pharmacy records. Propensity matching was used to match individuals from the NRT group with the non-NRT participants, generating a cohort of 187 NRT users and 187 non-NRT users. There were no significant differences between NRT and non-NRT groups in the number of deaths at 7 days (1 vs. 0), 30 days (3 vs. 2) or 1 year (10 vs. 9). Additionally there were no differences in the numbers needing coronary artery bypass surgery (26 vs. 37) or coronary angioplasty (79 vs. 94).

Willmer and Bell (2003, retrospective audit, [-]) audited 42 patients with a diagnosis of myocardial infarction approached whilst enrolling in a smoking cessation service. 32 used NRT, mostly patch (n=31). 27 (64%) were CO validated as being abstinent at 12 months. There were no adverse events.

CASE STUDIES

Dacosta et al (1993, case study, [-]) reported the case of a 34 year old smoker using 21mg patch to stop smoking. Several hours after applying the patch he felt unwell with chest pain. This occurred throughout the day and then disappeared. He continued to smoke intermittently whilst on the patches. The pain returned two weeks into patch treatment and the diagnosis of a latero-apical infarction was made. He was subsequently found to have a thrombus of the left anterior descending artery.

Ropchan et al (1997, case study, [-]) reported a case of a 33-year-old female smoker who made a quit attempt using a 20mg patch and after three days developed chest pain. The patch was removed and the pain resolved. After two weeks she reapplied the patch on two mornings as part of another quit attempt and the pain returned on the second day of patch use. She was subsequently found to have a dissected aortic aneurism.

Ottervanger et al (1995, case study, [-]) reported the case of a 39-year-old man, who was smoking 50-100 cigarettes per day. The man suffered an AMI, 20 days after starting the patch treatment. A cardiac catheterisation had occurred two years earlier (attributed to a post traumatic injury) but he showed no evidence of coronary artery disease. ECG on

admission to hospital showed acute transmural inferior MI. Exercise stress test and coronary angiogram conducted several weeks after discharge all showed normal results.

Warner and Little (1994, case study, [-]) reported on a 47 year old male smoker with a history of an MI using a 21mg nicotine patch to stop smoking. After a week he smoked one cigarette while still using the patch, and developed chest pain. He was diagnosed with an MI caused by subtotal occlusion of the proximal left anterior descending artery.

SYSTEMATIC REVIEWS AND OTHER REVIEWS

Greenland et al (1998 systematic review [++]) analysed data from 35 trials of 5501 subjects receiving nicotine patches and 3752 subjects receiving placebo patches. These were not trials of hospital patients or patients with cardiac disease, but the review is relevant for our topic because it collated all adverse events associated with nicotine and placebo patch use, including cardiovascular outcomes. Patch use was associated with no increased risk of CV events compared with placebo patch use. Individual findings were as follows for patch vs. placebo: MI 3/360 vs. 3/362; stroke 1/354 vs. 2/357; tachycardia 2/239 vs. 0/238; palpitations 2/446 vs. 8/451; angina 1/239 vs. 1/238; arrhythmia 11/406 vs. 9/441; hypertension 8/354 vs. 5/357.

Ten papers provided general reviews (not summarised in the tables) of the effects of nicotine replacement therapy in patients with cardiovascular disease (Joseph 1996; Benowitz & Gourlay 1997; Pisinger et al 1999; Balfour et al 2000; McRobbie & Hajek 2001; Joseph & Fu 2003; Ford & Zlabek 2005; Ludvig et al 2005; Galen et al 2011; Pipe et al 2011). All agree that the benefits outweigh any risks

INTERPRETATION

Most studies focused on nicotine patches. Among the various NRT products, patches provide the highest nicotine levels and in the 24-hour form, they can provide nicotine overnight and occasionally in excess of smoking levels. Of the eight studies examining the acute effects if NRT, four studied the effects of patches, three studied oral and one nicotine nasal spray. The nasal spray is a product that provides the most rapid increase in blood nicotine levels and so might be assumed to result in a greater effect on cardiovascular parameters. However smoking the first cigarette, but not nicotine spray or second cigarette, increased heart rate suggesting that using nicotine spray even while smoking does not generate any safety concerns in CVD patients.

In studies following smokers with CVD using NRT (the majority were patch studies) or placebo for a protracted period of time, there were no differences in adverse events or changes in CVD between patients on NRT and patients on placebo. No randomised trial found any signal of risk. This provides the best available evidence on safety of NRT in this patient group.

Three cohort studies found no link between NRT use, MI and stroke.

Four case studies report cardiac events occurring in smokers using NRT. It is worth noting that all four concern patches rather than any of the short acting NRT products. Patches are the only NRT product that media linked to cardiac events. A very large number of cardiac incidents occur daily and they will coincide with practically any activity and medication.

Randomised trials found no difference between cardiac events on patches and on placebo, but of course a rare causal effect cannot be ruled out.

A systematic review, which included studies reporting cardiovascular events following NRT or placebo use in healthy populations, which were outside the brief of this review, showed that NRT does not cause adverse cardiovascular events in healthy users. A number of commentaries agree that benefits of NRT outweigh any risks.

Overall, there is no evidence suggesting that NRT use is unsafe for people with CVD. Of course it cannot be said that NRT is 'safe', but data evidence shows that its use is associated with less risk than the risks associated with smoking.

Section 3: Effects of stopping smoking on patients' wellbeing and on CVD Medications

We found one study of the aftermath of stopping smoking in patients with MI on their stress levels and 17 studies and reviews of the interactions between smoking and warfarin, an anti-coagulant that is used to prevent thrombosis and embolism in people with atrial fibrillation and artificial heart valves. Table 4 summarises 18 papers included in Section 3.

Table 4: Summary of studies included in section 3

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Hajek et al (2010)	Prospective cohort study	UK 469 smokers hospitalised after MI or bypass surgery given stop smoking advice or usual care	Ratings of perceived stress were measured at baseline and 1-year follow-up	At 1 year stress was reduced among abstainers compared with continued smokers.	Quality +
Aquilante et al (2006)	Prospective cohort study	USA 350 patients who were stable on warfarin	Warfarin dose, smoking history.	Current smoking was associated with a higher prescribed warfarin dose	Quality +
Backman et al (1979)	Prospective cohort study	USA 9 smokers given warfarin for 2 weeks whilst smoking and 2 weeks abstaining	Steady-state plasma levels of warfarin, clearances, half-life, and prothrombin times,	13% increase in plasma warfarin concentration and 13% decrease in clearance. No effect on prothrombin time	Quality +
Evans et al (2005)	Case study	Canada 58-year-old smoker on a stable dose of warfarin admitted to hospital with bacterial meningitis.	Quit smoking on discharge, his INR was 2.0 and he continued on his usual warfarin dose.	Two months after discharge INR increased to 5.5 (outside therapeutic range). Dose was decreased and INR stabilised.	Quality -
Gage et al (2008)	Prospective cohort study	USA 1015 patients on warfarin.	Warfarin dose, smoking history.	Smoking status was an independent predictor of smoking status, with smokers requiring a 10% increase in dose compared to non-smokers	Quality +

Holbrook et al (2005)	Systematic review	Effect of smoking and smoking cessation on warfarin		No evidence of an effect, but limited high quality data	Quality +
Kuykendall (2004)	Case study	USA 34-year-old male smokeless tobacco user with a history of MI and stroke.	Taking warfarin, but it was difficult to achieve a therapeutic INR	In an effort to achieve a therapeutic INR he was asked to stop his tobacco use and in 6 days his INR increased from 1.1 to 2.3.	Quality -
Lee et al (2005)	Prospective cohort study	Hong Kong 63 participants using warfarin (9 smokers).	Stable warfarin requirement	Smoking affected stable warfarin requirements	Quality +
Lenzini et al (2008)	Prospective cohort study	USA Studied 2 algorithms for warfarin dosing in 179 (genetic algorithm) and 233 (clinical algorithm) joint replacement patients	Therapeutic warfarin dose variation.	Current smokers required 14% and 7% increase in warfarin dose using the genetic and clinical algorithms respectively.	Quality +
McGriff-Lee et al (2005)	Retrospective cohort study	USA 350 ambulatory care patients on long-term warfarin and followed in a cardiology clinic	INR within the therapeutic range, smoking history.	Current smoking was not an independent predictor of INR.	Quality +
Millican et al (2007)	Prospective cohort study	USA 92 patients undergoing hip or knee joint surgery	Warfarin dose, smoking history.	Smokers require a 20% increase in dose compared to non-smokers.	Quality +
Mitchell et al (1972)	Retrospective cohort study	USA 230 people (86 non-smokers, 97 light smokers and 47 heavy smokers) on stable warfarin doses.	Mean warfarin dose.	Mean warfarin dose marginally higher in smokers but the difference was not significant.	Quality +
Mungall et al (1985)	Retrospective cohort study	USA Measured warfarin levels in 613 blood samples from 32 adult hospitalized patients and 131 adult outpatients.	Plasma warfarin levels, smoking history.	Compared to non-smokers, smokers had an increased (10%) clearance of warfarin	Quality +
Nathisuwan et al (2011)	Systematic review of 13 studies	Effects of smoking and smoking cessation on warfarin	Percentage change and actual change in warfarin dose	In a meta-analysis of 3 studies, smoking was associated with 12% increase in warfarin dosage	Quality +
Pamboukain et al (2008)	Retrospective cohort study	USA 80 patients with heart failure taking warfarin	INR within the therapeutic range, smoking history.	Tobacco use was associated with a lower INR.	Quality +
The university of Illinois at Chicago (1999)	Case control study	USA 18 smokers and 35 non-smokers receiving a stable dose of warfarin for at least one month	Warfarin pharmacokinetics	There were no significant differences in warfarin pharmacokinetics	Quality +

Weiner et al (1984)	Retrospective cohort study	USA 174 patients (117 non-smokers and 57 smokers) after valve replacement surgery.	Maintenance dose of warfarin	No difference between smokers and non-smokers in daily warfarin dose	Quality +
Whitley et al (2007)	Retrospective cohort study	USA 131 patients attending an internal medicine clinic	Warfarin dose, smoking history.	No effect of tobacco use on warfarin dose	Quality +

Stopping smoking can generate acute discomfort and many smokers also perceive smoking as a helpful strategy for coping with stress. This can create worries about the effects of smoking cessation on patient's wellbeing, especially in CVD patients trying to reduce their levels of stress.

We found one study assessing changes in stress levels in CVD patients who stopped smoking.

Hajek et al. (2010, prospective cohort, [+]) studied 469 smokers hospitalised after a Myocardial Infarction (MI) or after undergoing bypass surgery who received either a brief stop smoking intervention or usual care. Perceived stress was rated at baseline and at 1-year follow-up. At 1-year, ratings of stress were significantly lower among abstainers (N=194) whose stress levels decreased from baseline compared with those who continued to smoke (N=275) whose stress levels did not change. The effect remained significant when other variables were controlled for ($p=0.003$), and in a multivariate analysis including all predictors of abstinence ($p<0.01$).

Stopping smoking can also affect the metabolism of certain drugs. Considerable attention was given to the effects of stopping smoking on levels of warfarin; a widely used anti-coagulant that requires close monitoring to ensure the dose is safe and effective.

We found two relevant systematic reviews. **Holbrook et al (2005, systematic review [+])** reviewed drug and food interactions with warfarin. Most studies were of poor quality. The authors concluded that tobacco use had only a non-clinical effect. **Nathisuwan et al (2011, systematic review [+])** included data published since the Holbrook (2005) review. The authors included 13 studies in their final analyses. Six studies showed no association between smoking and warfarin levels and seven did. The 13 studies are summarised below.

Aquilante et al. (2006, prospective cohort, [+]) assessed the effects of common genetic polymorphisms in 350 patients who were on stable warfarin doses. Data were also collected on other factors. Current smoking was associated with a higher prescribed warfarin dose ($p = 0.0009$).

Bachmann et al (1979, prospective cohort, [+]) studied the effects of smoking and then smoking cessation on plasma warfarin in 9 smokers. A 13% increase in plasma warfarin concentration and a 13% decrease in clearance was observed during smoking cessation. There was no change in prothrombin time.

Gage et al. (2008, prospective cohort, [+]) sought to develop and validate a pharmacogenetic algorithm to aid better dosing of warfarin. Smoking status was an independent predictor of warfarin dose, with smokers receiving a higher prescribed dose (10%) than non-smokers.

Lee et al. (2005, prospective cohort, [+]) examined stable warfarin requirements in 63 Chinese patients using warfarin for at least 3 months. Nine were current smokers. Smoking affected stable warfarin requirements (p=0.001).

Lenzini et al. (2008, prospective cohort, [+]) studied cohorts of 179 and 233 patients undergoing hip or knee joint replacement surgery. 14% and 17% were smokers. The authors' genetic algorithm explained 70% of the therapeutic dose variation, compared to 48% in the clinical algorithm group. Current smokers required 13.7% and 7.4% increase in warfarin dose using the genetic and clinical algorithms respectively. Algorithms are available online at www.warfarindosing.org

McGriff-Lee (2005, retrospective cohort, [+]) looked for predictors of non-therapeutic International Normalized Ratio (INR) in 350 ambulatory care patients on long-term warfarin therapy. Tobacco use was not an independent predictor.

Millican et al. (2007, prospective cohort, [+]) used data from 92 patients undergoing hip or knee joint replacement surgery and on warfarin to develop and algorithm to guide warfarin dosing. Smokers required a 20% increase in dose.

Mitchell et al. (1972, retrospective cohort, [+]) found that smokers were maintained on a higher dose compared to non-smokers, but the difference was not significant.

Mungall et al (1985, retrospective cohort, [+]) analyzed the effects of demographic variables on warfarin plasma concentrations in 163 patients. Smoking resulted in a 10% increase in warfarin clearance.

Pamboukian et al. (2008, retrospective cohort, [+]) studied 80 patients with heart failure taking warfarin. Tobacco use was associated with a lower INR.

The University of Illinois at Chicago (1999, case control, [+]) report compared 18 smokers and 35 non-smokers, who were on a stable warfarin dose for at least a month, in warfarin pharmacokinetics (PK) There were no significant differences in any PK parameters.

Weiner et al. (1984, retrospective cohort, [+]) studied 174 patients undergoing cardiac valve replacement. There was no difference between smokers and nonsmokers in their daily warfarin maintenance dose.

Whitley et al. (2007, retrospective cohort, [+]) looked at predictors of warfarin dose in 131 patients. The results showed no significant effect of tobacco use.

Three of these studies were included in a meta-analysis looking at the percentage difference in warfarin dose between smokers and non-smokers (Millican, Lenzini et al. 2007; Gage, Eby et al. 2008; Lenzini, Grice et al. 2008). This showed a 12% increase (95%CI: 7-17%; p<0.001) in warfarin dosing to smokers. Three studies were included in a meta-analysis to assess the additional milligrams of warfarin dose needed in smokers, compared to non-smokers (Lee, You et al. 2005; Aquilante, Langaee et al. 2006; Whitley, Fermo et al. 2007). This showed a non-significant increase in warfarin dosage of 2.26mg (95% CI: -2.53-7.04) in smokers.

A sensitivity analysis of multivariate studies that included pharmacogenomics factors was also undertaken. Authors were able to convert data from 1 study that reported increased dose to % increase so that data from 4 studies could be included in the meta-analysis. The analysis showed a 13% increase in dose required in smokers (95%CI: 9-18).

We found two relevant case studies

Kuykendall (2004, case study, [-]) describes a case of a 34-year-old male with a history of four myocardial infarctions and ischaemic strokes. He was prescribed warfarin, but it was difficult to achieve a therapeutic INR level. He was a smokeless tobacco user. In an effort to achieve a therapeutic INR he was asked to stop his tobacco use and in 6 days his INR increased from 1.1 to 2.3.

Evans et al (2005, case study, [-]) report on a case of a 58-year-old man on a stable dose of warfarin, admitted to hospital with bacterial meningitis. He was a smoker but after this admission he decided to quit. His INR on discharge was 2.0, two months after discharge his INR had increased to 5.5 (outside the therapeutic range). His warfarin dose was decreased and his INR stabilised.

The British National Formulary (BNF) does not provide any advice on warfarin dosage adjustments in relation to smoking or smoking cessation. However the summary of product characteristics for warfarin (available online at http://www.medicines.org.uk/EMC/) states that smoking cessation "may exaggerate the effect of warfarin tablets, and necessitate a reduction of dosage" (Goldshield Group Limited 2010).

INTERPRETATION

Stopping smoking is likely to lead to some 12% increase in plasma levels of warfarin. This could be more in individual cases. Monitoring of warfarin levels when there is a change in smoking status is recommended.

EVIDENCE STATEMENTS 1.1: EFFECTS OF NICOTINE IN PATIENTS WITH CVD

STUDIES EXAMINING ACUTE EFFECTS OF NRT ON THE CARDIOVASCULAR SYSTEM

In laboratory studies involving several different NRT formulations, acute effects of NRT on cardiovascular parameters were weaker than effects of smoking. Where participants smoked and used NRT during the same time period, NRT use did not contribute any additional negative effects. No signal of risk that would require further investigation has emerged.

ES 1.1.1 There is strong evidence that the acute effects of NRT on cardiovascular function are significantly smaller than smoking (Benowitz et al. 1993, RCT, [+]; Gembala 2006, non-randomised CT, [+]; Keeley 1996, RCT, [+]; Mahmarian 1997, prospective cohort, [+])

ES 1.1.2 There is moderate evidence that NRT has no acute adverse effect on cardiovascular function in patients with stable CVD (Nitenberg 1999, controlled trial, [+]; Tanus-Santos 2001, controlled cross-over trial, [+])

STUDIES EXAMINING THE EFFECTS OF NRT WHEN USED TO STOP SMOKING

No randomised trial comparing NRT and placebo, or cohort study comparing users of NRT with other groups, found any signal of risk in terms of adverse events, changes in CVD, MI or stroke. Most studies identified in this systematic review used nicotine patches. Only one experimental study looked at nicotine nasal spray and four investigated the effects of oral NRT (mostly nicotine gum), however the conclusions from these studies are not different from those examining the effects of patches. These data provide good evidence of the low risk of NRT in CVD patients.

Four case studies reported cardiac events occurring in smokers using NRT. All four concern patches, which are the only NRT product that media linked to cardiac events. A very large number of cardiac incidents occur daily and they will coincide with practically any activity and medication, but of course a rare causal effect cannot be ruled out.

A systematic reviews which included studies reporting cardiovascular events following NRT or placebo use in healthy populations concluded that NRT does not cause adverse cardiovascular events in healthy users.

A number of commentaries agree that benefits of NRT outweigh any risks.

Overall, there is no evidence suggesting that NRT use is associated with an increased risk of cardiovascular adverse events in people with CVD.

ES 1.1.3 There is strong evidence that use of NRT does not lead to adverse events when used in patients with stable CVD (Joseph et al 1996, RCT [++]; The Group for the Study of Transdermal Nicotine in Patients with Coronary Artery Disease 1994, RCT, [++]; Tzivoni et al 1998, RCT [+]; Marsh et al (2005, RCT [+]; Hubbard et al. 2005, Retrospective cohort [+]; Kimmel et al 2001, Case control [+]; Meine et al 2005, Case control [+]; Willmer and Bell 2003, retrospective audit, [-])

ES 1.1.4 There is strong evidence that use of NRT in the general population is not associated with an increased risk of cardiac events (Greenland et al 1998, systematic review, [++]; Hubbard et al. 2005, Retrospective cohort [+]; Allen et al. 1994, RCT [++]) or stroke (Greenland et al 1998, systematic review, [++]; Hubbard et al. 2005, Retrospective cohort [+]).

ES 1.1.5 There is moderate evidence that NRT does not cause any serious adverse events in patients with unstable CVD (Kimmel et al 2001, Case control [+]; Meine et al 2005, case control study [+]; Willmer and Bell 2003, retrospective audit, [-]).

EFFECTS OF STOPPING SMOKING ON PATIENTS' WELLBEING AND ON CVD MEDICATIONS

Among patients hospitalised for MI or CABG surgery, long-term stress levels decreased in those who stopped smoking, but remained unchanged in smokers.

Stopping smoking is likely to lead to some 12% increase in plasma levels of warfarin. Monitoring of warfarin levels when there is a change in smoking status is recommended.

ES 1.1.6 There is moderate evidence that in smokers with CVD who stop smoking successfully long-term levels of stress decrease rather than increase (Hajek et al. 2010, prospective cohort, [+])

ES 1.1.7 There is moderate evidence that smokers may require higher doses of warfarin to achieve an INR in therapeutic range (Aquilante et al. 2006, prospective cohort, [+]; Gage et al. 2008, prospective cohort, [+]; Lee et al. 2005, prospective cohort, [+]; Lenzini et al. 2008, prospective cohort, [+]; Millican et al. 2007, prospective cohort, [+]; Mungall et al 1985, retrospective cohort, [+]) Pamboukian et al. 2008, retrospective cohort, [+]), but four studies found no difference between requirements in smokers vs. non-smokers (Mitchell et al. 1972, retrospective cohort, [+]; The University of Illinois at Chicago 1999, case control, [+]; Weiner et al. 1984, retrospective cohort, [+]; Whitley et al. 2007, retrospective cohort, [+])

ES 1.1.8 There is moderate evidence that stopping smoking can lead to an increase in the systemic level of warfarin, with an associated increase in INR (Bachmann et al 1979, prospective cohort, [+]; Kuykendall 2004, case study, [-]; Evans et al (2005, case study, [-])

PART 2: EFFECTS OF NICOTINE AND EFFECTS OF STOPPING SMOKING ON PATIENTS ADMITTED TO ICU OR UNDERGOING SURGERY

Regarding the impact of acute changes in nicotine and smoke intake on surgery outcomes, there exist two contradictory concerns. One is that stopping smoking shortly before surgery may increase the risk of post-operative complications, and the other that nicotine from NRT can impair wound healing and post-operative recovery.

An influential paper by Warner (1989) initiated the first concern. There now exists a volume of empirical literature on this topic, which we recently reviewed (Myers et al. 2011). The systematic review and meta-analysis found no increase in risk associated with stopping smoking. Warner's paper was largely cited as a reason for why smoking cessation interventions should not be instigated prior to surgery (i.e. as a barrier) and so this topic will be covered in Review 3.

The second concern involves specifically nicotine and the relevant evidence is reviewed below.

The studies are presented in three sections.

1. Section 1 concerns perioperative outcomes
2. Section 2 concerns ICU outcomes
3. Section 3 concerns effects of tobacco withdrawal and NRT on the risk of delirium
4. Section 3 covers the effects of nicotine and tobacco withdrawal on the perception of pain

SECTION 1: EFFECTS OF NICOTINE ON PERIOPERATIVE OUTCOMES

We identified 8 studies with relevant information, summarised in Table 5. They concern effects of nicotine patches on perioperative outcomes, effects of nicotine versus other constituents of tobacco smoke on bone healing, and some other effects with unclear implications.

Table 5: Summary of studies included in part 2 section 1

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Czarenetzki et al (2011)	Randomised controlled trial	Switzerland Non-smokers receiving GA for surgery (N=90) given patches or placebo 1 hour before surgery.	Post-operative nausea and vomiting (PONV).	More insomnia in the first post-operative night in the nicotine group.	Quality + Patches induce nausea in non-smokers
Groundine & Morley (1996)	Case report	USA Smoker on patch having laser treatment for cervical dysplasia	Hypotension and bradycardia.	Suggests NRT in combination with vasopressin caused the symptom	Quality -
Jagadeesan et al (2007)	Case report	UK Smoker undergoing surgery for a tumour excision,	Vascular spasm.	Suggests NRT may have contributed to vascular spasms.	Quality -

		wearing a nicotine patch.			
Paciullo et al (2009)	Retrospective cohort	USA 2057 patients with CABG surgery. 90 used nicotine patches post-operatively. 67 were randomly selected and matched to a sample of smokers not using NRT.	Hospital mortality	In the matched sample 3 NRT users died compared to none of non-users. The difference was significant when other variables entered.	Quality +
Puura et al (1998)	Randomised controlled trial	Finland 100 minor surgery patients on nicotine or placebo patch pre-surgery. Group 3 on placebo, smoked up to 1-3 hours pre- surgery	Atracurium (ATR) induced neuromuscular block	Abstinence from smoking without patch (but not with patch) increases duration of ATR neuromuscular block	Quality ++ RCT
Soreide et al (1995)	Randomised controlled trial	Norway 44 smokers having gynaecologic laparoscopy given gum or no gum before surgery.	Gastric fluid volume and acidity.	No differences between the groups. Gum associated with less dry mouth, thirst and irritability.	Quality ++
Usuki et al (1998)	Cohort study	Japan 86 volunteers (25 smokers) given 2mg nicotine gum or ordinary gum.	Skin temperature and cutaneous blood flow (CBF).	Elevation in skin temperature and CBF on NRT.	Quality - Non-randomised, methods and results unclear
W-Dahl & Toksvig-Larsen (2007)	Prospective cohort study	Sweden 175 patients having tibial osteotomy, 41 smokers, 21 oral snuff users and 113 non-smokers.	Time in external fixation and post-operative complications.	Smokers needed longer fixation and had more complications, no difference between snus users and non-smokers.	Quality +

Two case studies suggest possible reasons for removing NRT patches prior to surgery.

Jagadeesan et al. (2007, case study, [-]) reported occasional episodes of intra-operative vascular spasm in a patient undergoing tumour excision while wearing a nicotine patch. The spasms were benign and their link with the patches speculative, but the authors recommend removing patches before surgery, particularly before microvascular reconstructive surgery.

Groundine & Morley (1996, case study, [-]) reported severe hypotension and bradycardia during gynaecological surgery in a patient who received a paracervical injection of vasopressin. The patient was wearing nicotine patch and the authors propose that the complication may have been caused by a synergism of vasoconstrictive properties of nicotine and vasopressin. They suggest nicotine patches should be removed 24h before surgery if exposure to vasopressin is anticipated.

One cohort studies examined safety of patches administered to post-coronary artery bypass surgery.

Paciullo et al (2009, retrospective cohort, [+]) studied 2057 patients (579 smokers and 1478 non-smokers) who underwent coronary artery bypass grafting. Ninety patients used nicotine patches post-operatively. 67 smokers using NRT were randomly selected from the 90 and matched for pack year history and APACHE II (Acute Physiology and Chronic Health Evaluation 2) score to a sample of smokers. Three patients using NRT died during their hospital stay, versus none in the non-NRT group (p=0.08). In the next step, all smokers using

NRT post-operatively, smokers not using NRT, and non-smokers were compared in hospital mortality. No significant difference in mortality was seen between the NRT (3%), non-NRT (1%), and non-smokers (2%) groups. However, when differences in age and baseline atrial fibrillation were controlled for, NRT users had a significantly increased risk compared to non-NRT users (OR=6.06; CI: 1.65-22.21).

One study suggests that patches during surgery reduce the need for atracurium maintenance.

Puura et al. (1998, RCT [++]) studied atracurium-induced neuromuscular block (NB) in non-smokers (N=20) and in smokers abstaining for at least 10 hours prior to surgery who were randomised to receive 21mg patches (N=30), placebo patches (N=30) or were allowed to smoke 1-3 hours before anaesthesia (N=20). The placebo group experienced a significantly longer duration of the block ($p<0.05$) and needed smaller maintenance dose of atracurium ($p<0.001$) than all the other groups. Curiously, the authors avoid discussing practical implications (which seem to be that unaided abstinence is preferable to NRT in this particular respect).

A good quality study suggests that constituents of tobacco smoke other than nicotine are responsible for slow bone healing.

W-Dahl and Toksvig-Larsen (2007, prospective cohort study [+]) compared post-surgery bone healing in 41 smokers, 21 users of oral snuff (which contains nicotine but no combustion products), and 113 non-smokers undergoing high tibial osteotomy. Smokers needed longer time in external fixation than the other two groups ($p=0.03$) and had a much higher risk of developing complications (RR=6.1, CI: 1.2-36.4), with no difference between snus users and non-smokers (delayed healing 0% vs. 9%, NS, and complications 5% vs. 22%, NS, for snus users and non-smokers)

We identified three other studies, which have some, albeit mainly indirect relevance to the considerations of the safety of nicotine use in surgery patients.

Soreide et al. (1995, RCT, [++]) studied the effects of chewing nicotine chewing gum compared to no chewing on the morning before gynaecologic surgery on gastric fluid volume and acidity during surgery in 44 smokers. The two groups showed no difference, but the gum was associated with a reduction in dryness of the mouth ($p=0.001$), thirst ($p=0.03$) and irritability ($p=0.03$).

In a curious study, **Czarnetzki et al. (2011, RCT, [+])** gave 90 non-smokers nicotine or placebo nicotine patches (24h, 17.5 mg) one hour before surgery. This was to see if nicotine alleviates post-operative nausea and vomiting (PONV). There was no effect, though it is possible that the patches alleviated PONV but induced nicotine nausea at the same time so the effects cancelled each other. Nicotine patches impaired sleep during the first post-operative night ($p=0.01$).

Usuki et al. (1998, cohort study, [-]) observed anecdotally that (presumably non-smoking) volunteers' hands became sweaty and warm after using nicotine gum. To verify this observation, they gave nicotine and/or ordinary chewing gum to 86 volunteers (23 were

smokers) and measured their cutaneous blood flow (CBF) and skin temperature. 64% of volunteers recorded increased CBF and 74% increased temperature after using NRT. This may mitigate concerns about vasoconstricting effects of NRT, but the study statistics and controls are unclear.

INTERPRETATION

Given the number of possible acute effects of both abstinence and nicotine intake on a number of perioperative outcomes, the literature we identified is limited.

NRT patches were associated with an increased mortality in one cohort study.

Compared to no nicotine provisions, patches and smoking increase the need for atracurium maintenance of anaesthesia.

There is evidence that the adverse effects of smoking on bone healing are not due to nicotine, which provides further reassurance regarding the use of NRT.

A single case study reports on possible vasospasm in a patient wearing a nicotine patch whilst undergoing microvascular surgery. The spasms were benign and their link with the patches speculative, but the authors recommend removing patches before surgery, particularly before microvascular reconstructive surgery. Given that there is no evidence to suggest that patch use in the perioperative period is benefit then removing patches prior to surgery is reasonable. However the need for post-operative NRT use should be considered. Any risks of using NRT are outweighed by the risks associated with smoking.

Section 2: Effects of nicotine in Patients Requiring Intensive Care

We identified 5 studies with relevant information concerning the effects of nicotine (all studies investigated the effect of nicotine patches) in patients requiring intensive care (see Table 6). We also include Paciullo et al (2009) again as patients undergoing CABG require intensive care post-operatively.

Table 6: Summary of studies included in part 2 section 2

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Carandang et al (2011)	Retrospective cohort study	USA 1486 patients with subarachnoid haemorrhage (SAH) admitted to neuro-ICU. Of 352 smokers 87 used NRT patch.	Clinical and angiographic vasospasm, Glasgow Coma Outcome Score (GOS) on discharge.	NRT users had less vasospasm and shorter length of hospital stay than smokers not using patch.	Quality +
Cartin-Ceba et al (2011)	Prospective cohort study	USA 2441 consecutive ICU patients. 174 of 330 smokers used NRT within 24 hours of admission	Hospital and ICU mortality, length of ICU and hospital stay	NRT use not associated with an increased risk of mortality.	Quality +
Lee et al (2007)	Retrospective cohort study	USA Of 6735 admissions to a medical ICU, 90 patients who received NRT were matched with 90 smokers not on NRT.	Hospital mortality, 28-day ICU and mechanical ventilator-free days	More deaths among smokers on NRT than among other smokers (20% vs. 7%, p<0.01)	Quality +
Paciullo et al (2009)	Retrospective cohort	USA 2057 patients with CABG surgery. 90 used nicotine patches post-operatively. 67 were randomly selected and matched to a sample of smokers not using NRT.	Hospital mortality	In the matched sample 3 NRT users died compared to none of non-users. The difference was significant when other variables entered.	Quality +
Panos et al (2010)	Retrospective cohort study	USA 340 patients admitted to a neurosurgery ICU; 114 were smokers who received 21mg nicotine patch; 113 were smokers who did not receive NRT; and 113 non-smokers.	Unfavourable hospital discharge (UHD) disposition, angiographic documented vasospasm.	No difference in UHD, or vasospasm (when controlling for the presence of SAH) between NRT users vs. non-users. NRT users had significantly longer hospital stay.	Quality +
Seder et al (2011)	Retrospective cohort study	USA 234 smokers with SAH admitted to a neuro-ICU. 128 patients received 21mg patch and 106 did not.	Diagnosis of delirium	NRT users had more pneumonia, delirium, pulmonary oedema and seizures but lower death rate at 3 months.	Quality +

Carandang et al (2011, retrospective cohort, [+]) reported on 352 smokers admitted to a neuro-intensive care unit (neuro-ICU) for treatment of subarachnoid haemorrhage (SAH), 87

of whom were treated with a nicotine patch (doses ranged between 7-21mg). A matched non-NRT control group was formed of 171 smokers. NRT users had less severe clinical disease. Mortality was not significantly different between the NRT and non-NRT groups (2% vs. 7%; p-value not reported). The NRT group had a lower proportion of clinical vasospasm (20% vs. 33%, p=0.026) and more patients with a better scores on Glasgow Coma Scale Score (82% vs. 63%, p=0.005). In multivariate analysis, adjusting for the aneurysm grade, NRT group had less clinical vasospasm (OR=0.45, CI: 0.23-0.88, p=0.019). There was no difference in angiographic vasospasm. NRT users had significantly shorter length of stay (17.4 vs. 21.5 days, p=0.0168).

Cartin-Ceba et al (2011, prospective cohort [+]) studied 330 critically ill smokers admitted to intensive care. NRT (21mg patch) was started within 24 hours of admission in 174 of these smokers; the remaining 156 did not receive NRT. There were no significant differences between the groups in hospital mortality, length of hospital stay, or 28-day mechanical ventilator free days. Adjusting for baseline differences, NRT use was not related to hospital mortality (OR=1.4 CI: 0.5-3.9, p=0.51).

Lee et al (2007, retrospective cohort, [+]) screened 6,735 admissions to a medical ICU, to find that NRT was provided to 115 smokers. After excluding patients with missing data and those who started NRT after 24hours of admission, 90 patients were included in the NRT group and matched with 90 control patients who smoked. Baseline characteristic differed only on ethnicity (p=0.03). There were more hospital deaths among NRT users (20% vs. 7%, p=0.0085). When adjusted for severity of disease NRT remained an independent risk factor for hospital mortality (Odds Ratio = 24.6 95%CI: 3.6-167.6, p=0.001).

Paciullo et al (2009, retrospective cohort, [+]) has been summarised above, but to recap the study reports on outcomes of 67 patients who underwent CABG surgery and used nicotine patches post-operatively matched with a sample of smokers. Three patients using NRT died during their hospital stay, versus none in the non-NRT group (p=0.08). The study also compared in hospital mortality between all smokers using NRT post-operatively, with smokers not using NRT, and non-smokers. No significant difference in mortality was seen between the NRT (3%), non-NRT (1%), and non-smokers (2%) groups. However, when differences in age and baseline atrial fibrillation were controlled for, NRT users had a significantly increased risk compared to non-NRT users (OR=6.06; CI: 1.65-22.21).

Panos et al (2010, retrospective cohort, [+]) studied a cohort of 340 patients admitted to a neuro-ICU. There were 114 smokers who received 21mg nicotine patch, 113 were smokers who did not receive NRT; and 113 non-smokers. Smokers who used NRT, compared to smokers who did not, were significantly more likely to have a diagnosis of SAH (49% vs. 28%, p<0.001), and smoked more packs per day (1 vs. 0.7, p=0.04). There was no difference in unfavourable discharge outcomes between smokers using NRT, compared to those who did not (42% vs. 33%, p=0.17). Smokers using NRT had significantly longer hospital stays (13 vs. 9.7 days, 0=0.014) and were more likely to have angiographic documented vasospasm (20% vs. 11%, p=0.016), although the difference in the latter lost significance when data were adjusted for presence of SAH.

Seder et al (2011, retrospective cohort [+]) report on 234 smokers with SAH admitted to a neuro-ICU; 128 received NRT (21mg patch) and 106 did not. NRT users were more likely to be heavier smokers (p<0.001) and drinkers (p=0.01), have diabetes (p=0.006), and have cerebral oedema on admission (p<0.001). A higher proportion of NRT users suffered pneumonia (29% vs. 17%, p=0.037), pulmonary oedema (24% vs. 9%, p=0.004), delirium (19% vs. 7%, p=0.006), and seizures (9% vs. 2%, p=0.024), compared to non-NRT users. However death at 3-months was lower among NRT users (7% vs. 17%, p=0.02). In

multivariate analysis NRT use remained associated with a lower risk of death (OR=0.12, CI 0.04-0.37, p < 0.001).

INTERPRETATION

Given the number of possible acute effects of both abstinence and nicotine intake on a number of ICU outcomes, the literature we identified is limited.

The reviewed studies suggest that patches are often provided to acutely ill patients admitted to ICU who are unlikely to request such help or to suffer from tobacco withdrawal. We examine the rationale and evidence for this in the next section.

NRT patches were associated with an increased mortality in one of the five cohort studies. However patch use was also associated with a longer hospital stay, less vasospasm, and no effect in other studies. The results are difficult to integrate as there were a number of differences between patients who were and who were not given the patches and different studies concerned different population and outcome measures.

SECTION 3: EFFECTS OF SMOKING, TOBACCO WITHDRAWAL, AND NRT ON THE RISK OF DELIRIUM

A number of hospitals give NRT patches automatically to smokers undergoing surgery and to those admitted to ICUs. Such smokers normally do not ask for NRT and are not bothered by the need to smoke. They are usually not consulted about receiving the patches. The practice seems to be in place due to a perception that smokers are more likely to suffer from delirium, which can lead to removal of intubation and other disruption, and that NRT alleviates the risk.

We identified 9 papers with relevant content. These are summarised in Table 7.

Table 7: Summary of studies included in part 2 section 3

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Cartin-Ceba et al (2011)	Prospective cohort study	USA 2441 consecutive patients admitted to ICU. Of current smokers (n=330) 174 used NRT within 24 hours of admission; 156 did not.	Delirium control and agitation control.	NRT users were more likely to be confused and need physical restraint than non-NRT users.	Quality - No control for baseline differences in delirium analyses
Dubois et al (2001)	Prospective cohort study	Canada 216 ICU patients admitted for at least 24 hours	Diagnosis of delirium	Smoking at least 20 cpd linked to increased risk of delirium in univariate, but not multivariate analysis	Quality +
Lucidarme et al (2010)	Prospective cohort study	France 144 ICU patients (44 smokers) requiring	Presence of agitation or delirium, number	Smokers more likely to have agitation or delirium, higher rates	Quality - No control for baseline

		mechanical ventilation for > 48 hours. No patients received NRT.	of ventilator free days, total doses of sedatives and analgesics.	of accidental removal of tubes and catheters, more sedation and physical restraints.	differences in delirium analyses
Miyazaki et al (2011)	Retrospective cohort study	Japan 685 patients' (178 smoked) records reviewed after CABG surgery	Diagnosis of post-operative delirium	Smoking was a significant predictor of delirium in multivariate analysis (p=0.048)	Quality +
Mayer et al (2001)	Case studies	5 case studies of the development of delirium in patients who smoke with brain injury admitted to ICU		Each shows an improvement when treated with a 21mg nicotine patch.	Quality -
Nicholson & Rolfson (2006)	Retrospective cohort study	Canada 163 elderly patients, orthopaedic hip replacement.	Diagnosis of post-operative delirium	Smoking status was not associated with delirium.	Quality - No control for baseline differences
Ouimet et al (2007)	Prospective cohort study	Canada 820 ICU patients admitted for at least 24 hours	Diagnosis of delirium	Smoking was a significant predictor of delirium in univariate (p=0.0123) but not multivariate analysis.	Quality +
Seder et al (2011)	Retrospective cohort study	USA 234 smokers with SAH admitted to a neuro-ICU. 128 patients received 21mg patch and 106 did not.	Diagnosis of delirium	NRT users had more pneumonia, delirium, pulmonary oedema and seizures but lower death rate at 3 months.	Quality +
Van Rompaey et al (2009)	Prospective cohort study	Belgium Consecutive patients (N=523; 131 were smokers) admitted to an ICU.	Diagnosis of delirium.	Smoking status not related to delirium.	Quality – No control for baseline differences in delirium analyses

We identified six studies assessing the link between smoking status and delirium.

Dubois et al (2001, prospective cohort, [+]) studied 216 patients admitted to an ICU for more than 24 hours. Delirium developed in the majority of patients (78%) in the first 36 hours of admission. Univariate analysis showed that smoking a minimum of 20 cigarettes a day prior to admission was associated with an increased risk of delirium (OR=2.2 95% CI: 1.07-4.51). In the multivariate analysis being a heavy smoker prior to admission was not a significant predictor of delirium (OR=2.2 95%CI 0.94-4.94). Compared to non-delirious patients, those with delirium were more likely to remove of catheters (p=0.003) and extubate (p=0.02) themselves. Delirium was not associated with an increased risk of mortality or longer hospital stay.

Lucidarme et al. (2010, prospective cohort, [-]) studied 144 patients (44 smokers) admitted to an ICU who required mechanical ventilation for > 48 hours. Smokers were more likely to develop agitation or delirium (64% vs. 32%, p=0.0005) and spend more days with agitation (1.54 vs. 0, p=0.0006). They were also significantly more likely to have higher rates of accidental removal of tubes and catheters, and required more sedation and physical restraints. After adjustment of baseline differences, smoking remained a significant

predictor of agitation (OR=3.13, CI: 1.45-6.74) but not of delirium. Matching of cases and controls was possible for 62 patients (31 in each group). The proportion of patients who had at least one event of agitation was 80% vs. 42%, p=0.004.

Miyazaki et al. (2011, retrospective cohort, [+]) reviewed the clinical records of 685 patients following coronary artery bypass surgery. Post-operative delirium was seen in 118 patients. Smoking was not a significant predictor of delirium in univariate analysis but it was a significant predictor in multivariate analysis (OR=1.65, 95%CI: 1.00-2.72, p=0.048).

Nicholson et al. (2006, retrospective cohort, [-]) studied patients over the age of 75 who were undergoing orthopaedic hip replacement surgery to see if tobacco withdrawal increased post-operative delirium. Only 7.4% of all patients included in the study were smokers. Smoking status was not associated with delirium (p=.54).

Ouimet et al. (2007, prospective cohort, [+]) assessed the risk factors for delirium in a sample 820 consecutive patients admitted to ICU for more than 24 hours. Delirium was assessed in a sample of 764 patients (56 were comatose for > 5days). 243 patients were diagnosed with delirium. Being a current smoker was a significant risk factor for delirium (p=0.0123) in univariate analysis, but it was no longer a significant predictor in the multivariate analysis.

Van Rompaey (2009, prospective cohort, [-]) studied patients admitted to ICUs at four hospitals who were then screened for delirium. 131 were daily smokers and 366 were non-smokers. Delirium was recorded in 33/131 (25%) of smokers and 120/366 (31%) of non-smokers. Daily smokers represented 22% of patients who had delirium and 27% of those who did not. Smokers who reported smoking over 10 cigarettes per day were represented more among the group who had delirium (48%) then among those who did not (31%). Smoking did not feature as a predictor of delirium in a multivariate model including a range of variables, but the results are difficult to follow.

Two studies examined the link between NRT and delirium in ICU and post-surgery patients.

Cartin-Ceba et al (2011, prospective cohort [-]) studied 330 critically ill smokers admitted to intensive care. NRT (21mg patch) was started within 24 hours of admission in 174 of these smokers; the remaining 156 did not receive NRT. There were no significant differences between the groups in hospital mortality, length of hospital stay, or 28-day mechanical ventilator free days. Adjusting for baseline differences, NRT use was not related to hospital mortality (OR=1.4 CI: 0.5-3.9, p=0.51). NRT patients, compared with those not receiving NRT, were more likely to be confused (23% vs. 13.1%, p<0.001) and needed to be physically restrained (38% vs. 19.5%, p<0.001). The authors' note that it is more likely that patients were administered NRT because of confusion and agitation, as opposed to NRT causing this.

Seder et al (2011, retrospective cohort [+]) report on 234 smokers with SAH admitted to a neuro-ICU; 128 received NRT (21mg patch) and 106 did not. NRT users were more likely to be heavier smokers (p<0.001) and drinkers (p=0.01), have diabetes (p=0.006), and have cerebral oedema on admission (p<0.001). A higher proportion of NRT users suffered pneumonia (29% vs. 17%, p=0.037), pulmonary oedema (24% vs. 9%, p=0.004), delirium (19% vs. 7%, p=0.006), and seizures (9% vs. 2%, p=0.024), compared to non-NRT users. However death at 3-months was lower among NRT users (7% vs. 17%, p=0.02). In multivariate analysis NRT use remained associated with a lower risk of death (OR=0.12, CI 0.04-0.37, p < 0.001).

We identified one relevant case study

Mayer (2001, case study [-]) presented 5 cases of delirium in smokers admitted to intensive care with brain injuries which showed an improvement when treated with a 21mg nicotine patch.

Two general reviews included some consideration of NRT use in the ICU setting to manage tobacco withdrawal.

Fronterta (2011, selective review [-]) supports such use of NRT, quoting Mayer (2001) and Lucidarme et al. (2010) as evidence of tobacco withdrawal causing disruption within the ICU setting.

Honisett (2001, review [+]) recommends further research into whether ICU patients do get tobacco withdrawal symptoms whilst sedated and whether NRT help.

INTERPRETATION

Smoking status was not consistently related to the risk of delirium in cohort studies. Four cohort studies found no link, while two studies not controlling for other variables did. Two observational studies found more rather than less delirium in ICU smokers on patches, but it is likely that high-risk patients were more likely to be given the medication. Case studies suggest that delirium may be alleviated by NRT, but it is also possible that the episodes subsided spontaneously.

No controlled trial has examined the effects of patches on delirium or any other ICU or surgery outcome.

The practice of putting patches on smokers undergoing major surgery or admitted to ICU to prevent delirium appears to have no sound evidence base. Two studies suggest that such practice may increase mortality and no study suggests that it helps.

The practice should be suspended until trials of effects of NRT on surgery and ICU outcomes provide evidence that this is beneficial rather than irrelevant or harmful.

SECTION 4: STOPPING SMOKING AND PERCEPTION OF PAIN

INTRODUCTION

Nicotine has acute analgesic properties (Jamner 1998) and there is some evidence from animal studies that nicotine withdrawal is associated with increased sensitivity to pain stimuli (Anderson et al. 2004; Biala et al. 2005). Many smokers also view smoking as a coping tool for stress in general and for pain in particular (Hajek et al. 2010, Hooten et al. 2011), and may be worried that smoking deprivation may have a negative effect on their capacity to cope with pain. There is some evidence that it is difficult for smokers with chronic pain to achieve abstinence from smoking (Fishbain et al 2008, Hooten et al 2009).

There is thus a concern that in the context of acute care, stopping smoking may have a negative effect on pain perception and patient comfort. Such concern may represent one of the barriers to stop-smoking interventions.

We identified six studies (summarised in Table 8) looking at analgesic effects of nicotine in patients undergoing surgery.

Table 8: Summary of studies included in part 2 section 4 [A]

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Flood and Daniel (2004)	Randomized controlled trial	USA 20 female non-smokers undergoing myomectomy or hysterectomy used nicotine nasal spray or placebo post-operatively	Post-operative pain scores and dose of patient controlled analgesia (PCA)	Nasal spray, compared with placebo lowered pain scores and reduced the need to PCA	Quality +
Habib et al (2008)	Randomized controlled trial	USA 90 non-smokers undergoing radical prostatectomy used 7mg nicotine patch or placebo 30-60 min before anaesthesia	Post-operative pain scores and use of morphine post-operatively	No difference in pain scores but patients using nicotine patches used less morphine.	Quality +
Hong et al (2008)	Randomized controlled trial	USA 40 non-smokers having pelvic or abdominal surgery used placebo, 5, 10, or 15 mg patches	Post-operative pain scores	Patch use resulted in lower pain scores for the first ($p<0.01$) and for the next 4 days at home ($p<0.05$).	Quality +
Olson et al (2009)	Randomized controlled trial	USA 28 smokers having abdominal or pelvic surgery used 0, 5, 10 or 15 mg patches.	Post-operative pain scores	No effect of the nicotine dose and no overall effect.	Quality – Small sample
Turan et al (2008)	Randomized controlled trial	USA 97 hysterectomy patients (60% were smokers) used 21mg	Post-operative pain scores, analgesic use, time to return to work	No effect on pain, analgesics use or time to return to work. More nicotine	Quality +

		nicotine patches or placebo to 1 hour before and for 2 days after surgery.		group ready for discharge at 48 hours (p<0.001) and 72 hours (p<0.04).	
Yagoubian et al. (2011)	Randomized controlled trial	20 non-smokers having third molar surgery given nicotine nasal spray (3mg) and placebo during 2 visits	Post-operative pain scores and analgesic use	Spray associated with less pain during 5 days after surgery. No effect on analgesia use.	Quality +

[A] Effects of nicotine on post-surgery pain

Flood and Daniel (2004, RCT, [+]) found that in 20 female non-smokers undergoing myectomy or hysterectomy, nicotine nasal spray (3mg) administered at the completion of surgery, lowered pain scores (p<0.001) and reduced the dose of patient-controlled analgesia (PCA) for 60 min after surgery (p<0.05), compared with placebo treatment. Pain scores were significantly lower for a full 24 h after nicotine dosing (p<0.01).

Habib et al. (2008, RCT, [+]) gave 7mg or placebo patches 30–60 min before surgery to 90 non-smokers undergoing prostatectomy. Patches were left in place for 24 h. There was no effect on pain score, but patients on nicotine used significantly less morphine at 24 h (p<0.01), and plasma nicotine concentrations were negatively correlated with morphine consumption (P<0.01). There was more nausea in the nicotine-treated group (p<0.05).

Hong et al. (2008, RCT, [+]) gave placebo, 5, 10, or 15 mg/16 h nicotine patches to 40 non-smokers undergoing pelvic or abdominal surgery. This resulted in lower pain scores for the first hour after surgery (p<0.01) and then for the next 4 days at home (p<0.05).

Olson et al. (2009, RCT, [-]) gave 0, 5, 10 or 15 mg 16-hour patches to smokers undergoing abdominal or pelvic surgery. There were 6-8 participants in each group. There was no effect of the dose and no overall effect, but merging the three nicotine arms produced a group with a higher pain score over the first hour after surgery compared to the placebo group (p<0.01), while the placebo group had higher diastolic blood pressure in the first hour (11 mm Hg, p<0.01). There were no other significant effects over any other time period on any variable.

Turan et al. (2008, RCT, [+]) gave 21mg nicotine patches or placebo to 97 hysterectomy patients (60% were smokers) 1 hour before and for 2 days after surgery. This had no significant effect on pain ratings or analgesics use or the time to return to work (19 days). There was no difference between the responses of smokers and non-smokes on these variables. However, more patients in the nicotine group were ready for discharge at 48 hours (p<0.001) and 72 hours (p<0.04). These outcomes are not reported separately for smokers and non-smokers.

Yagoubian et al. (2011, RCT, [+]) administered nicotine nasal spray (3mg) and placebo to 20 non-smokers undergoing third molar surgery during two visits. Nicotine treatment was associated with a decrease it post-operative pain reported during 5 days after the surgery. The effect was very strong in the first day after surgery where pain scores were almost halved. The use of pain tablets (hydrocodone/ acetaminophen) was not affected.

INTERPRETATION

Given that most studies had only small samples, the fairly consistent finding of a significant effect suggests that the nicotine-induced analgesia is a genuine phenomenon that should be evaluated in more definitive trials. The Habib et al. (2008) finding of an objectively measured dose response between blood nicotine concentrations and self-administered analgesics provides an indication of a true biological effect.

The results seem consistent in the four studies of non-smokers but not in the two studies that included smokers. This tallies with the hypothesis that the prolonged effect of a single dose of nicotine observed in some studies may be a result of a lack of desentization of nACh receptors at very low concentrations (Benowitz 2008), which is more likely to arise in non-smokers who lack tolerance to nicotine effects. Other explanations of the effect include potential synergy with an opioid, and inhibition of inflammation (Habib et al 2008, Benowitz 2008), which can again be expected to be more pronounced in people 'naïve' to nicotine than in regular users.

The evidence above may have some tentative bearing on the hypothesis that in smokers, nicotine deprivation may heighten post-surgery pain (i.e. if nicotine reduces post-surgery pain, it is possible that its removal in habitual users increases it), but the reduction seems to apply to non-smokers rather than to smokers. It can also possibly provide an indirect argument for providing nicotine replacement to smokers undergoing surgery. However, such assumptions require empirical verification.

Olson et al. included smokers in their study, but the study was too small to detect any realistic effects, and further diluted by graded nicotine exposure and by combining experimental groups with very different response profiles. The lack of studies looking at the effect of NRT on post-surgery pain in acutely deprived smokers represents a gap in evidence, which would be relatively easy to fill.

[B] EFFECTS OF STOPPING SMOKING ON POST-SURGERY PAIN

We found no studies addressing this issue, but identified one study (summarised in Table 9) with an indirect relevance to the topic.

Table 9: Summary of studies included in part 2 section 3 [B]

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Shi et al (2011)	Retrospective cohort	USA 4,695 smokers	Self reported pain scores	Stopping smoking had no effect on pain occurrence, pain worsening, or on resolution or improvement of pain	Quality +

Shi et al. (2011, retrospective cohort, [+]) report the results of biennial surveys of a nationally representative US sample of older smokers taking place from 1992 through 2006. In 4,695 50-60 years old smokers reporting no pain or mild pain at enrolment, stopping smoking had no effect on pain occurrence (OR=1.04, 0.92,1.17) or pain worsening (OR=0.95, 0.84,1.08). In 1,118 smokers who reported moderate to severe pain at enrolment, stopping

smoking had no effect on resolution (OR=0.97, 0.82-1.15) or improvement (OR=0.87, 0.70-1.08) of self-reported pain.

INTERPRETATION

The study provides a reassurance regarding long-term effects of stopping smoking on pain perception. However, it does not address the effects of acute nicotine deprivation on post-surgery patients. It would be difficult to randomise smokers to a condition that allows smoking shortly after surgery, and such arrangement would also not be available in the smoke-free NHS. The relevant question however could be answered relatively easily by studies discussed at the end of the previous section, i.e. by a placebo controlled trial of the effects of NRT on post-surgery pain ratings and analgesics use in smokers.

EVIDENCE STATEMENTS 1.2

EFFECTS OF NRT IN PATIENTS REQUIRING INTENSIVE CARE

Given the number of possible acute effects of both abstinence and nicotine intake on a number of ICU outcomes, the literature we identified is limited and the results are difficult to integrate as there were a number of differences between patients who were and who were not given the patches and different studies concerned different population and outcome measures.

ES 1.2.1 There is mixed evidence regarding the safety of NRT use in critically ill patients. Two studies found an increased risk of mortality associated with NRT use in ICU and bypass surgery patients (Lee et al 2007, retrospective cohort, [+]; Paciullo et al 2009, retrospective cohort, [+]). Three studies found no increased risk of unfavourable outcomes (Panos et al 2010, retrospective cohort, [+]; Carandang et al 2011, retrospective cohort, [+]; Cartin-Ceba et al 2011, prospective cohort [+]). One study found an increased risk of pulmonary complications and seizures but lower risk of mortality in NRT users (Seder et al 2011, retrospective cohort [+]).

EFFECTS OF NRT IN PATIENTS UNDERGOING SURGERY

ES 1.2.2 There is moderate evidence that the adverse effects on bone healing and post-surgical complications are not due to nicotine (W-Dahl and Toksvig-Larsen 2007, prospective cohort study [+])

ES 1.2.3 There is weak evidence to suggest that nicotine patches should be removed prior to micro vascular reconstructive surgery to limit any possible vasoconstrictive effects of nicotine and surgery using vasopressin injections (Jagadeesan et al. 2007, case study, [-]; Groundine & Morley (1996, case study, [-])

ES 1.2.4 There is strong evidence that smokers who abstain from smoking 10 hours prior to surgery need smaller doses of atracurium for maintenance of anaesthesia than those who smoke up to a few hours before surgery or wear nicotine patches (Puura et al. 1998, RCT [++])

ES 1.2.5 There is strong evidence that chewing nicotine gum prior to surgery is not associated with an increased gastric fluid volume (Soreide et al. 1995, RCT, [++])

EFFECTS OF TOBACCO WITHDRAWAL AND NRT ON RISK OF DELIRIUM

The practice of putting patches on smokers undergoing major surgery or admitted to ICU to prevent delirium appears to have no sound evidence base. Two studies reported above suggest that such practice may increase mortality and no study suggests that it helps. The practice should be suspended until randomised trials of effects of NRT on surgery and ICU outcomes provide evidence that this is beneficial rather than irrelevant or harmful.

ES 1.2.6 There is moderate evidence that abstinence from smoking does not increase the risk of delirium. (Four studies found no link: Dubois et al 2001, prospective cohort, [+]; Nicholson et al. 2006, retrospective cohort, [-]; Ouimet et al. 2007, prospective cohort, [+]; Van Rompaey 2009, prospective cohort, [-], while two studies reported a link but did not control for possible confounders: Miyazaki et al. 2011, retrospective cohort, [+]; Lucidarme et al. 2010, prospective cohort, [-])

ES 1.2.7 There is weak evidence that application of NRT is associated with an increased risk of delirium (Cartin-Ceba et al 2011, prospective cohort [-]; Seder et al 2011, retrospective cohort [+]).

EFFECTS OF NRT AND SMOKING CESSATION ON PAIN

NRT may reduces post-operative pain in non-smokers but definitive trials are needed. Stopping smoking have no long-term effect on pain ratings but the acute effects are not known.

ES 1.2.8 There is good evidence that NRT alleviates post-operative pain in non-smokers (Flood and Daniel 2004, RCT, [+]; Habib et al. 2008, RCT, [+]; Hong et al. 2008, RCT, [+]; Yagoubian et al. 2011, RCT, [+])

ES 1.2.9 There is moderate evidence that NRT does not alleviate post-operative pain in smokers undergoing surgery (Olson et al. 2009, RCT, [-]; Turan et al. 2008, RCT, [+])

ES 1.2.10 There is moderate evidence that in the long-term, smoking cessation has no effect on perception of pain in general population (Shi et al. 2011, retrospective cohort, [+])

PART 3: EFFECTS OF NICOTINE AND EFFECTS OF STOPPING SMOKING IN NON-CARDIAC AND NON-SURGICAL HOSPITAL PATIENTS

This part covers a mixture of studies concerning several disparate topics. It is divided into 3 sections.

1. Section 1 covers studies addressing safety of NRT in non-cardiac patients and effects of smoking ban
2. Section 2 concerns effects of nicotine and smoking on medications
3. Section 3 concerns the special case of ulcerative colitis.

SECTION 1: SAFETY OF NRT IN HOSPITAL PATIENTS

Thirteen studies provided some information relevant for considering the safety of NRT when used over a period of time for smoking cessation. They are summarised in Table 10.

Table 10: Summary of studies included in part 3 section 1

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Axelsson et al (2001)	Randomised placebo cross over trial	Sweden 6 patients with type-2 diabetes matched to 6 health subjects. Two sessions, infusion of nicotine or saline.	Serum glucose, free insulin and free fatty acids (FFA) were measured.	No differences in serum insulin or glucose. Nicotine increased FFA in both groups.	Quality - Smoking status unknown
Carmel and Sheitman (2007)	Case studies	USA Two patients with dementia and agitation, 7mg nicotine patch given to one and 21mg to other.		Nicotine patch alleviated agitation in both patients.	Quality -
Epifano et al (1992)	Randomised placebo cross over trial	Italy 12 patients with type 2 diabetes; 1) smoking 1 cigarette per hour; 2) 21mg patch; 3) placebo patch - all after overnight abstinence.	Insulin secretion and insulin action. Blood glucose levels.	After smoking, hepatic glucose production suppressed less by insulin than patch than placebo. Smoking associated with lower stimulation of glucose utilisation than patch than placebo.	Quality +
Gallagher (1998)	Case studies	Canada Two smokers with terminal cancer developed delirium whilst in palliative care		Delirium resolved when NRT was provided.	Quality -
Lewis et al (1998)	Randomised controlled trial	UK 185 hospital in-patients given (1) brief quit advice (2) counselling plus 22mg patch (3) counselling plus placebo.	Abstinence (CO validated) and information on AEs.	No effect on abstinence adverse events. No SAEs were reported.	Quality +
Molander	Prospective	Sweden	Levels of nicotine	Degree of renal	Quality +

et al (2000)	cohort	15 patients with chronic renal failure and nine healthy subjects given an intravenous infusion of nicotine over 10 minutes.	and cotinine in plasma, urine, and peritoneal dialysate; nicotine PK	impairment linked to nicotine clearance. Severe renal impairment lowers renal and non-renal clearance.	
Molyneux et al (2003)	Randomised controlled trial	UK 274 hospitalised smokers given usual care, counselling alone, or counselling plus NRT.	Abstinence rates and adverse events.	There were 3 deaths and 30 other SAEs. No differences between groups.	Quality +
Murray et al (1996)	Randomised controlled trial	USA 5,887 patients with early stage COPD given 2mg gum or usual care.	Hospitalisations, adverse effects of gum use	Gum use not linked to fatal or non-fatal cardiovascular events or hospitalisation.	Quality ++
Murray et al. (2009)	Randomised controlled trial	USA 3,320 from above study followed up for 7.5 years	Surveillance for cancers	Smoking during the study predicted cancer but NRT use did not	Quality +
Rigotti et al (2000)	Prospective cohort study	USA 650 smokers taking part in RCT smoking cessation programme. During the study the hospital adopted a smoke-free policy	Nicotine withdrawal symptoms	89% reported at least one symptom in the first 24-48 hours of admission. 29% reported that it was difficult or very difficult to abstain.	Quality +
Rosin et al (2001)	Case study	USA Four cases of patient with dementia and agitation; 2 former smokers, 2 non-smokers	Occurrence of agitation	All patients were given 7mg patch. Agitation decreased. One patient showed deterioration when patch removed.	Quality -
Roth et al (2002)	Case study	A 58-year-old man experienced exacerbation of asthma after using nicotine nasal spray.		The authors suggest a causal relationship.	Quality -
Whiss et al. (2000)	Prospective cohort	Sweden 10 smokers and 4 wet snuff users, 7 patients with renal failure and 7 healthy subjects. Received IV infusion of nicotine after 36 hours of abstinence form tobacco.	Blood samples for nicotine and platelet analysis taken before and after, and again 2 hours after the nicotine infusion.	Plasma concentrations of nicotine over time were not different between groups. No differences in platelet function.	Quality +
Wagena et al. (2003)	General review	Summarised the findings of the Lung Health Study on the safety of NRT		Concluded that NRT increases abstinence rates when used in smokers with COPD and has a good safety profile	Quality +
Zabaneh et al (1995)	Case study	USA 36-year-old smoker admitted with acute cholecystitis.	Denied permission to smoke but smoked anyway.	His cigarette, combined with oxygen therapy, caused his bed to catch fire and he suffered second-degree burns.	Quality -

Lewis et al (1998, RCT, [+]) randomised 185 hospital inpatients (non-cardiac) to one of three groups: (1) brief quitting advice from a physician (N=61); (2) counselling plus 22mg patch (N=62); or (3) counselling plus placebo patch (N=62). There were no significant differences in

point abstinence or AE rates between the patch and placebo groups. No serious adverse events (SAEs) were reported.

Molyneux et al (2003, RCT, [+]) randomised 274 inpatients to usual care (N=92), counselling alone (N=91), or counselling plus NRT (N=91). A choice of 5 NRT products was offered to the smokers (patch, gum, inhalator, tablet or spray). Eighty-nine adverse events (AEs) were reported in 65 patients. There were no significant differences in the number of AEs between treatment groups.

Murray et al (1996, RCT, [++]) report on safety of nicotine gum use in participants of the Lung Health Study. Participants, diagnosed with early stage COPD, were randomised to a smoking cessation intervention, which included the use of 2mg nicotine gum (N=3,923), or usual care (N=1,964). Patients had the option of using the gum for the duration of the study period (5 years). Using gum long-term did not predict any fatal or non-fatal cardiovascular events, nor was it associated with hospitalisation. There was also no risk associated with concomitant gum use and smoking.

Murray et al (2009, cohort follow-up [+]) compared Lung Health Study patients who did (N=1986) and did not (N=1,329) use nicotine chewing gum in incidence of cancer over 7.5 years. Smoking status during the study was a significant predictor of lung cancer, but use of NRT had no effect.

In a general review **Wagena et al. (2003, general review, +)** summarised the findings of the Lung Health Study on the safety of NRT and concluded that NRT increases abstinence rates when used in smokers with COPD and has a good safety profile.

Two studies concerned the effect of renal impairment on nicotine clearance

Molander et al (2000, prospective cohort, [+]) recruited 15 patients with chronic renal failure and 9 healthy subjects. Eighteen of the patients smoked cigarettes and six used wet snuff. Each participant was given an intravenous infusion of nicotine (0.028 mg/kg) over a 10-minute period. There was a significant correlation between the degree of renal impairment and total nicotine clearance. Patients with severe renal impairment had lower renal and non-renal clearance of nicotine. Conversely these patients also showed highest area under the curve (AUC) 64.3 +/- 43.9 ng.h/ml compared with 23.5 +/- 6.8 ng.h/ml in healthy subjects.

Whiss et al. (2000, prospective cohort, [+]) enrolled 7 patients with renal failure and 7 health subjects to examine the effect of nicotine on platelet function. All participants were tobacco users (10 cigarette smokers, and 4 wet snuff users) who were asked to abstain from tobacco use for 36 hours prior to receiving an IV infusion of nicotine (0.028 mg/kg over 10 minutes). Blood samples for platelet analysis were taken immediately before and after, and again 2 hours after the nicotine infusion. Blood samples for nicotine and cotinine analysis were also collected. Plasma concentrations of nicotine over time were not statistically different between groups. Cotinine levels however were significantly higher ($p<0.05$) at all time points in patients with renal failure. Nicotine caused increased platelet responsiveness in both groups, with no significant differences in platelet function between groups.

Two studies examined the effect of nicotine on insulin secretion and its actions.

Axelsson et al. (2001, randomized cross-over study, [+]) studied 6 patients with type 2 diabetes and 6 healthy subjects matched for sex, age and BMI. They were given either an infusion of nicotine or saline in two experimental sessions. Smoking status of the participants was not reported. There were no significant differences in plasma levels of insulin or glucose under the two conditions. The levels of free fatty acids (FFA) were significantly higher during the nicotine infusion compared to saline ($p<0.01$). Insulin sensitivity was lower in the diabetics compared to controls during both sessions. In the patients with diabetes the nicotine infusion was associated with lower insulin sensitivity than seen with the saline infusion.

Epifano et al. (1992, randomized cross-over study, [+]) randomly allocated 12 smokers with type 2 diabetes to participate in each of 3 conditions (smoking one cigarette per hour; abstaining using a 21mg patch; and abstaining using a placebo patch) after overnight abstinence. Each study condition was undertaken over 2 days, with 5 days between them. The patch and smoking did not affect insulin secretion any differently than placebo. Hepatic glucose production was suppressed less by high insulin after smoking than by the patch ($p<0.05$). In turn the patch suppressed glucose production less than placebo ($p<0.05$). Similarly, smoking was associated with significantly lower stimulation of glucose utilisation compared to the patch, which in turn produced lower stimulation of glucose stimulation than placebo ($p<0.05$ for both comparisons). Smoking (and to a significantly lesser extent the patches) affect insulin resistance, but not insulin secretion.

One case study reported on a potential risk of nasal spray use in asthma.

Roth et al (2002, case study, [-]) describes a case of a 58-year-old man who experienced exacerbation of his asthma and required hospitalisation for 48 hours, after using nicotine nasal spray.

One study and four case studies concern the effects of smoke-free hospital environment on smokers.

Carmel (2007, case study, -) reports on 2 smokers with severe dementia who developed agitation. Both were treated with a nicotine patch that alleviated agitation.

Gallagher (1998, case study, [-]) reports on 2 cases of patients with terminal cancer who were formally heavy smokers. They both developed delirium whilst in palliative care which resolved when NRT was provided.

Rigotti et al (2000, prospective cohort, [+]) studied a cohort of 650 patients who participated in a RCT of an inpatient smoking cessation programme. During the study the hospital adopted a smoke-free policy meaning that smoking was restricted to outside. The majority of the participants (89%) reported at least one tobacco withdrawal symptom in the first 24-48 hours after admission. Over half (57%) found it easy to abstain in hospital, 29% reported that it was difficult or very difficult. Only 17% reported smoking whilst in hospital. Greater ratings of craving ($p<0.001$), and restlessness ($p=0.011$) were associated with smoking whilst hospitalised.

Rosin et al (2001, case study, [-]) report on four patients (2 former smokers, 2 non-smokers) with dementia who developed agitation while in a smokefree hospital. All patients were treated with a 7mg patch with subsequent decreases in agitation. One case showed deterioration in clinical state when the patch was removed.

Zabaneh (1994, case study [-]) reported a case of a 36-year old man who smoked and was admitted to hospital with acute cholecystitis. A day after admission he became irritable, anxious and restless. He was denied permission to smoke but smoked anyway. His cigarette, combined with his oxygen therapy, caused his bed to catch fire and he suffered second-degree burns.

INTERPRETATION

This diverse group of studies did not identify any further risks of NRT use. Most smokers hospitalised in smoke-free hospitals experience some degree of tobacco withdrawal symptoms, but this is mostly mild and only a minority finds abstinence in this setting difficult.

SECTION 2: EFFECTS OF TOBACCO WITHDRAWAL ON THEOPHYLLINE, AMINOPHYLLINE, AND INSULIN

Smoking and stopping smoking have an effect on the metabolism of a number of medicines.

Our literature search found three studies concerning theophylline and aminophylline (theophylline ethylenediamine) as well as a case report of theophylline toxicity following smoking cessation. We also identified two studies concerning insulin. These studies are summarised in Table 11.

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Table 11: Summary of studies included in part 3 section 2

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Eldon et al. 1987	Cross-over trial	USA. 12 healthy male smokers randomly allocated to a 36-hour period of abstinence or smoking. After the first 24 hours they were administered an aminophylline infusion.	Theophylline plasma concentration	No significant differences in plasma theophylline levels between the two conditions.	Quality +
Lee et al (1987)	Quasi-experimental	USA (research lab setting) 14 healthy smokers in 2 conditions. Group 1 (n=7): days 1-7 smoking, days 8-14 abstaining, days 15-22 smoking. Theophylline	Theophylline plasma concentration, clearance (CL) and half life	CL significantly reduced and half life significantly increased during abstinence In both groups	Quality +

		infusion on days 7, 14 and 22. Group 2 (n=7) same procedure, but 4mg gum on abstaining days.			
Mayo et al (2001)	Case control	Canada 31 children receiving IV aminophylline, with smoking parents. Age and gender matched control group (n=31) without smoke exposure.	Duration of hospital stay and steady state plasma concentration of aminophylline	Hospitalisation was longer and plasma concentration lower in case vs. control.	Quality +
Rao (1996)	Case study	USA 65-year-old woman with emphysema on oral theophylline. Stopped smoking for 9 months, admitted with weakness, nausea and vomiting.		Congestive heart failure, later seizures. Serum theophylline level was 45.2 ug/ml (therapeutic range 10-20 ug/ml)	Quality -
Muhlhauser et al (1984)	Randomised cross-over trial	West Germany 8 healthy smokers given 2 types of insulin with and without smoking after overnight abstinence.	Serum insulin (mU/L)	No differences in serum insulin	Quality +
Klemp et al (1982)	Quasi experimental	Denmark 9 diabetic smokers, abstained overnight, given iodine-labelled insulin before and after smoking	Disappearance (half time) of iodine-labelled insulin	113% decreased absorption of insulin during smoking	Quality +

THEOPHYLLINE AND AMINOPHYLLINE

Eldon et al. (1987, cross-over trial, [+]) recruited 12 healthy male smokers who were randomly allocated to a 36 hour period of abstinence or smoking. After the first 24 hours they were administered an aminophylline infusion and had blood samples collected over a 12 hour period. They participated in the other condition a week later. There were no significant differences in plasma theophylline levels between the two conditions.

Lee et al (1987, quasi-experimental, [+]) allocated 14 healthy smokers to two conditions. Group 1 (n=7): day 1-7 smoking, day 8-14 abstaining, and days 15-22 smoking. Theophylline infusion was given on days 7, 14 and 22. Group 2 followed the same procedure, but chewed 4mg gum (1 piece/hr) on abstaining days. In Group 1, clearance was reduced by 38% ($p<0.001$) and half-life of theophylline was increased by 36% ($p<0.05$) during abstinence. In Group 2, clearance decreased and half-life increased by 32% ($p<0.05$) and 40% ($p<0.05$) respectively. The authors recommend that in smokers who stop smoking, theophylline dose should be reduced by a quarter to a third. The results suggest that this is not due to nicotine.

Mayo (2001, case control study, [+]) studied 31 children aged 1 to 9 receiving IV aminophylline for 48 hours who had smoking parents. A matched control group of 31 children had no second hand smoke exposure. Mean duration of hospitalisation case vs. Control was 4.4 vs. 2.9 days ($p<0.05$). Steady state plasma concentration of aminophylline in cases versus controls was 55.3 vs. 73.2 umol/L ($p<0.0001$). CL in cases vs. control was 1.36 vs. 0.90 ($p<0.00001$).

Rao (1996, case study, [-]) described a case of a 65 year old woman with emphysema, taking sustained released theophylline (200mg twice daily). She had stopped smoking 9 months ago and was admitted with weakness, nausea and vomiting. She had congestive heart failure and later developed seizures. Her serum theophylline level of 45.2 ug/ml (therapeutic range is 10-20 ug/ml) was considered the cause.

INSULIN

Klemp et al. (1982, quasi-experimental, [-]) gave 9 diabetic smokers iodine-labelled insulin after overnight abstinence. Ninety minutes later they were allowed to smoke a cigarette. Half time measured 30 mins before smoking was 158 +/- 22 mins. In the period during smoking half time increased to 336 +/- 97 mins ($p<0.05$) representing a 113% decrease in insulin absorption. In the first 30 minutes after smoking the half-life was still significantly higher than at baseline, 207 +/- 29 mins ($p<0.05$).

Muhlhauser et al. (1984, quasi-experimental, [-]) randomly allocated 8 healthy male smokers to 4 conditions over 10 days after overnight abstinence from smoking: (1) Neutral insulin with smoking; (2) Neutral insulin without smoking; (3) Mixtard insulin with smoking; and (4) Mixtard insulin without smoking. During the smoking conditions subjects smoked one cigarette 2.5 minutes before and one cigarette 5 minutes after insulin injection. There were no significant differences in serum insulin concentrations between smoking and non-smoking conditions.

INTERPRETATION

Two experimental studies of theophylline use in healthy subjects report conflicting results. However the study that found no difference examined changes over a very short period of abstinence. The remaining data suggest that theophylline levels are sensitive to smoking and abstinence, with increase clearance and decreased half-life following smoking cessation. Aminophylline levels are influenced even by passive smoking. In patients who change their smoking status, doses of these drugs need to be monitored and adjusted. The changes are caused by chemicals in cigarette smoke other than nicotine.

Two small studies of insulin from 1980's examined only acute effects of smoking and they report conflicting results.

SECTION 3: EFFECTS OF SMOKING AND SMOKING CESSATION ON ULCERATIVE COLITIS

Ulcerative colitis (UC) is an inflammatory disease of the colon, which is seen primarily in non-smokers and ex-smokers. Smoking seems to be beneficial for UC, possibly because nicotine might reduce the expression of cytokines that promote inflammation.

Our literature search identified 12 relevant studies, summarised in Table 12.

Table 12: Summary of studies included in part 2 section 3

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Bastida et al. (2011)	General review	General review of the association of smoking and smoking cessation with UC		Smoking cessation patients with UC may cause worsening of symptoms	Quality +
Beaugerie et al (2001)	Retrospective cohort	France 32 patients who quit smoking at some time following their diagnosis of UC	Signs and symptoms of UC	Smoking cessation was associated with a flare up of the disease ($p<0.01$) and longer duration of medical treatment ($p<0.01$).	Quality -
Green et al (1998)	Retrospective cohort	UK 51 patients (all current smokers) with verified ulcerative colitis, which had developed when they were either non-smokers or ex-smokers.	Review of development of UC and control of disease whilst smoking	19 report developing UC within two years of smoking cessation. Most (n=28) believed that smoking improved symptoms associated with UC.	Quality -
Guslandi et al (1998)	Randomised controlled trial	Italy 38 patients in remission of UC (no current smokers) randomised to a 5-week course of 15mg nicotine patch (n=21) or oral prednisone.	Signs and symptoms of UC The first 15 patients with remission followed up for further 6 months.	UC relapse less common in patch group (20%) vs. the prednisone group (60%), p=0.027. No difference in remission (15/21 vs. 15/17) at end of treatment.	Quality +
Guslandi et al (2002)	Randomised controlled trial	Italy 30 UC patients, who were non-smokers maintained on a mesalamine 4g enema, to 15mg nicotine patch or oral mesalamine for 4 weeks	Clinical remission	Remission was greater in patch users (12/15; 80%) than those on mesalamine (5/15; 33%), p=0.027.	Quality +
Ingram (2005)	Randomised controlled trial	UK 104 patients with UC to a 6-week treatment course of 6mg nicotine or placebo enemas, in addition to their standard UC therapy.	Clinical remission	No difference in clinical remissions was observed between the groups (p=0.55).	Quality +
McGarth et al (2009)	Systematic review	Included 5 of 9 RCTs assessing the effects of nicotine patches for	Clinical or sigmoidoscopic remission,	Showed a significant benefit of patches compared to placebo in clinical remission.	Quality ++

		induction of remission of UC.	adverse events		
Nickfar et al (2011)	Systematic review	Investigated the effect of nicotine preparations in the treatment of active UC.	Clinical remission	No difference in efficacy NRT in achieving clinical remission of UC compared to placebo or corticosteroids.	Quality +
Pullan et al (1994)	Randomised controlled trial	UK 72 patients with UC to a 6-week course of 15-25mg patch (n=35) or placebo (n=37).	Clinical remission	More patients in the patch group (17/35) than in the placebo group (9/37) had complete remission (p=0.03).	Quality +
Sandborn (1997)	Randomised controlled trial	USA 64 non-smoking UC patients to a 4-week course of 22mg patches (n=31) or placebo (n=33).	Clinical improvement and remission	More patients on patch showed improvement (p = 0.007). No difference in remission rates.	Quality +
Thomas et al (1996)	Randomised controlled trial	UK 61 patients with active UC randomized to 6-weeks treatment with nicotine patch (15-25 mg/day) or oral prednisolone.	Sigmoidoscopic remission	More patients in the prednisolone group achieved full remission p<0.05	Quality +
Wahed et al. (2011)	Retrospective cohort	UK 73 UC patients (9 smokers)	Beneficial effects of smoking on their disease	Only 21% were aware of the beneficial effects of smoking on their disease, and the knowledge was not related to smoking status.	Quality -

We found 6 randomised trials of NRT in patients with UC.

Guslandi et al (1998, RCT, [+]) randomised 38 patients in remission of UC, none of whom were current smokers, to a 5-week course of 15mg nicotine patch (n=21) or oral prednisone. The first consecutive 15 patients with signs of remission were followed up for a further 6 months. Relapses of UC were significantly less common in the patch group (20%) vs. the prednisone group (60%), p=0.027. There was no significant difference between the groups in remission (15/21 vs. 15/17) at the end of treatment.

Guslandi et al (2002, RCT, [+]) randomised 30 UC patients, who were non-smokers maintained on a mesalamine 4g enema, to 15mg nicotine patch or oral mesalamine for 4 weeks. Remission was greater in patch users (12/15; 80%) than those on mesalamine (5/15; 33%), p=0.027.

Ingram (2005, RCT, [+]) randomised 104 patients with UC to a 6-week treatment course of 6mg nicotine or placebo enemas, in addition to their standard UC therapy. No difference in clinical remissions was observed between the groups (14 of 52 receiving nicotine vs. 14 of 43 receiving placebo, p=0.55).

Pullan et al (1994, RCT, [+]) randomised 72 patients with UC to a 6 week course of 15-25mg patch (n=35) or placebo (n=37). At the end of the study period more patients in the patch group (17/35) than in the placebo group (9/37) had complete remission (p=0.03).

Sandborn (1997, RCT, [+]) randomised 64 non-smoking UC patients to a 4-week course of 22mg patches (n=31) or placebo (n=33). A higher proportion of patients in the patch group

(12/31) showed clinical improvement than patients using placebo (3/33), p = 0.007. There was no significant difference in remission rates (2/31 vs. 0/33).

Thomas et al (1996, RCT, [+]) compared the effects of nicotine patch (15-25 mh/day) with oral prednisolone in a RCT in 61 patients with active UC. Both treatments were used for 6 weeks. Significantly more patients in the prednisolone group (14/31) achieved full remission compared to those in the nicotine group (6/30), p<0.05.

We found two reviews of these RCTs. A Cochrane Review **(McGarth et al. 2009, [++])** included five RCTs in a meta-analysis. Pooling the results of the two placebo controlled trials showed a significant benefit of nicotine patches compared to placebo in clinical remission (OR=2.56, CI: 1.02-6.45). Three trials compared patches with standard therapy, showing no significant difference in outcomes (OR=0.90, CI: 0.12-6.94). Patients treated with NRT were more likely to withdraw from treatment than those using placebo or standard treatment (OR=5.82, CI: 1.66-20.47).

Nikfar et al. (2010, [+]) conducted a systematic review and meta-analysis and included 5 randomised controlled trials; four were included in the Cochrane review (Pullan et al 1994; Thomas et al 1996; Sandborn et al 1997; Guslandi & Tittobello 1998) and one additional trial that investigated the use of a nicotine enema (Ingram et al 2005). The meta-analyses found no effect of nicotine compared to placebo, on clinical remission (relative risk = 1.40, 95%CI:0. 63-3.12), but it also found no difference between the effects of NRT and corticosteroids (RR=0.74, 95%CI: 0.5-1.09).

We found four other publications relevant for the topic.

In a general review of the topic **Bastida et al. (2011, general review, +)** concluded that smoking cessation in a patient with UC may cause worsening of symptoms and that such patients should receive information regarding the risks of continued smoking versus those associated with stopping. In the authors' opinion, given the increasing number of available treatments for exacerbations of UC and the risks of continuing to smoke, patients with UC should be advised and assisted to stop.

Beaugerie et al (2001, retrospective cohort, [-]) reported on 32 patients who quit smoking at some time following their diagnosis of UC. Smoking cessation was associated with a flare-up of the disease (p<0.01) and patients who quit were more likely to require medical treatment for longer (p<0.01). There was no difference in the risk of needing colectomy.

Green et al (1998, retrospective cohort, [-]) collected data from a cohort of 51 UC patients who were smokers. Their disease had developed when they were either non-smokers or ex-smokers. Nineteen reported developing UC within two years of stopping smoking. Most (N=28) believed that smoking improved their symptoms.

Wahed et al. (2011, retrospective cohort, [-]) reported that in a sample of 73 UC patients (of which 9 were smokers), only 21% were aware of the beneficial effects of smoking on their disease, and the knowledge was not related to smoking status.

INTERPRETATION

Nicotine patches, but not nicotine enema, have a positive effect on ulcerative colitis. Nicotine treatment however is not more effective than standard treatment and causes more

side effects in non-smokers. Ulcerative colitis sufferers who smoke can expect worsening of their symptoms if they stop smoking.

Evidence Statements 1.3

Safety of NRT in medically stable patients

This diverse group of studies did not identify any further risks of NRT use.

ES 1.3.1 There is strong evidence that the use of NRT in medically stable patients is not associated with an increased risk of adverse events (Lewis et al 1998, RCT, [+]; Molyneux et al 2003, RCT, [+]; Murray et al 1996, RCT, [++]; Murray et al 2009, prospective cohort, [+], Wagena et al. 2003, general review, [+])

ES 1.3.2 There is moderate evidence that renal disease can impair nicotine clearance (Molander et al 2000, prospective cohort, [+]; Whiss et al. 2000, prospective cohort, [+])

ES 1.3.3 There is moderate evidence that nicotine use in patients with renal disease does not adversely affect platelet function (Whiss et al. 2000, prospective cohort, [+])

ES 1.3.4 There is moderate evidence that nicotine has little effect on insulin secretion (Epifano et al. 1992, randomized cross-over study, [+]; Axelsson et al. 2001, randomized cross-over study, [+])

ES 1.3.5 There is moderate evidence that medicinal nicotine is associated with insulin resistance, although significantly less so than smoking (Epifano et al. 1992, randomized cross-over study, [+]; Axelsson et al. 2001, randomized cross-over study, [+])

Effect of smoking abstinence on hospitalised smokers

Most smokers hospitalised in smoke-free hospitals experience some degree of tobacco withdrawal symptoms, but this is mostly mild and only a minority find abstinence in this setting difficult.

ES 1.3.6 There is moderate evidence that smokers who cannot smoke in hospital can experience some tobacco withdrawal symptoms (Rigotti et al 2000, prospective cohort, [+]; Zabaneh 1994, case study [-]; Carmel 2007, case study, [-]; Gallagher 1998, case study, [-]; Rosin et al 2001, case study, [-])

Effects of tobacco withdrawal and nicotine on theophylline and aminophylline

Theophylline levels are sensitive to smoking and abstinence and aminophylline levels are influenced even by passive smoking. In patients who change their smoking status, doses of these drugs need to be monitored and adjusted.

ES 1.3.7 There is moderate evidence that theophylline levels are sensitive to smoking and abstinence (Lee et al 1987, quasi-experimental, [+]; Rao 1996, case study, [-]) and aminophylline levels are influenced even by second hand smoke (Mayo et al. 2001, case control study, [+]). One study, Eldon et al. 1987 (cross-over trial, [+]), showed no effect of a 36-hour period of abstinence on serum theophylline levels.

ES 1.3.8 There is moderate evidence that nicotine does not influence theophylline levels (Lee et al 1987, quasi-experimental, [+])

EFFECTS OF TOBACCO WITHDRAWAL AND NICOTINE ON SUB-CUTANEOUS INSULIN

There are inconsistent data regarding the effect of smoking on the absorption of insulin, and no data regarding the effect of NRT on insulin absorption.

ES 1.3.9 There are inconsistent data regarding the interaction between subcutaneous insulin and smoking (Klemp et al. 1982, quasi-experimental, [+]; Muhlhauser et al. 1984, quasi-experimental, [+])

EFFECTS OF TOBACCO WITHDRAWAL AND NICOTINE ON ULCERATIVE COLITIS

Effects of nicotine on ulcerative colitis

ES 1.3.10 There is strong evidence that NRT can have positive effects on ulcerative colitis (Guslandi et al 1998, RCT, [+]; Guslandi et al 2002, RCT, [+]; Ingram 2005, RCT, [+]; Pullan et al 1994, RCT, [+]; Sandborn 1997, RCT, [+]; Thomas et al 1996, RCT, [+]; McGarth et al. 2009, systematic review [++]; Nikfar et al. 2010, systematic review [+])

Effects of smoking cessation on ulcerative colitis

ES 1.3.11 There is moderate evidence that smokers with ulcerative colitis experience worsening of their symptoms when they stop smoking (Bastida et al, review (+), Beaugerie et al 2001, retrospective cohort, [-]; Green et al 1998, retrospective cohort, [-]; Wahed et al. 2011, retrospective cohort, [-])

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CHAPTER 2

Effects of nicotine use and effects of tobacco withdrawal in patients with mental illness

INTRODUCTION

The main hypothesis for why smoking rates are exceptionally high in people with mental health illness is that they smoke to alleviate some of the symptoms associated with their illness (Aubin et al 2012). The concern is therefore that when such patients stop smoking, either of their own accord or because they are forced to abstain, their functioning may deteriorate (Aubin 2009; Hughes 1993).

There is also a specific concern that concurrent stopping smoking may undermine the efficacy of treatments for patients with alcohol and drug addictions.

Finally, smoking affects the speed with which a number of psychiatric drugs are metabolised and stopping smoking may lead to an increase in drug side effects (Kroon 2007).

Below we present data from 92 studies concerning the effects of abstinence and of stop-smoking treatments on psychiatric symptoms and psychiatric medications, and also on the effects of smoking cessation on treatment outcome of other drug dependencies. The material is organised into the following sections:

1. Section 1: Effects of tobacco abstinence and effects of stop-smoking medications on mental health
2. Section 2: Effects of tobacco abstinence on psychiatric medications
3. Section 3: Effects of smoking cessation on the outcome of other substance abuse treatment;
4. Section 4: Effects of smoke free policy on behaviour and psychiatric symptoms of psychiatric in-patients.

A brief interpretative summary of findings is provided at the end of each section, and evaluation and evidence statements are at the end of the Chapter.

SECTION 1: EFFECTS OF SMOKING CESSATION AND EFFECTS OF NRT ON PSYCHIATRIC SYMPTOMS

We found literature concerning the impact of stopping smoking on several conditions, including post-traumatic stress disorder, schizophrenia, and depression. We review the studies concerning these three conditions separately, and cover systematic reviews of the topic at the end. Twenty-nine studies covered in Part 1 are presented in Table 13 below.

Table 13: Summary of studies included in Chapter 2 Section 1

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes

Allen et al (2011)	Randomised double blind placebo controlled trial	USA 40 smokers with high agitation on admission to a psychiatric ward, received nicotine patch or placebo.	Agitated Behaviour Scale (ABS), Overt Aggression Scale, + and - Symptom Scale (PANSS); at baseline, 4 and 24 hrs.	ABS score decreased over 24h in both groups. PANSS excited component score decreased more in patch group.	Quality +
Baker et al (2006)	Randomised controlled trial	Australia 298 psychiatric outpatients with non-acute illness given patch or usual care.	Abstinence, change in symptoms measured with BDI, BPRS, STAI, SF-12	No changes in BPRS scores. SF-12 and BDI scores lower than baseline in the intervention group at all time points.	Quality + No comparison of quitters vs. smokers
Banham & Gilbody (2010)	Systematic Review	Included 9 papers, from 8 RCTs examining the efficacy of smoking cessation interventions for people with severe mental health illness	Abstinence from smoking and data regarding psychiatric symptoms were also extracted	Psychiatric symptoms were largely not different between intervention and control groups	Quality + Does not analyse effects of abstinence
Benazzi & Mazzoli (1994)	Case study	Italy 40-year old man with a history of psychotic illness		Presented with psychosis following smoking cessation	Quality -
Blalock et al (2008)	Prospective cohort study	USA 21 depressed smokers on patch + behavioural counselling or mood management counselling	Abstinence (CO validated) and PANSS and BDI to measure psychiatric symptoms	9 patients quit and showed significant improvement in the PANSS positive symptoms score and BDI	Quality + (- in terms of study design, but + in terms of usefulness of data)
Bock et al (1996)	Case studies	USA Three women who developed significant depression following smoking cessation			Quality -
Dalak et al (1999)	Randomised double blind cross over study	USA 10 smokers with schizophrenia given 22mg or placebo patch over 2-days. They could smoke ad lib. 5-day wash out	Blood nicotine levels, CO, psychiatric symptoms, withdrawal symptoms	Patch use reduced CO by 15%. No effect on psychiatric symptoms.	Quality +
Evins et al (2001)	Randomised controlled trial	USA 18 outpatients with schizophrenia used either bupropion or placebo with a 12-week group CBT intervention	Abstinence and change in psychiatric symptoms	BPRS scores decreased on bupropion and increased on placebo. Depressive symptoms improved on bupropion.	Quality +
Evins et al (2005a and 2005b) 2 papers related to the same study	Randomised controlled trial	USA 53 smokers with schizophrenia. 12-week CBT plus bupropion or placebo.	Abstinence and change in psychiatric symptoms. 2005b reports on tests of cognitive functioning.	Greater reductions in PANSS depressive and cognitive subscales in bupropion group. No deterioration on cognitive measures.	Quality +
Evins et al (2007)	Randomised placebo	USA 51 smokers with	Abstinence (CO validated) and	No effect on abstinence or psychiatric symptoms	Quality +

	controlled trial	schizophrenia on nicotine patch and allocated to 12-week bupropion or placebo	psychiatric symptoms		
Fatima et al (2005)	Randomised cross over trial	10 outpatients with schizophrenia or schizoaffective disorder given bupropion or placebo for 21 days	Abstinence (CO validated) and psychiatric symptoms	A non-significant reduction in CO levels, no effect on psychiatric symptoms	Quality +
Gallagher et al (2007)	Randomised controlled trial	USA 181 patients with schizophrenia and other severe illnesses. Contingent reinforcement (CR), CR plus NRT; or self-quitting.	CO validated abstinence and psychiatric symptoms (Brief Symptom Inventory BSI. Followed up at 36 weeks	No effect on abstinence or BSI.	Quality +
George (2000)	Randomised controlled trial	USA 45 smokers with schizophrenia, nicotine patches plus group treatment programme (GTP) for patients with schizophrenia or standard GTP.	Abstinence rates and psychiatric symptoms measured by AIMS, BDI, PANSS, and WEPS	No effect on abstinence. Patients in the specialist GTP had lower PANSS negative symptom scores.	Quality +
George et al (2002)	Randomised placebo controlled trial	USA 32 patients with schizophrenia or schizoaffective disorder received bupropion or placebo	Abstinence (CO validated) at 6-months. Psychiatric symptoms: PANSS, BDI, AIMS, WEPS.	Abstinence higher in bupropion group. No effect on positive PANSS score, but decreases in negative symptoms greater on bupropion	Quality +
George et al (2008)	Randomised controlled trial	USA 58 outpatients with schizophrenia or schizoaffective disorder received 10 week bupropion + patch, or placebo + patch	Abstinence (CO validated) and psychiatric symptoms (PANSS and BDI)	Significant effect on abstinence. No effects of abstinence on psychiatric symptoms.	Quality +
Hill & Chang (2007)	Case series	USA 9 psychiatric outpatients in group-based CBT or group based CBT plus NRT	BDI at baseline and monthly for 3 months	No effect on cigarette consumption or BDI	Quality -
Jenkusky 1993	Case study	USA 27-year-old woman with schizoaffective disorder admitted with anxiety, agitation and nausea		Wore a nicotine patch whilst smoking	Quality -
Lundberg et al (2004)	Case studies	USA 5 patients with obsessive-compulsive disorder treated with NRT gum for 8 weeks	Yale-Brown Obsessive-Compulsive Scale (YBOCS)	4 patients showed improvement, 3 reported mild side effects of the gum	Quality -
McFall et al (2005)	Randomised controlled	USA 66 smokers with PTSD	Abstinence (CO validated), PTSD	No changes in symptoms and no differences	Quality +

	trial	received intervention by PTSD physicians or referral to smoking cessation clinic	checklist and Becks Depression Inventory (BDI) at 6 and 9 months	between smokers and abstainers	
McFall et al (2010)	Randomised controlled trial	USA 943 smokers with PTSD received intervention by PTSD physicians or referral to smoking cessation clinic	Abstinence (CO validated); PTSD symptoms; depressive symptoms	Abstinence rates higher in intervention group. At 18 months reductions in PTSD and depressive symptoms in both groups.	Quality ++
Moadel et al (1999)	Case study	USA 62-year-old man with depression and anxiety and bladder cancer. Smoked a pack of cigarettes a day.	He required regular cystoscopy and before each procedure he would get very anxious.	He was provided with a 14 mg patch to wear on the day of the procedure and was less anxious	Quality -
Scharf 2009	Case studies	Canada 3 psychiatric inpatients, heavy smokers		Successfully helped to stop smoking with 21mg nicotine patches	Quality -
Smith et al (2002)	Randomised cross over study	USA 30 patients with schizophrenia: (1) high nicotine cigarettes (2) denicotinized cigarettes (3) active nasal spray (4) placebo nasal spray, all after overnight abstinence	Psychiatric symptoms PANSS, SANS	Negative symptom scores raised after overnight abstinence and decreased after smoking either type of cigarette	Quality ++
Thorsteinsson et al (2001)	Randomised controlled trial	USA 38 patients with a history of major depressive disorder on patch or placebo for 2-weeks. Followed by all on placebo for 8 days.	HAM-D, BDI, Profile of Mood States (POMS) and tobacco withdrawal symptoms.	Mood rating decreased over time for abstainers. Placebo users had greater decrease in POMS scores	Quality +
Tsoi et al (2010)	Systematic Reviews	Included 21 RCTs of smoking cessation or reduction in smokers with schizophrenia or schizoaffective disorder	Abstinence rates (Russell standard), changes in psychiatric symptoms and adverse events	No significant differences in positive or negative symptoms or depressive symptoms.	Quality + No comparison of abstainers vs. smokers
Weiner et al (2011)	Randomised controlled trial	USA 9 patients with schizophrenia were received varenicline or placebo for 12 weeks.	Abstinence (CO validated) and changes in psychiatric symptoms (BPRS).	No difference between groups	Quality - Tiny sample
Williams et al (2004)	Case studies	USA 12 patients with schizophrenia using nicotine nasal spray		1 patient could not tolerate spray, most used maximum dose without problems	Quality -
Williams et al (2010)	Randomised controlled trial	USA 87 patients with schizophrenia in high or low intensity treatment for 6 months	Abstinence (CO validated) and psychiatric symptoms (BDI, PANSS)	No difference in BDI or PANSS by treatment group or by abstinence	Quality +

Patients with Post Traumatic Stress Disorder

McFall et al (2005, RCT [+]) randomised 66 patients with Post-traumatic Stress Disorder (PTSD) to a smoking cessation intervention delivered by PTSD physicians (N=33) or a referral to a smoking cessation clinic (N=33). The latter group was meant to act as the control. Overall there were no significant changes in PTSD checklist scores or Becks Depression Inventory (BDI) from baseline to 6 and 9 months follow-up, and no difference between smokers and abstainers.

McFall et al (2010, RCT [++]) randomised 943 PTSD smokers to a smoking cessation intervention, including stop-smoking medications, delivered by PTSD physicians (N=472) or a referral to a smoking cessation clinic (N=471). Twelve month abstinence rates were higher in the physician-delivered treatment group (8.9%) versus the control (4.5%), OR=2.26 (CI: 1.30-3.91). At 18 months both abstainers (n=63) and smokers (n=880) showed significant reductions in severity of PTSD and depressive symptoms. Only the change in depressive symptoms was significantly different between the groups with non-quitters worsening slightly (p=0.03). The proportion of people with SAEs did not differ between abstainers (41%) and smokers (47%, p=0.39). Only a fraction of these (2%) were considered potentially related to the study, the breakdown for abstainers and smokers is not provided.

Patients with schizophrenia or schizoaffective disorder

Allen et al (2011, RCT [+]) randomised 40 patients with acute schizophrenia with a significant level of agitation hospitalised in a smoke-free hospital to 21mg nicotine (n=20) or placebo patches (n=20). Agitation score, Overt Aggression Scale, Positive and Negative Symptoms Scale (PANSS) excited component subscale, and Richmond Agitation-Sedation Scale were administered at baseline, 4 and 24 hours later. The ABS score decreased in all patients over 24 hours (p=0.055). The decrease in PANSS score was greater in the patch vs. placebo group (p=0.01). There were no significant differences on the other scales.

Baker et al (2006, RCT [+]) randomised 298 psychiatric outpatients with non-acute illness to motivational interviewing plus 21mg patch or usual care. The intervention had no effect on smoking status. The mental health component SF-12 (p<0.001) and BDI (p<0.001) scores were significantly lower than baseline in both groups at all time points with no differences between groups. Changes by smoking status were not reported.

Dalack et al (1999, RCT [+]) studied 19 outpatients in a cross over trial. Following one day of ad libitum smoking they were randomised to 3 days of abstinence (spent at a research centre) wearing 22mg nicotine patch or placebo. There were no significant differences in numerous measures between the conditions. Repeated measures ANOVA showed an interaction between Abnormal Involuntary Movement Score (AIMS), patch type and day of abstinence. AIMS score differed significantly between patch groups at day 2 (p<0.02). Scores decreased during placebo use and increased during patch use.

Evins et al (2001, RCT [+]) recruited 18 outpatients with schizophrenia to a 12-week group-based smoking cessation intervention where they were randomized to receive either bupropion (n=9) or placebo (n=9). *Brief Psychiatric Rating Scale (BPRS)* scores decreased in bupropion users and increased in placebo users (p=0.03) over the treatment period. A similar change was seen in the Hamilton Depression Rating Scale (*HAM*-D) scores (p<0.01), showing an improvement in depressive symptoms among bupropion users. The placebo

group showed worsening depressive symptoms, although this was only significant at week 14 (p=0.002). No data are provided on the change in symptoms by smoking status.

Evins et al (2005a and 2005b, RCT [+]) randomised 53 patients to a 12-week group CBT intervention and either bupropion (n=25) or placebo (n=28). Abstinence rates were higher in the bupropion group at the end of treatment (4/25 vs. 0/28, p = 0.043). The bupropion group had greater reductions in the PANSS depressive (p=0.017) and cognitive (p=0.029) subscales that the placebo group. Nine patients achieved abstinence for 7-days and this was associated with better recall compared to those who continued to smoke (p=0.038). There was no deterioration on any cognitive measures, although there was a slowing of motor speed, as measured by finger tapping (p=0.003).

Evins et al (2007, RCT [+]) randomly allocated 51 patients with schizophrenia who wanted to quit smoking, to a 12-week course of bupropion (n=25) or placebo (n=26) in addition to CBT and nicotine patch. Barnes Akathisia Scale (BAS) scores were significantly improved in the intervention group (p=0.005). Otherwise the intervention had no effect on abstinence, and there were no differences in symptom scores between abstainers and smokers or between medication groups. There were no serious adverse events (SAEs) reported.

Fatima et al (2005, cross over trial, [+]) enrolled 10 patients into a randomised cross-over trial to use bupropion or placebo for 21 days. Patients were not instructed to quit. Bupropion use led to a non-significant reduction in carbon monoxide levels. There were no significant changes in numerous measures of psychiatric symptoms by treatment group.

Gallagher et al (2007, RCT [+]) randomly allocated 181 patients with schizophrenia and other severe mental health illnesses to (1) contingent reinforcement (CR); (2) CR plus NRT; (3) self quitting. All groups received treatment for 16 weeks and were followed up at 36 weeks. No significant difference in abstinence rates was seen between the groups, and there was no significant change in Brief Symptom Inventory (BSI) over time within and between groups. The results were similar for abstainers versus smokers (data not reported).

George et al (2000, RCT [+]) randomly allocated 45 patients to a specialized group treatment programme (GTP) (n=28) or a standard GTP (n=17). All patients received nicotine patches. The intervention had no effect on abstinence rates, but GTP was associated with lower PANSS negative symptom scores (p<0.05). Data are not presented by smoking cessation outcome.

George et al (2002, RCT [+]) randomised 32 patients with schizophrenia or schizoaffective disorder to a 10-week course of bupropion (n=16) or placebo (n=16). Abstinence rates were higher in the bupropion group (8/16) compared with placebo (2/16), p<0.05. There were no differences in positive PANSS score, but there was a decrease in negative symptoms in the bupropion group (p<0.05). There were no significant changes in the other scales. The authors do not report on change in symptoms by smoking status.

George et al (2008, RCT [+]) randomised 58 outpatients with schizophrenia or schizoaffective disorder to a 10 week course of bupropion + patch (n=29) or placebo + patch (n=29). There was a difference in abstinence rates between the intervention (8/29) and control (1/29) groups, OR=10.67, (CI: 1.24-91.98). There were no effects of abstinence on psychiatric symptoms. Three patients (1 using bupropion and 2 using placebo) had a psychotic breakdown.

Smith et al (2002, cross over trial, [++]) crossed-over 30 in-patients into (1) high nicotine cigarette (1.9mg) (2) denicotinized cigarette (0.1mg) (3) active nasal spray (NS), and (4) placebo nasal spray after overnight abstinence. Data were collected before and after

patients smoked 2 cigarettes or used NS. The negative symptoms scores were significantly raised, compared with baseline smoking, after overnight abstinence. Smoking either type of cigarette resulted in a decrease in all of the negative symptom measures ($p<0.006$). However the high nicotine cigarette produced a greater decrease in some of them than the denicotinised cigarette. Active NS increased scores in tests of verbal memory compared with placebo ($p<0.05$). Neither NS had any other effects.

Weiner et al (2011, RCT [-]) randomised 9 patients to varenicline (n=4) or placebo (n=5) for 12 weeks. Varenicline users had marginally higher activation score than placebo users ($p=0.06$). There were no serious adverse events reported.

Williams et al (2010, RCT [+]) randomly allocated 87 smokers with schizophrenia or schizoaffective disorder to 24 smoking cessation sessions over 6 months (N=45) or 9 sessions only (N=42). This had no effect on 6-month abstinence rates (7/45 vs. 8/42, $p=0.78$) or scores of BDI or PANSS (p-values>0.4). Abstinence status had no effect on psychiatric scores either.

CASE STUDIES

Benazzi & Mazzoli (1994, case study [-]) describe a 40-year old man with a history of psychotic illness who presented with psychosis following smoking cessation.

Jenkusky (1993, case study [-]) reports on a 27-year-old woman with schizoaffective disorder who was admitted to a psychiatric service with anxiety and agitation. She also complained of nausea. She was subsequently found to be wearing a nicotine patch and concurrently smoking.

Scharf (2009, case study [-]) presents three cases of psychiatric in-patients who were successfully treated with 21mg patches.

Williams et al (2004, case study [-]) report on 12 patients with schizophrenia who used nicotine nasal spray to hep them quit smoking. Only one patient could not tolerate this treatment and most (n=9) used it at its maximum dose without any adverse effects.

PATIENTS WITH DEPRESSIVE DISORDER

Blalock et al (2008, prospective cohort [+]), in a non-randomised trial, allocated 21 smokers with current depressive disorders to behavioural counselling (n=9) or mood management counselling (n=12). Both groups received 21mg nicotine patches. Nine patients achieved prolonged abstinence and showed an improvement from baseline in the PANSS positive symptoms score ($p=0.003$) and BDI ($p=0.008$).

Thorsteinsson et al (2001, RCT [+]) randomised 38 patients with a history of major depressive disorder, not currently treated, to 21mg/24 hr. patch (n=18) or placebo (n=20) for a 2-week treatment period. Change in psychiatric symptoms data are only presented for 24 abstainers (13 patients relapsed and 1 patient in the placebo group developed depression and was withdrawn). Mood improved over time in both groups. Only the POMS scores showed a difference between groups, with the placebo group showing a greater improvement ($p<0.05$).

CASE STUDIES

Bock et al (1996, case study [-]) report three case studies, all women, who developed significant depression following smoking cessation.

Hill & Chang (2007, case study [-]) report on 9 patients attending a psychiatric outpatient clinic and receiving CBT smoking cessation treatment (n=6) or CBT plus NRT (n=3). Patients in both groups reported reducing their cigarette consumption. Their BDI scores deceased over time, although these changes were not statistically significant.

Lundberg et al (2004, case study [-]) describe five cases of patients with obsessive-compulsive disorder who were treated with nicotine chewing gum for 8 weeks. Four patients showed an improvement in their illness, as measured on the Yale-Brown Obsessive-Compulsive Scale (YBOCS). Three patients reported mild side effects of the gum.

Moadel et al (1999, case study [-]) present a case of a 62 year old male smoker with depression and anxiety who required regular cystoscopy for bladder cancer and who would get very anxious before each procedure. When he was provided with a 14 mg patch to wear on the day of the procedure, he was less anxious.

SYSTEMATIC REVIEWS

Tsoi et al (2010a, systematic review [+]) reviewed 21 RCTs of smoking cessation or reduction in smokers with schizophrenia or schizoaffective disorder. Nine of these trials were relevant to this review and are presented above. The others reported smoking cessation outcomes only. The review focused on the efficacy of stop-smoking interventions rather than on the impact of stopping smoking on mental health status.

Tsoi et al (2010b, systematic review [+]) reviewed 7 studies of bupropion for smoking cessation or reduction. Only 5 could be included in the meta-analysis, the other two (Weiner et al, 2007 and Li et al., 2009) provide abstracts only. The included five trials, described above, showed a marginal effect of bupropion on abstinence at 6-months (Risk Ratio=2.78, CI: 1.02-7.58). Mental state outcomes (positive, negative, and depressive symptoms) from 3 studies could be pooled and compared between bupropion groups and controls. There were no differences in positive, negative, or depressive symptoms. No studies reported seizures. Symptoms such as dry mouth were more frequently reported in the bupropion groups ($p<0.05$). Mental health outcomes in smokers and abstainers were not compared.

Banham & Gilbody (2010, systematic review [+]) reviewed data from 9 papers, including 8 RCTs, examining the efficacy of smoking cessation interventions for people with severe mental health illness. Psychiatric symptoms did not differ greatly between the intervention and control groups, although data could not be pooled for meta-analyses and no comparison between smokers and abstainers is provided.

INTERPRETATION

Most of the experimental studies reviewed above had methodological problems, including small sample sizes, large numbers of measures, and unclear outcomes. Most of the smoking cessation trials generated very few abstainers and had insufficient power to detect other than large effects. Studies usually only analysed differences between the randomized groups. As most patients across the randomized conditions continued to smoke, such comparisons

were not examining changes in mental health due to abstinence. Some studies however produced interpretable findings.

Regarding PTSD, stopping smoking seems to generate no deterioration of the condition.

Regarding schizophrenia, abstinence from smoking can induce some discomfort acutely and possibly increase agitation. There are a few case reports of smoking cessation coinciding with deterioration in mental health. However, no evidence emerged from experimental studies that stopping smoking leads to the worsening of mental health status in patients who achieve longer-term abstinence. This needs to be considered as a tentative conclusion, as only a few studies analysed such outcomes and these had only small samples of abstainers. It is possible that patients who experienced negative effects of abstinence returned to smoking. Nevertheless, it is reassuring that in the small proportion of patients who do manage to achieve abstinence, no deterioration of mental health was observed.

Regarding depression, there is some evidence that mood improves in patients who manage to stop smoking compared to those who fail in their quit attempt and continue to smoke.

Nicotine patches may decrease agitation in acutely ill smokers hospitalised in smoke-free hospitals, though one study suggested that they may increase involuntary movements, and another reported better mood improvements in successful quitters who used placebo compared to nicotine patches. It should be noted however that anti-psychotic drugs can cause involuntary movements, and it is possible that the effect noted in this one study may be due to the increase in plasma levels of these drugs following smoking cessation.

SECTION 2: EFFECTS OF STOPPING SMOKING ON PSYCHIATRIC MEDICATION

Smoking and stopping smoking have an effect on the metabolism of a number of psychiatric drugs. Below we review the existing literature on the effects of smoking and stopping smoking on benzodiazepines, carbamazepine, chlorpromazine, clozapine, fluphenazine, haloperidol, methadone, olanzapine, perphenazine, quetiapine, selective serotonin reuptake inhibitors (SSRIs), thioridazine, thiothixene, tricyclic antidepressants, zotepine and zuclopenthixol. Experimental studies are presented first, followed by observational and case studies. The review includes 59 studies summarised in Table 14.

Table 14: Summary of studies included in Chapter 2 Section 2

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Arnoldi and Repking (2011)	Case study	USA 73-year-old Caucasian woman taking olanzapine. Pervious heavy smoker.	Stopped smoking, was diagnosed with Parkinson's Disease (PD).	Diagnosis of drug induced parkinsonism made. Olanzapine stopped and PD symptoms reduced	Quality -
Berecz et al (2003)	Prospective cohort study	Spain 76 patients (58 smokers) with chronic psychiatric disorders and on a stable dose of thioridazine.	Plasma concentrations of thioridazine and its metabolites	Compared to non-smokers, smokers had significantly lower levels of thioridazine and its metabolites.	Quality +
Bondolfi et al (2005)	Case studies	Switzerland (1) 51-year-old man on clozapine + fluvoxamine. His blood clozapine level was 230 ng/ml. (2) 33-year-old woman recently started on clozapine 250mg/day and increased to 550 mg/day.	Two weeks after stopping smoking complained of severe sedation and fatigue. Abstained for 16 days.	Clozapine levels checked 8-month later and found to be 667 ng/ml. Blood clozapine concentration of 3005 ng/ml.	Quality +
Brownlowe et al (2008)	Case study	USA 64-year-old woman with schizoaffective disorder, on long-term clozapine. Admitted with uro-sepsis. She was also found to have myocarditis.	Smoked a pack of cigarettes per day up until a few days before admission to hospital when she quit completely.	Her serum clozapine level elevated and this was subsequently stopped.	Quality -
Callaghan et al (1999)	Prospective cohort study	USA 9 healthy smokers and 30 non-smoker) received a single oral dose of olanzapine (5, 10, 15mg)	Pharmacokinetic parameters of olanzapine	Compared to non-smokers, smokers had a significantly higher clearance of olanzapine (p=0.03).	Quality +
Carrillo et al (2003)	Prospective cohort study	Spain 17 (8 smokers) inpatients After 15 days on olanzapine C:D ratio calculated and assessment enzyme activity using debrisoquine and caffeine	Blood olanzapine levels 12-14 hours post dose. Examined the	Mean dose higher in smokers (10mg/day), compared to non-smokers (7.5mg/day). Caffeine indices showed smokers had higher CYP1A2 activity	Quality +

Chetty et al (1994)	Retrospective cohort study	South Africa 31 patients with schizophrenia	Plasma chlorpromazine levels	Clearance was higher in smokers (175 L/hr) than non-smokers (127 L/hr)	Quality +
Derenne & Baldessarini (2005)	Case study	USA Woman with chronic psycho-affective illness maintained on clozapine (450 mg/day) who, following smoking cessation, developed worsening clozapine-related side effects.		Her mean total drug level/dose increased from 2.25 ± 0.54 ng/ml/mg/day whilst smoking to 4.65 ± 0.82 ng/ml/mg/day after she quit.	Quality -
Dettling et al. 2000	Prospective cohort study	Germany 34 people (25 smokers) with schizophrenia using clozapine.	Plasma clozapine concentrations	Smokers had lower dose-corrected clozapine levels than non-smokers (0.6 ± 0.3 ng/ml per mg vs. 1.2 ± 0.7 ng/ml per mg, p=0.001).	Quality +
DeVane and Nemeroff (2001)	Review	Summary of data from clinical trials of quetiapine (an atypically antipsychotic)		Metabolism of this drug is not influenced by smoking.	Quality +
Diaz et al (2005)	Randomised trial	Colombia 47 patients randomised to 3 doses of clozapine	Plasma clozapine levels	Significant variability in plasma levels in heavy vs. light smokers on 100mg/day dose, but not at higher doses.	Quality +
Ereshefsky (1985)	Retrospective cohort study	USA Included 40 psychiatric inpatients (18 smokers) treated with fluphenazine	Dosage, plasma concentration and clearance	Smokers on a higher dose of intramuscular fluphenazine, and had lower plasma levels with oral dosing	Quality +
Ereshesfsky et al. (1991)	Retrospective cohort study	USA 42 patients undergoing routine thiothixene therapeutic drug monitoring.	Daily thiothixene dose, plasma thiothixene levels	No significant difference between smokers and non smokers in plasma levelss (1.33 ± 1.40 vs. 1.24 ± 1.63 ng/ml) or daily dose (32.4 ± 17.5 vs. 25.0 ± 22.9 mg/day).	Quality +
Fric et al. (2008)	Retrospective cohort study	Germany 28 people with depression, 8 of who smoked.	Daily dose and steady-state levels of duloxetine	Smokers, compared to non-smokers had a lower mean plasma duloxetine concentration (24.3 ± 18.8 vs. 67.8 ± 87.5 ng/ml) and higher daily dose (90.5 ± 16.0 vs. 84 ± 25.8 mg).	Quality +
Fukunda (2000)	Retrospective cohort study	Japan 102 inpatients (46 smokers) on haloperidol	Haloperidol level over dose ratio calculated	No difference between smokers and non-smokers	Quality +
Gex-Fabry (2003)	Retrospective cohort study	Switzerland Data collected from 250 people with mental health illness.	Plasma olanzapine concentration	Olanzapine levels were significantly reduced in smokers.	Quality +
Haring (1989)	Retrospective	Austria	Trough blood	Average plasma clozapine	Quality +

	cohort study	148 psychiatric patients receiving clozapine. 81 were smokers.	samples taken for determination of plasma clozapine levels	concentrations in smokers were significantly higher than non-smokers.	
Hasegawa et al. (1993)	Prospective cohort study	USA 59 people with treatment-resistant schizophrenia taking clozapine.	Plasma clozapine concentrations	Clozapine concentrations did not differ between smokers and non-smokers.	Quality +
Haslemo (2006)	Prospective cohort study	Norway 73 patients with schizophrenia (59 smokers). 33 and 40 on long-term clozapine and olanzapine	Drug plasma concentration	Smokers receiving higher doses, but no differences in plasma levels	Quality +
Hossain et al. (1997)	Prospective cohort study	USA Examined PK parameters of alprazolam in 17 healthy adults (8 smokers).	PK parameters	Smoking was associated with a 100% increase in alprazolam clearance (7.5 L/h for smokers vs. 3.77 L/hr for non-smokers, $p<0.05$).	Quality +
Jaanson et al. (2002)	Prospective cohort study	Estonia 52 patients (15 smokers) with schizophrenia receiving zuclopenthixol. The main aim of the study was to determine the impact of the CYP2D6 polymorphism on steady-state zuclopenthixol levels.	Serum concentrations of zuclopenthixol	Overall, smokers had significantly ($p=0.049$) lower mean C/D ratios (0.029 nmol/L) than non-smokers (0.037 nmol/L). In homozygous extensive metabolisers there was no significant difference in C/D ratio (smokers vs. non-smokers (0.029 vs. 0.033 nmol/L, $p=0.36$)	Quality +
Jain et al (2008)	Case studies	USA 47-year-old patient with schizophrenia stabilised on clozapine for 11 years. A 21-year-old smoker admitted with acute psychotic mania. Stabilised on olanzapine.	She quit smoking and complained of extreme fatigue and tiredness.	She had plasma clozapine level of 1083 ng/ml! The dose was subsequently reduced. On a weekend pass become manic again after smoking 4-packs of cigarettes	Quality -
Jann et al (1986)	Prospective cohort study	West Germany 23 smokers and 27 non-smokers	Plasma concentrations and clearance of haloperidol	Smokers were found to have lower plasma concentrations than non-smokers ($p<0.05$)	Quality +
Jin (2010)	Prospective cohort study	USA (multicentre) 156 Patients with schizophrenia (smokers=52) using perphenazine.	Plasma levels of perphenazine and PK variables	Race and smoking status had a significant effect on clearance.	Quality +
John et al. (1980)	Prospective cohort study	UK Examined effects of age, cigarette smoking and oral contraceptives on plasma clomipramine	Plasma clomipramine concentrations	Smokers had lower mean blood levels (29.0 ± 3.0 ng/ml) than non-smokers (60.0 ± 15.3 ng/ml). No difference in levels of the	Quality +

		concentrations.		main clomipramine metabolite between groups.	
Jorgensen et al. (1985)	Prospective cohort study	Denmark 20 patients with schizophrenia receiving zuclopenthixol	serum concentrations of zuclopenthixol	Smoking status had no effect on serum drug concentration.	Quality +
Kondo et al. 1996	Prospective cohort study	Japan Examined pharmacokinetics of zotepine and its interaction with diazepam in 14 healthy men (8 smokers, 6 non-smokers).	PK parameters of zotepine	Smoking status had no effect on any PK parameters.	Quality +
Linnoila et al. (1981)	Prospective cohort study	USA 88 depressed inpatients, 16 of whom smoked.	Steady-state plasma amitriptyline and/or nortriptyline levels	Plasma concentrations of amitriptyline + nortriptyline were significantly ($p<0.05$) lower in smokers (73.4 ± 13.7 ng/ml) vs. non-smokers (107.3 ± 31.5 ng/ml). Nortriptyline alone (smokers: 39.9 ± 18.5 ng/ml; non-smokers: 69.4 ± 18.0; $p<0.05$).	Quality +
Martin et al. (1991)	Retrospective cohort study	USA 45 adults with mental health illness taking carbamazepine.	Clearance of carbamazepine	Smoking status had no significant effect on clearance.	Quality +
Meyer (2001)	Before-After case control study	USA 11 long-term patients with schizophrenia receiving stable clozapine doses for at least 30 days.	Changes in clozapine levels after total smoking ban.	Mean plasma clozapine levels pre-ban were significantly lower than post-ban.	Quality +
Miller et al. (1990)	Prospective cohort study	20 healthy volunteers, 10 of who were smokers received a single dose (20mg) of haloperidol	Plasma concentrations of haloperidol	The elimination half-life was significantly shorter in smokers, compared to non-smokers	Quality +
Norman et al. (1977)	Prospective cohort study	Australia 22 smokers and 31 non-smokers.	Steady state plasma nortriptyline levels	No significant difference was found between the groups (smokers: 191.2 ± 141.3 ng/ml; non-smokers: 169.3 ± 92.4 ng/ml).	Quality +
Norman et al. (1981)	Prospective cohort study	Australia Examined PK parameters of oral desmethyldiazepam in 12 healthy male volunteers, half of who smoked.	PK parameters	Compared to non-smokers, smokers had a shorter elimination half-life (54.7 ± 17.7 vs. 29.8 ± 9.9 hours, $p<0.05$) and lower maximum plasma concentrations (413 ± 106 ng/ml vs. 245 ± 50 ng/ml, $p<0.05$).	Quality +
Ochs et al.	Prospective	Germany	PK parameters	Smoking status had no	Quality +

(1985)	cohort study	Examined PK parameters of IV diazepam, midazolam and lorazepam in 20 healthy adults half of whom smoked.		significant effect on any PK parameters for diazepam and midazolam. A 19% decrease ($p<0.05$) in elimination half-life of lorazepam was seen in smokers (13.3 ± 0.7 hours) compared to non-smokers (16.4 ± 1.2).	
Ochs et al. (1986)	Prospective cohort study	Germany Examined PK parameters of IV desmethyldiazepam in 19 healthy adult volunteers (8 were smokers).	PK parameters	Smoking status had no effect on any PK parameters of IV desmethyldiazepam.	Quality +
Ochs et al. (1987)	Prospective cohort study	Germany Examined PK parameters of triazolam in 24 healthy male volunteers, half of who smoked daily.	PK parameters	Smoking status had no effect on any PK parameters.	Quality +
Otani et al. 1997	Prospective cohort study	Japan Examined PK parameters of triazolam and alprazolam in 10 healthy male volunteers.	PK parameters	Smoking status had no effect on any PK parameters.	Quality +
Ozdemir et al (2001)	Prospective cohort study	Canada 18 patients with schizophrenia treated with clozapine	Plasma clozapine levels	Non-smokers have a significantly higher plasma clozapine level than smokers	Quality +
Palego et al. (2002)	Prospective cohort study	Italy 50 patients (22 smokers) taking clozapine.	Plasma clozapine concentrations	Clozapine levels were lower among smokers compared with non-smokers (57.4 vs. 86.4 ng/ml/mg/day/kg). Difference not statistically significant.	Quality +
Pantuck et al (1982)	Prospective cohort study	USA 17 health men (8 smokers, 9 non-smokers), prescribed 75 mg chlorpromazine	Plasma chlorpromazine levels	Mean peak plasma concentration was 24% lower in smokers	Quality +
Perel et al. (1976)	Retrospective cohort study	USA 26 patients with unipolar affective illness.	Plasma concentration of imipramine	Mean plasma concentration of imipramine was significantly lower ($p<0.05$) in smokers (160 ng/ml) compared to non-smokers (290 ng/ml).	Quality +
Perry et al. (1993)	Retrospective cohort study	24 smoking and 16 non-smoking patients with schizophrenia who were stable on oral doses of between 10 -70 mg/day	Plasma concentrations of haloperidol	At doses below 0.5 mg/kg/day, non-smokers had higher plasma levels. At doses above 0.5 mg/kg/day they did not differ from non-smokers.	Quality +
Perry et al.	Prospective	USA	Steady-state	Mean normalised total	Quality +

1986	cohort study	9 smokers and 15 non-smokers.	plasma nortriptyline concentration and other pharmacokinetic parameters	nortriptyline concentration was significantly lower in smokers (118 ± 33 ng/ml) compared with non-smokers (158 ± 35 ng/ml).	
Pettitt et al. (2009)	Case study	New Zealand Studied changes in serum clozapine concentrations in six mental health inpatients following the implementation of smokefree policy.		At 4-weeks post-cessation the mean increase in serum clozapine was 2.09 times baseline. Five clients required a dosage adjustment.	Quality -
Rickels et al. (1983)	Prospective cohort study	USA 74 outpatients with depression	Plasma amitriptyline levels at 2 and 6 weeks after starting treatment.	No significant correlation with tobacco use was found.	Quality +
Rostami-Hodjegan et al. (2004)	Retrospective cohort study	UK 3782 patients taking clozapine. Smoking was recorded in 53% of males and 44% of females.	Plasma clozapine levels	Mean plasma clozapine concentration was significantly lower in smokers compared with non-smokers (393 vs. 553 ng/ml, p<0.001).	Quality +
Sandson et al. (2007)	Case study	USA Smoker with schizophrenia who was started and stabilised on clozapine (500mg/day) whilst on a smokefree mental health unit. On discharge he started smoking again and experienced a deterioration of his psychiatric symptoms.		The clozapine level on readmission was low. He required 900 mg/day to achieve therapeutic clozapine levels whilst smoking.	Quality -
Seppala et al. 1999	Prospective cohort study	Finland 44 patients with schizophrenia taking clozapine. 34 smokers.	Plasma clozapine concentrations	Smokers had lower mean clozapine concentrations compared with non-smokers (184 ± 97 vs. 298 ± 127 nmol/L per mg/kg, p=0.021).	Quality +
Skogh (1999)	Case study	38-year-old patient with schizophrenia, maintained on a daily dose of 700-725 mg of clozapine. Admitted to hospital unconscious, and developed seizures.		Stopped smoking 14 days earlier. Plasma clozapine not reported, but dose was reduced to 500 mg/day.	Quality -
Skogh (2002)	Retrospective cohort study	Sweden 194 Swedish patients (69 smokers) taking oral olanzapine	Plasma olanzapine concentration, Concentration: Dose ratio	Smokers had lower concentrations and lower prescribed dose. C/D ratio was also lower in smokers.	Quality +
Spigset et al.	Prospective	Sweden	PK parameters	Smokers had significantly	Quality +

(1995)	cohort study	Examined PK parameters of a single dose of oral fluvoxamine in 24 healthy adult volunteers (12 were smokers).		(p=0.012) lower maximum plasma drug concentration (39.1 ± 17.3 nmol/L) compared with non-smokers (57.7 ± 21.5 nmol/L).	
Stimmel and Falloon (1983)	Case study	25-year-old man with schizophrenia treated with chlorpromazine.		Smoking cessation was accompanied by an increase in medication side effects, and increased chlorpromazine levels.	Quality -
van der Weide et al. (2003)	Retrospective cohort study	Netherlands 80 people with schizophrenia on long-term clozapine.	Serum clozapine concentration and dose	The C/D ratio was on average 2.5 times lower in smokers than non-smokers, and smokers required a significantly ($p<0.01$) higher maintenance dose (382 mg/day) than non-smokers (197 mg/day).	Quality +
Wahawisan et al (2011)	Case study	46-year-old man admitted to intensive care with symptoms of methadone toxicity	Had been on stable methadone dose for 4 months	Had reduced cigarette consumption from pack to half a pack/day over the past month.	Quality -
Wenzel-Seifert et al (2011)	Retrospective cohort study	Germany Analysed data from therapeutic monitoring programmes (N's not reported)	Routine drug concentrations, demographic data, weight, height and smoking status	Smoking increased clearance of clozapine in men and women by 49% and 63%, increased olanzapine clearance by 83% and 53%.	Quality +
Wetzel et al (1998)	Prospective cohort study	USA 30 patients on clozapine and later added fluvoxamine or paroxetine (SSRIs)	Plasma clozapine levels	32% lower serum levels in smokers.	Quality +
Wu et al (2008)	Prospective cohort study	Taiwan 27 patients with schizophrenia; 9 non-smokers, 9 light smokers (<5 cpd), 9 heavy smokers).	Levels of olanzapine after 10mg oral dose.	Maximum plasma concentration was lower in heavy smokers compared to non-smokers ($p<0.001$).	Quality +
Ziegler & Biggs 1977	Prospective cohort study	USA Patients with depression treated with amitriptyline (n=35) or nortriptyline (n=30).	Serum drug levels	No statistically significant difference in mean drug levels between smokers and non-smokers in amitriptyline users (68.1 vs. 77.9 ng/ml) or nortriptyline users (95.7 vs. 86.3 ng/ml).	Quality +
Zullino et al (2002)	Case study	Switzerland Case 1: 37-year-old smoker with schizophrenia smoker also smoking cannabis given	1 month post quit both tobacco and cannabis agitated and confused	Blood clozapine (3.5 months after quitting) 1328 ng/ml. Dose reduced and symptoms resolved	Quality -

		clozapine 700mg/day. Case 2: 25-year-old smoker with bipolar disorder treated with olanzapine 30mg/day.	Reduced smoking from 40 to 10 cpd, Parkinson's 4 days later.	Olanzapine dose was reduced to 20mg/day and symptoms disappeared.	

Benzodiazepines

Hossain et al. (1997, prospective cohort [+]) examined PK parameters of alprazolam in 17 healthy adults (8 smokers). Smoking was associated with a 100% increase in alprazolam clearance (7.5 L/h for smokers vs. 3.77 L/hr for non-smokers, $p<0.05$).

Norman et al. (1981, prospective cohort [+]) examined PK parameters of oral desmethyldiazepam (the main metabolite of clorazepate) in 12 healthy male volunteers, half of who smoked. Compared to non-smokers, smokers had a shorter elimination half-life (54.7 ± 17.7 vs. 29.8 ± 9.9 hours, $p<0.05$) and lower maximum plasma concentrations (413 ± 106 ng/ml vs. 245 ± 50 ng/ml, $p<0.05$). Clinically, the subjective sedative effect was less in smokers than non-smokers.

Ochs et al. (1985, prospective cohort [+]) examined PK parameters of diazepam, midazolam and lorazepam, given intravenously, in 20 healthy adults half of whom smoked. Smoking status had no significant effect on any PK parameters for diazepam and midazolam. However for lorazepam a 19% decrease ($p<0.05$) in elimination half-life was seen in smokers (13.3 ± 0.7 hours) compared to non-smokers (16.4 ± 1.2).

Ochs et al. (1986, prospective cohort [+]) examined PK parameters of intravenous desmethyldiazepam (the main metabolite of clorazepate) in 19 healthy adult volunteers (8 were smokers). Smoking status had no effect on any PK parameters of intravenous desmethyldiazepam.

Ochs et al. (1987, prospective cohort [+]) examined PK parameters of triazolam in 24 healthy male volunteers, half of who smoked daily. Smoking status had no effect on any PK parameters.

Otani et al. (1997, prospective cohort [+]) examined PK parameters of triazolam and alprazolam in 10 healthy male volunteers. Smoking status had no effect on any PK parameters.

Carbamazepine

Carbamazepine is an anticonvulsant medication, but is indicated in the treatment of a number of other illnesses including prophylaxis of bipolar disorder unresponsive to lithium and acute alcohol withdrawal (BNF). Martin et al. (1991, retrospective cohort, [+]) measured clearance of carbamazepine in 45 adults with mental health illness. Smoking status had no significant effect on clearance.

Chlorpromazine

Chetty et al. (1994, retrospective cohort [+]) analysed plasma chlorpromazine levels among 31 patients with schizophrenia. Clearance was higher among smokers (175 L/hr) compared to non-smokers (127 L/hr).

Pantuck et al (1982, prospective cohort, [+]) report on a cohort of 17 healthy participants (8 smokers and 9 non-smokers) prescribed 75mg of chlorpromazine. Mean peak plasma concentration was 24% lower in smokers (5.4 +/- 1.9 ng/ml) than non-smokers (7.1 +/- 0.9 ng/ml) although this difference was not significant.

Stimmel and Falloon (1983, case study [-]) report a case of a 25-year-old man with schizophrenia treated with chlorpromazine. Smoking cessation was accompanied by an increase in medication side effects, and the patient was found to have increased chlorpromazine levels.

Clozapine

Dettling et al. (2000, prospective cohort [+]) measured plasma clozapine concentrations in 34 people with schizophrenia. Smokers (n=25) had significantly lower dose-corrected clozapine concentrations than non-smokers (0.6 ± 0.3 ng/ml per mg vs. 1.2 ± 0.7 ng/ml per mg, p=0.001).

Diaz et al (2005, randomised non-controlled trial, [+]) randomized 47 patients to three daily doses of clozapine (100mg, 300mg and 600mg). For heavy smokers (30 or more cigarettes per day), compared to non-heavy smokers, there was significant variability in plasma concentrations (p=0.03) when receiving the 100mg/day dose. At higher doses there was no significant difference.

Haring et al. (1989 retrospective cohort [+]) examined trough clozapine levels 148 psychiatric patients, 81 of whom were smokers. Average plasma clozapine concentrations in smokers were 82% that of non-smokers, p<0.022.

Hasegawa et al. (1993, prospective cohort [+]) measured plasma clozapine concentrations in 59 people with treatment-resistant schizophrenia. Clozapine concentrations did not differ between smokers and non-smokers.

Haslemo et al (2006, prospective cohort [+]) assessed plasma concentrations of clozapine (N=33) or olanzapine (N=40) in patients with schizophrenia using the medications for at least 18 months. Fifty-nine were smokers, 14 were non-smokers. Smokers were receiving higher doses of medication, but not significantly higher. The plasma concentration of clozapine was higher in non-smokers (2,063 nmol/l) compared with smokers (1,370 nmol/l), although the difference did not reach statistical significance (p=0.06). C/D ratio was significantly greater in non-smokers (6.0) compared with smokers (2.8; p=0.004).

Meyer (2001, case control study [+]) studied clozapine levels in 11 patients with schizophrenia before and after a complete smoking ban in a psychiatric hospital (Meyer 2001). Mean plasma clozapine concentrations pre ban was 550+/-160 ng/ml, rising to 993+/-713 ng/ml post-ban, an 80% increase (p<0.034). One patient who had plasma concentration of 3066 ng/ml post ban (261% increase from baseline) suffered aspiration pneumonia.

Ozdemir et al (2001, prospective cohort [+]) monitored 18 patients with schizophrenia treated with clozapine. Non-smokers have a significantly higher plasma clozapine level than smokers (3.2 fold difference, $p<0.05$).

Palego et al. (2002, prospective cohort [+]) measured plasma clozapine concentrations in 50 patients (22 smokers). Clozapine levels were lower among smokers compared with non-smokers (57.4 vs. 86.4 ng/ml/mg/day/kg) although the difference was not statistically significant.

Rostami-Hodjegan et al. (2004, retrospective cohort [+]) measure plasma clozapine levels in blood samples from 3782 patients. Smoking was recorded in 53% of males and 44% of females. Mean plasma clozapine concentration was significantly lower in smokers compared with non-smokers (393 vs. 553 ng/ml, $p<0.001$).

Seppala et al. (1999, prospective cohort [+]) measured plasma clozapine concentrations in 44 patients with schizophrenia. Smokers (n=34) had significantly lower mean clozapine concentrations compared with non-smokers (184 ± 97 vs. 298 ± 127 nmol/L per mg/kg, $p=0.021$).

van der Weide et al. (2003, retrospective cohort, [+]) measured serum clozapine concentration and dose in 80 people with schizophrenia who were on long-term clozapine. The C/D ratio was on average 2.5 times lower in smokers than non-smokers, and smokers required a significantly ($p<0.01$) higher maintenance dose (382 mg/day) than non-smokers (197 mg/day).

Wenzel-Seifert et al (2011, retrospective cohort [+]) report on drug concentrations of clozapine and olanzapine collected routinely as part of a therapeutic drug monitoring programme and the relationship with sex and smoking status. Smoking increased clearance of clozapine in men and women by 49% and 63%. Smoking increases olanzapine clearance by 83% and 53% in men and women respectively. The authors recommend that the dose of clozapine and olanzapine needs to be reduced by approximately 35% when people stop smoking. A reduction in cigarette consumption does not require dosage adjustment.

Wetzel et al. (1998, prospective cohort [+]) treated 30 patients with clozapine and later added fluvoxamine or paroxetine (SSRIs) to investigate the effects on serum clozapine levels. When only on clozapine, differences in serum levels were observed between smokers and non-smokers, with 32% lower serum levels in smokers.

Eight case studies document the risk of increase in clozapine levels in patients who stop smoking.

Bondolfi et al (2005, case study [-]) presented two cases. A 51-year-old man on clozapine 400 mg/day plus fluvoxamine 50 mg/day had blood clozapine level 230 ng/ml prior to stopping smoking. Two weeks after stopping smoking he complained of severe sedation and fatigue. Clozapine levels 8-month later were 667 ng/ml. A 33 year old woman started on clozapine 250mg/day. After 2 days of treatment she was transferred from the psychiatric unit to a surgical ward where she was unable to smoke for 16 days. Her clozapine dose was increased to 450 mg/day. She was transferred back to the psychiatric unit where her dose was further increased to 550 mg/day. Her blood clozapine concentration was 3005 ng/ml.

Brownlowe et al (2008, case study [-]) described a case of a 64-year-old woman with schizoaffective disorder, on long-term clozapine. She was admitted with uro-sepsis and

treated with ciprofloxacin. Whilst in hospital she was also diagnosed with myocarditis and an elevated level of clozapine. Ciprofloxacin is known to interact with clozapine, and the authors conclude that smoking cessation contributed to the elevation in serum clozapine.

Derenne & Baldessarini (2005, case study, [-]) report a woman with chronic psycho-affective illness maintained on clozapine (450 mg/day) who, following smoking cessation, developed worsening clozapine-related side effects. Her mean total drug level/dose increased from 2.25 ± 0.54 ng/ml/mg/day whilst smoking to 4.65 ± 0.82 ng/ml/mg/day after she quit.

Jain et al (2008, case study [-]) reported on a 47-year-old woman with schizophrenia stabilised on clozapine (750mg day) for 11 years. One month after stopping smoking, she complained of hypersalivation, extreme fatigue and daytime sleepiness. She was found to have a plasma clozapine level of 1083 ng/ml. Her clozapine dose was subsequently reduced. The paper also reports on a 21-year-old male smoker admitted to hospital with acute psychotic mania. He was stabilised on olanzapine but during a weekend at home he become manic again, which was thought to be due to the fact that he had smoked heavily, thus reducing the olanzapine cover.

Pettitt et al. (2009, case study, [-]) studied changes in serum clozapine concentrations in six mental health inpatients following the implementation of smokefree policy. At 4-weeks post-cessation the mean increase in serum clozapine was 2.09 times baseline. Five clients required a dosage adjustment.

Sandson et al. (2007, case study, [-]) report on a smoker with schizophrenia who was started and stabilised on clozapine (500mg/day) whilst on a smokefree mental health unit. On discharge he started smoking again and experienced a deterioration of his psychiatric symptoms. The clozapine level on readmission was low. He required 900 mg/day to achieve therapeutic clozapine levels whilst smoking.

Skogh (1999, case study [-]) reports on a 38 year old man with a history of schizophrenia, maintained on a high daily dose of 700-725 mg of clozapine. His trough plasma concentration on this dose was only 197 ng/ml. He was admitted to hospital in an unconscious state, and developed seizures. After he was stabilised he reported stopping smoking 14 days prior to admission. Plasma clozapine concentration was not reported, but he had a dose reduction in clozapine to 500 mg/day. Six months later his trough plasma concentration was 334 ng/ml and so his dose was further reduced to 425mg/day, which gave a trough level of 187 ng/ml.

Zullino et al (2002, case study [-]) reports on a 37-year-old man with schizophrenia treated with clozapine (700mg/day), who had smoked tobacco since adolescence. He was also a daily cannabis smoker. One month after stopping smoking both tobacco and cannabis he became increasingly agitated and confused over a 2 month period. His blood clozapine level (3.5 months after quitting) was 1328 ng/ml. His clozapine dose was reduced and within a week his adverse symptoms disappeared

Fluphenazine

Ereshefsky et al (1985, retrospective cohort [+]) studied 40 psychiatric inpatients treated with fluphenazine (18 oral, 22 intramuscular). Smokers were on a significantly higher dose of intramuscular (IM) fluphenazine than non-smokers (48.28 mg/day vs. 28.34 mg/day, $p<0.02$). There was no difference in oral dosage between smokers and non-smokers, but plasma concentration was significantly lower in smokers vs. non-smokers in this group (0.89 ng/ml vs. 1.83 ng/ml, $p<0.05$). Clearance of fluphenazine was significantly greater in smokers taking

oral fluphenazine (16.72 vs. 9.99 l/min, p<0.005) and IM fluphenazine (7.37 vs. 3.16 l/min, p<0.005)

Haloperidol

Fukuda (2000, retrospective cohort [+]) examined haloperidol level over dose ratio in a cohort of 102 long-term psychiatric patients (46 smokers and 56 non-smokers). There was no significant difference between smokers and non-smokers (57.2+/-21.1 ng.ml and 60.9+/-29.0 mg/ml, respectively).

Jann et al. (1986, prospective cohort [+]) assessed plasma concentrations and clearance of haloperidol in 23 smokers and 27 non-smokers. Smokers were found to have lower plasma concentrations than non-smokers (p<0.05) and marginally greater clearance (p=0.052).

Miller et al. (1990, prospective cohort [+]) studied gave a single dose (20mg) of haloperidol to 20 people, 10 of who were smokers. The elimination half-life was significantly shorter in smokers, compared to non-smokers.

Perry et al. (1993, retrospective cohort [+]) compared plasma concentrations of haloperidol in 24 smoking and 16 non-smoking patients with schizophrenia who were stable on oral doses of between 10 and 70 mg/day. At doses below 0.5 mg/kg/day, non-smokers had higher plasma concentrations. However at doses above 0.5 mg/kg/day there was no difference between smokers and non-smokers.

Methadone

Wahawisan et al (2011, case study, [-]) reported on a 46-year-old man admitted to intensive care with symptoms of methadone toxicity. He had smoked a pack of cigarettes per day for 33 years, and had been commenced on methadone treatment 4-months prior to admission for back pain. Over the previous month he had halved his cigarette consumption. The authors recommend that patients who are maintained on methadone and stop smoking should be monitored for signs of methadone toxicity.

Olanzapine

Callaghan et al. (1999, prospective cohort [+]) report on a data held on file by Eli Lilly and Company from a single dose olanzapine pharmacokinetic study that recruited 39 healthy volunteers (19 smokers and 30 non-smokers). Compared to non-smokers, smokers had a significantly higher clearance of olanzapine (p=0.03).

Carrillo et al. (2003, prospective cohort [+]) examined the concentration to dose ratio in 17 inpatients (8 were smokers) after 15 days on the drug. Smokers were on 10mg/day, and non-smokers on 7.5mg/day (p<0.01). Caffeine indices in non-smokers and smokers were 17+/-8 and 101+/-44 (mean diff = -84, CI -115 - -52, p<0.0001), showing that smokers had much higher CYP1A2 activity. CYP1A2 activity in smokers of <5 cigarettes per day was similar to non-smokers. There was a five-fold decrease in plasma concentration in smokers of 5 or more cigarettes per day compared to non-smokers (concentration: dose [C/D] ratio 7.9+/-2.6 vs. 1.56+/-1.1 ng/ml, p<0.001).

Gex-Fabry et al (2003, retrospective cohort [+]) assessed plasma concentrations in 250 patients of whom 70 were smokers. Smokers had a significantly reduced (12%) plasma olanzapine concentration compared to non-smokers (expected value =0.88; CI: 0.77-1.00; p=0.046).

Haslemo et al. (2006, prospective cohort [+]) in the study reported above showed that the plasma concentration of olanzapine was greater in non-smokers (210 nmol/l) compared with smokers (126 nmol/l; p=0.004), although the difference did not reach statistical significance (p=0.06). The C/D ratio was significantly higher in non-smokers (6.1) compared with smokers (12.8; p=0.001).

Skogh (2002, retrospective cohort [+]) analysed data from 194 patients taking oral olanzapine. Smokers (n=69) had a significantly lower plasma olanzapine concentrations (60 nmol/l) than non smokers (n=73) (92 nmol/l, p<0.001). They also had a significantly lower prescribed dose (10mg vs.12.5mg p<0.05). C/D ratio was substantially lower among smokers (4.0 vs. 9.2 nmol/l/mg, p<0.001)

Wu et al. (2008, prospective cohort [+]) studied the pharmacokinetics of a 10 mg oral dose of olanzapine in 27 male Taiwanese inpatients with schizophrenia. Nine were non-smokers, 9 light smokers (<5 cigarettes per day) and 9 heavy smokers. Maximum plasma concentration was significantly lower in heavy smokers compared to non-smokers (p<0.001). Adjusting for body weight heavy smokers had a significantly lower plasma concentration that non-smokers (p<0.001) and light smokers (p<0.05).

A case report documents an increase in olanzapine levels after stopping smoking (see also Jain et al. 2008 included in clozapine case studies).

We found two case reports of olanzapine induced Parkinson's disease following smoking cessation (**Arnoldi and Repking 2011, case study [-])**, and smoking reduction **(Zullion et al 2002, case study [-])** but no plasma levels were reported.

Perphenazine

Jin et al (2010, prospective cohort [+]) examined the interaction between smoking and perphenazine in 156 patients with schizophrenia. 104 patients were current smokers. Both race and smoking status had a significant effect on clearance of perphenazine. The highest rate of clearance was observed in smoking African Americans (AA) (833.90 L/h) compared with a rate of 444.23 L/h in non-Smoking non-AA (p<0.001). Similar differences were observed for mean daily drug dose (mg) for smokers versus non-smokers (25.33 vs. 21.62; p<0.05).

Quetiapine

DeVane and Nemeroff (2001, Review, [+]) report that data from clinical trials of quetiapine (an atypically antipsychotic) show that smoking does not influence the metabolism of this drug. Values of apparent oral clearance in 30 non-smoking patients with psychosis was not statistically difference different to clearance in 94 patients who smoked.

Selective Serotonin Reuptake Inhibitors

Fric et al. (2008, retrospective cohort [+]) measured steady-state levels of duloxetine in 28 people with depression, 8 of who smoked. The mean plasma duloxetine concentration was significantly lower in smokers (24.3 ± 18.8 ng/ml), compared with non-smokers (67.8 ± 87.5 ng/ml). Smokers, compared to non smokers were taking a higher daily dose (90.5 ± 16 vs. 84 ± 25.8 mg).

Spigset et al. (1995, prospective cohort [+]) examined PK parameters of a single dose of oral fluvoxamine in 24 healthy adult volunteers (12 were smokers). Smokers had significantly ($p=0.012$) lower maximum plasma drug concentration (39.1 ± 17.3 nmol/L) compared with non-smokers (57.7 ± 21.5 nmol/L). The elimination half-life did not differ between groups.

Thioridazine

Berecz et al (2003, prospective cohort [+]) examined the difference in plasma concentrations of thioridazine and its metabolites in a cohort of 76 patients (58 smokers and 18 non smokers) on a stable dose of thioridazine. Compared to non-smokers, smokers had significantly lower levels of thioridazine (4.0 vs. 7.4, $p<0.001$) and its metabolites.

Thiothixene

Ereshesfsky et al. (1991, retrospective cohort, [+]) measured plasma thiothixene levels in 42 patients undergoing routine therapeutic drug monitoring. Overall, there was no significant difference between levels in smokers (1.33 ± 1.40 ng/ml) versus non-smokers (1.24 ± 1.63 ng/ml).

Tricyclic antidepressants

John et al. (1980, prospective cohort, [+]) examined the effects of age, cigarette smoking and oral contraceptives on plasma clomipramine concentrations. Smokers had lower mean blood clomipramine levels (29.0 ± 3.0 ng/ml) than non-smokers (60.0 ± 15.3 ng/ml). However, there was no difference in levels of the main clomipramine metabolite between groups. People who smoked 15 or more cigarettes per day were noted to tolerate the daily dose (75mg) better than non-smokers.

Linnoila et al. (1981, prospective cohort, [+]) examined steady-state plasma amitriptyline and/or nortriptyline levels in 88 depressed inpatients (16 smokers). Plasma concentrations of amitriptyline + nortriptyline were significantly ($p<0.05$) lower in smokers (73.4 ± 13.7 ng/ml) compared to non-smokers (107.3 ± 31.5 ng/ml). The same pattern was also observed for nortriptyline alone (smokers: 39.9 ± 18.5 ng/ml; non-smokers: 69.4 ± 18.0; $p<0.05$).

Norman et al. (1977, prospective cohort, [+]) examined steady state plasma nortriptyline levels in 22 smokers and 31 non-smokers. No significant difference was found between the groups (smokers: 191.2 ± 141.3 ng/ml; non-smokers: 169.3 ± 92.4 ng/ml).

Perel et al. (1976, retrospective cohort, [+]) assessed plasma concentration of imipramine in 26 patients with unipolar affective illness. Mean plasma concentration of imipramine was significantly lower ($p<0.05$) in smokers (160 ng/ml) compared to non-smokers (290 ng/ml).

Perry et al. (1986, prospective cohort, [+]) determined steady-state plasma nortriptyline concentration and other pharmacokinetic parameters in 9 smokers and 15 non-smokers. Mean normalised total nortriptyline concentration was significantly lower in smokers (118 ± 33 ng/ml) compared with non-smokers (158 ± 35 ng/ml).

Rickels et al. (1983, prospective cohort, [+]) measured plasma amitriptyline levels in 74 outpatients with depression at 2 and 6 weeks after starting treatment. No significant correlation with tobacco use was found.

Ziegler & Biggs (1977, prospective cohort, [+]) measured serum drug levels in patients with depression treated with amitriptyline (n=35) or nortriptyline (n=30). There was no statistically significant difference in mean drug levels between smokers and non-smokers in amitriptyline users (68.1 vs. 77.9 ng/ml) or nortriptyline users (95.7 vs. 86.3 ng/ml).

Zotepine

Kondo et al. (1996, prospective cohort [+]) examined pharmacokinetics of zotepine and its interaction with diazepam in 14 healthy men (8 smokers, 6 non-smokers). Smoking status had no effect on any PK parameters.

Zuclopenthixol

Jaanson et al. (2002, prospective cohort [+]) measured serum concentrations of zuclopenthixol in 52 patients (15 smokers) with schizophrenia. The main aim of the study was to determine the impact of the CYP2D6 polymorphism on steady-state zuclopenthixol levels. Most patients (n=35) were homozygous extensive metabolisers, 13 were heterozygous and 4 were poor metabolisers. Overall, smokers had significantly (p=0.049) lower mean C/D ratios (0.029 nmol/L) than non-smokers (0.037 nmol/L). However, 87% of smokers were homozygous extensive metabolisers, which confound the results. When considering only the group of homozygous extensive metabolisers there was no significant difference in C/D ratio between smokers and non-smokers (0.029 vs. 0.033 nmol/L, p=0.36).

Jorgensen et al. (1985, prospective cohort [+]) measured serum concentrations of zuclopenthixol in 20 patients with schizophrenia. Smoking status had no effect on serum drug concentration.

Reviews

We did not find any systematic reviews, but identified seven reviews discussing relevant literature (de Leon 2004; Montalto & Farid 1997; Zevin and Benowitz 1999; Desai et al 2001; Kroon 2007; Schaffer 2009; and Murray 2010). All these reviews identify medications sensitive to smoking, and recommend monitoring of their systemic levels if there is a change in smoking status.

INTERPRETATION

Most of the reviewed medications seem to be metabolised faster by smokers than by non-smokers. The corollary of this finding is that in stable patients on well-tolerated medication

doses, stopping smoking is likely to increase systemic levels of these drugs and needs to be accompanied by dose adjustments.

The effect seems particularly striking with clozapine and olanzapine. Haslemo et al (2006) make an important point that because smoking prevalence is high in psychiatric patients, the dosing recommendations were established in smoking populations. Non-smokers thus may be at risk of over-medication and AE if put on the standard dose. The authors suggest that in non-smokers, the standard starting dose should be reduced by 50%. de Leon (2004, general review) estimates that a correction factor of 1.5 should be applied for estimating changes in blood levels of clozapine and olanzapine. This means, for example, if a patient on taking clozapine stops smoking their plasma clozapine levels could increase by a factor of 1.5 within 2-4 weeks. However, this is only an approximation.

Regarding dose response to smoking levels, smoking above 4 cigarettes per day seems sufficient to induce CYP1A2. In regular smokers, self-reported cigarettes per day provide little further information.

We found no data on whether NRT mitigates the effects of stopping smoking on increasing systemic levels of these medications.

SECTION 3: EFFECTS OF SMOKING CESSATION INTERVENTIONS ON THE USE OF OTHER SUBSTANCES

The question of whether people undergoing drug and alcohol treatments should be encouraged to stop smoking at the same time has no generally accepted answer at the moment. There are concerns that removing one source of gratification may make the others more precious, or that self-control is a limited resource and that refraining from one desired activity may undermine self-control in other areas (Richter et al. 2002, Baumeister and Tierney, 2011). On the other hand, some drug and alcohol advisors emphasise the importance of a fresh start free of all addictive substances and many tobacco control specialists promote smoking cessation as a priority in any setting.

Below we review literature bearing on the question of whether stopping smoking during drug and alcohol treatment enhances or undermines drug and alcohol sobriety. We identified 20 studies relevant for this topic. These are summarised in Table 15.

Table 15: Summary of studies included in Chapter 2 Section 3

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Brown et al (2001)	Randomised controlled trial	191 adolescent smokers hospitalised with substance abuse given motivational interviewing (N=116) or brief advice (N=75) to stop smoking	Participants were followed up for 1 year	Smoking cessation outcomes were not reported but the context suggests that the intervention had no effect. It had no effect on substance use either.	Quality +
Burling et al (2001)	Randomised controlled trial	USA 150 smokers at a veterans residential rehabilitation programme randomised to usual care (UC), multicomponent smoking treatment (MST) or MST + "generalised training" for both cessation and relapse prevention skills to drug and alcohol use (MST + G).	Smoking status and breath alcohol and urine tests measured at 1, 3, 6 and 12 months.	Continuous drug and alcohol abstinence rate that was significantly higher in the MST vs. MST+G condition (40% versus 20%; p<0.05), but neither condition differed from UC (33%). Smoking abstinence rates were higher in the MST and MST + G compared to UC (12% vs. 10% vs. 0%; p=<0.05).	Quality +
Campbell et al (1995)	Prospective cohort study	66 smokers undergoing smoking cessation treatment at an outpatient and residential drug treatment centre. Half were heroin addicts.	Smoking status at end of treatment (16 weeks) and urges to use drugs of abuse between quit day and day 4.	19/66 reported significantly less urges for drug use (p=0.045), and 9/66 reported increased urges (0=0.02). 7 clients abstinent at end of treatment, and 3 reported drug use in the past week.	Quality +
Cooney et al (2003)	Randomised cross over	USA 40 alcoholics assessed at	Self-reported urges to smoke and drink	Alcohol cue exposure led to increase in urge to	Quality ++

		baseline and had cue exposure to alcohol after 34 hours of not smoking and cue exposure after smoking.		drink that was similar when patients smoked as normal or abstained.	
Cooney et al (2007)	Randomised controlled trial	USA 118 alcohol dependent smokers received a brief or intensive smoking cessation counselling	Smoking abstinence and proportion of days of heavy drinking (PDH) in 30 days prior to 6-month follow-up.	Neither smoking nor alcohol abstinence at 6 months was significantly different between brief and intensive interventions.	Quality +
Cooney et al (2009)	Randomised controlled trial	USA 96 outpatient smokers with a diagnosis of alcohol dependence given 21mg patch + 2mg gum or placebo gum.	Smoking abstinence (CO validated) and validated abstinence from alcohol.	Patch and active gum users more likely abstinent from tobacco and alcohol at 12 months, but only tobacco significant.	Quality +
Dunn et al (2009)	Prospective cohort study	USA 28 smokers enrolled in opioid maintenance treatment given 2-weeks stop-smoking treatment	Daily urine and breath sampling for illicit drug use plus another sampling 30 days after the target quit day	12 abstained, 16 did not. Abstainers and non-abstainers had 99% and 96% samples negative for all illicit drugs.	Quality +
Grant et al (2007)	Randomised controlled trial	USA 58 people undergoing treatment for substance use disorder received nicotine patch + 300mg bupropion/day (n=30) or nicotine patch + placebo bupropion (n=28) and behavioural support.	Smoking status (7-day point prevalence) and alcohol use (no use in last 30 days) were measured at 6-month follow-up	Smoking cessation rates for bupropion and placebo groups were 17% vs. 29% (p=0.35). Rates of abstinence from alcohol use were greater in quitters (13/13) than continued smokers (17/27), p=0.016.	Quality +
Haug et al (2004)	Randomised controlled trial	63 pregnant opioid dependent smokers given motivational therapy (n=30) or usual care (n=33).	Smoking abstinence and test for illicit drug use at 10-weeks	No difference in smoking abstinence rates or illicit drug use	Quality +
Joseph (1993a)	Prospective cohort study	USA 319 patients from Joseph et al (1990) contacted by phone 1-year after discharge. Split into pre and post smoking ban groups.	Improvement in chemical dependency and smoking status	Self-reported abstinence for smoking was higher in the post-ban group than the pre-ban group.	Quality +
Joseph et al (1990)	Prospective cohort study	USA 445 inpatients in a substance abuse programme pre smoking ban and 457 post smoking ban	Surveys on admission and discharge.	Post-ban a greater proportion of smokers abstained for at least a week, reported not smoking regularly and planned to quit smoking.	Quality +
Joseph et al (1993b)	Retrospective cohort study	USA 314 drug and alcohol patients hospitalised before and after unit moved to new premises	154 patients hospitalised post-smoking ban compared with 160 hospitalised pre-	No difference in drug or alcohol use recovery, but when non-responders included as treatment failures, recovery in	Quality +

		where smoking was not permitted in-doors.	smoking ban	cocaine users was lower in the post-ban group	
Joseph et al (2004)	Randomised controlled trial	USA 499 smokers in treatment for alcohol dependence given concurrent (during treatment) or delayed (6 months later) stop-smoking intervention	Alcohol use and abstinence from tobacco (CO validated)	No effect on smoking or alcohol use	Quality +
Kalman et al (2001)	Randomised controlled trial	USA 36 male smokers from an inpatient veteran substance abuse treatment programme randomised to smoking cessation 2 weeks (concurrent treatment) or 6 weeks (delayed treatment) after admission.	Number of drinks per day and percent days of alcohol use were recorded for the 90 days previous to admission and the 20-week period after admission.	No significant difference was in smoking quit rates between groups ($p=0.74$). Number if people with alcohol relapse in the delayed ($n=6$) vs. concurrent ($n=3$) groups ($p<0.07$).	Quality +
Okoli et al (2010)	Review (not systematic)	8 studies of stopping smoking in patients on methadone maintenance, five assessed drug use outcomes		Concluded that smoking cessation treatment does not worsen substance abuse.	Quality +
Prochaska et al (2004)	Systematic Review	Included 19 studies that investigated smoking cessation interventions in patients in substance misuse treatment or recovery.	Smoking cessation and substance use outcomes at the end of treatment, long-term follow-up and substance use outcomes.	Smoking cessation interventions increased abstinence rates at the end of treatment and no effect on other substance use at the end of treatment	Quality +
Reid et al. (2008)	Randomised controlled trial	225 smokers in drug and alcohol maintenance and treatment programmes given stop-smoking treatment or usual care	Smoking cessation at 26 weeks. Retention in substance abuse treatment, abstinence from and craving for primary substance of abuse	Quit rates were 0% in the control group and about 10% in SC. No difference in retention in substance treatment, abstinence or craving for primary substance	Quality +
Richter et al (2005)	Prospective cohort study	28 smokers from methadone clinic treated with bupropion, nicotine gum and motivational interviewing	Smoking abstinence at 6-months, illicit drug use.	14% achieved 6-month smoking abstinence. No change in illicit drug use.	Quality –
Shoptaw et al (1996)	Prospective cohort study	17 smokers on methadone maintenance, 4-weeks contingency management (CM) for smoking cessation	Thrice weekly breath test for CO and urine tests for illicit drug use.	None managed to stop smoking and 16/17 used illicit opiates and 10/17 used cocaine at least once during the study.	Quality –
Shoptaw et al	Randomised controlled trial	175 smokers on methadone maintenance received 12 weeks patch	Thrice weekly breath test for CO and urine tests for illicit drug	Smoking abstinence was a significant predictor of opiate abstinence	Quality +

(2002)		only, relapse prevention (RPI) + patch, CM + patch + RPI or CM + patch.	use.	(p=0.0002) and cocaine abstinence (p<0.0001).	

Brown et al (2001, RCT [+]) randomised 191 adolescent smokers hospitalised with substance abuse to motivational interviewing (MI, N=116) or brief advice (BA, N=75) for smoking cessation. Participants were followed up for 1 year. Smoking cessation outcomes were not reported but the context suggests that the intervention had no effect. It had no effect on substance use either.

Burling et al (2001, RCT [+]) randomised 150 smokers at a veterans residential rehabilitation programme to receive usual care (UC), multicomponent smoking treatment (MST) or MST + "generalised training" for both cessation and relapse prevention skills to drug and alcohol use (MST + G). Breath alcohol and urine tests were taken at 1, 3, 6 and 12 months. The MST condition had a continuous drug and alcohol abstinence rate that was significantly higher than the MST+G condition (40% versus 20% at 12 month FU; p<0.05), neither condition differed from UC. Smoking abstinence rates were higher in the MST and MST + G compared to UC condition (12% vs. 10% vs. 0%; p=<0.05).

Campbell et al (1995, prospective cohort, [+]) report on urges to use drugs of abuse in 66 clients receiving smoking cessation treatment (16 weeks duration). Urge to use drugs of abuse were measured at quit date (baseline) and day 4. Most participants (19/66) reported less urges to use drugs on day 4 than at baseline (p=0.045). However 9/66 reported a significant increase in urges (p=0.02). Urges by smoking status are not reported.

Cooney et al (2003, randomised cross over trial [++]) studied 40 alcohol dependent smokers who took part in three conditions in which they rated their urges to smoke and urges to drink alcohol: (1) baseline (2) cue exposure to alcohol after 34 hours of smoking deprivation and (3) cue exposure after normal smoking. Alcohol cue exposure was associated with an increase in urge to drink that was similar when patients smoked as normal or abstained.

Cooney et al (2007, RCT [+]) randomised 118 alcohol dependent smokers to a brief smoking cessation counselling session (n=63) or an intensive intervention (n=55) including 8-weeks of nicotine patches. There was no difference between the groups in either smoking abstinence at 6 months (1/63 vs. 4/55) or in abstinence from alcohol (30/63 vs. 27/55).

Cooney et al (2009, RCT [+]) randomised 96 outpatient alcoholics to 21mg patch + 2mg gum (n=45) or 21mg patch + placebo gum (n=55). Patch and active gum generated a higher abstinence rate at 12 months (13%) than patch and placebo gum (0%) (p<0.01). 90-day alcohol abstinence rates were somewhat higher in the active gum group (43%) compared with placebo gum (32%) but the difference was not significant.

Dunn et al (2009, prospective cohort [+]) provided 2-weeks stop-smoking treatment (with daily urine and breath sampling plus another sampling 30 days after the target quit day) to 28 smokers enrolled in opioid maintenance treatment. There were 12 abstainers with confirmation of abstinence in >90% of biochemical verifications and 16 non-abstainers. Assays were conducted for presence of opioids, cannabis, cocaine, benzodiazepines, and other substances. Abstainers and non-abstainers had 99% and 96% samples negative for all illicit drugs.

Grant et al (2007; RCT, [+]) randomised 58 people undergoing treatment for alcohol use disorder to receive nicotine patch + 300mg bupropion/day (n=30) or nicotine patch + placebo bupropion (n=28) and behavioural support to aid smoking cessation. Smoking

cessation rates (self-reported 7-day point prevalence) at 6-months were not significantly different between bupropion and placebo groups (17% vs. 29%, p=0.35). At 6-month follow-up there was no differences in alcohol abstinence rates (no use in last 30 days) by treatment group. However, 6-month alcohol abstinence rates were greater in those abstinent from smoking at 6 months (13/13) compared to those who were smoking (17/27), p=0.016.

Haug et al (2004; RCT, [+]) randomised 63 pregnant opioid dependent smokers to motivational enhancement therapy (n=30) or usual care (n=33) to help them quit. Women were followed up at 10-weeks and smoking abstinence (CO validated) and illicit drug use (detected in urine samples) was measured. No significant difference in tobacco abstinence rates was found (p-value not reported). No significant differences in illicit drug use were found between reported between motivational enhancement therapy and usual care groups. Positive tests for marijuana, cocaine, and opioids were seen in 6%, 26% and 28% or women respectively. 45% of women had positive test for either cocaine of opioids (45%).

Joseph et al (1990, prospective cohort [+]) compared data from 445 patients admitted to an inpatient substance abuse programme pre smoking ban and 457 post smoking ban. (The ban allowed smoking outside hospital buildings). Questionnaires were completed by 91% and 65% of pre and post-ban patients respectively. In the post-ban sample, a greater proportion of smokers abstained for at least a week (41% vs. 9%. P<0.001), reported not smoking regularly (58% vs. 19%, p<0.001), and planned to quit smoking (42% vs. 32%, p<0.001). There was no difference in the proportion of patients who thought that quitting would threaten sobriety (32% vs. 28%, p=0.22).

Joseph (1993a, prospective cohort [+]) followed up the study above (Joseph et al. 1990) by contacting 319 patients by telephone about 1-year after discharge. 156 were treated in an inpatient substance abuse programme before the hospital implemented a smoking ban and 163 were treated after the ban (the ban allowed smoking outside hospital buildings). There was no difference in the proportion of patients who claimed to have an improvement in their chemical dependence (97% vs. 89%, p=0.15). Self-reported abstinence from smoking was higher in the post-ban group (11%) than the pre-ban group (3%), p<0.05.

Joseph et al (1993b, retrospective cohort [-]) reported on patients hospitalised before and after a drug and alcohol treatment unit moved to new premises where smoking was not permitted in-doors. Data from 154 patients hospitalised post- smoking ban who responded to follow-up (out of 168) were compared with data from 160 responders hospitalised pre-smoking ban (out of 176). The two groups did not differ in drug or alcohol use recovery, although when non-responders were included as treatment failures, the recovery rate of cocaine users was lower in the post-ban group (71% recovered in the pre-ban group vs. 40% in the post-ban group, p<0.05).

Joseph et al (2004, RCT [+]) randomised 499 smokers in treatment for alcohol dependence to a concurrent (during treatment, n=251) or delayed (6 months later, n=248) smoking cessation intervention. There was no significant difference in self-reported 7-day tobacco abstinence rates at 18 months (9% in both groups). There was also no difference in the primary measure of alcohol abstinence (41% in the concurrent group vs. 48% in the delayed group, p=0.14). When using a softer measure of alcohol abstinence, a significant difference appeared (48% vs. 60%, p=0.01). The time to first use of alcohol was also significantly shorter in the concurrent group than in the delayed group (p=0.025). Given that the stop-smoking treatment did not affect smoking rates, any impact on alcohol use would seem to be due to factors other than nicotine deprivation.

Kalman et al (2001, RCT [+]) randomised 36 male smokers from an inpatient veteran substance abuse treatment programme to begin smoking cessation 2 weeks (concurrent treatment) or six weeks (delayed treatment) after admission. Number of drinks per day and percent days of alcohol use were recorded for the 90 days previous to admission and the 20-week period after admission. At the 20-week follow up more people in the delayed condition (n=6) compared to the concurrent condition relapsed back to alcohol (n=3), however this was not significant ($p<0.07$). No significant difference was seen in smoking abstinence rates between concurrent (n=3) and delayed (8%) treatment conditions ($p=0.74$).

Reid et al. (2008, RCT [+]) randomised 225 smokers in drug and alcohol maintenance and treatment programmes to smoking cessation treatment to accompany their usual treatment (SC) or the usual treatment only (control). Quit rates were 0% in the control group and about 10% in SC. The two groups did not differ in rates of retention in substance abuse treatment, abstinence from primary substance of abuse, or craving for primary substance of abuse.

Richter et al (2005, prospective cohort, [-]) recruited 28 patients who smoke from a methadone clinic and followed them up for 6-months following the start of smoking cessation treatment. They received a 7 week course of bupropion along with 12-weeks of nicotine gum and six sessions of motivational interviewing. The 6-month CO validated abstinence rate was 14%. There was no significant change in the group as a whole in the proportion of patients using illicit drugs.

Shoptaw et al (1996, prospective cohort, [-]) recruited 17 outpatients who smoke on methadone maintenance, to participate in a 4-weeks contingency management study for smoking cessation. Thrice weekly breath test for CO and urine tests for illicit drug use were undertaken. Although none managed to stop smoking completely during the study, 4 patients managed 3 or more consecutive days of abstinence. Nearly all (16/17) used illicit opiates and 10/17 used cocaine at least once during the study. However those able to abstain for even a few days was significantly less likely to use cocaine ($p<0.01$). There was no significant association between smoking cessation and illicit opiate use.

Shoptaw et al (2002, RCT [+]) randomised 175 outpatients who smoke and on methadone maintenance to 12 weeks treatment with (1) patch only, (2) a relapse prevention intervention (RPI) + patch, (3) contingency management (CM) + patch + RPI or (4) CM + patch. Thrice weekly breath test for CO and urine tests for illicit drug use during treatment and once at 6 and 12-month follow-up. Overall, smoking abstinence was a significant predictor of opiate abstinence ($p=0.0002$) and cocaine abstinence ($p<0.0001$). Individuals receiving the RPI, compared to the other interventions, were more likely to be abstinent from opiates ($p<0.0001$).

The results of these additional studies tally with the findings of the systematic review and do not raise any additional concerns.

Systematic reviews

Prochaska et al (2004, systematic review, [+]) reviewed 19 RCTs that investigated smoking cessation interventions in patients in substance misuse treatment or recovery. Smoking cessation interventions increased tobacco abstinence rates at the end of treatment (7-day abstinence rates 12% vs. 3% in control groups, RR=2.03 CI: 1.21-3.39) but not at long-term follow-up (7% vs. 6%). Regarding the decreased use of other substances, there was no difference between smoking cessation intervention and control groups at the end of treatment (RR=1.10, CI:0.93-1.29), but a significant positive effect at longer term follow-up

(37% vs. 31%, RR=1.25, CI:1.07-1.46). As this is the opposite of the impact the interventions had on smoking, the finding awaits explanation. The review provides no comparison of later drug outcomes between patients who initially stopped smoking versus those who continued to smoke.

Kodl et al (2006, general review, [+]) considered some issues of concurrent or sequential smoking cessation in patients treated for alcohol problems. The authors point out that in studies reviewed by Prochaska et al (2004) very few smokers stopped smoking, and conclude that alcohol-dependent smokers prefer sequential treatment; and that simultaneous treatment can negatively impact alcohol use outcomes, although the literature is not conclusive.

Okoli et al (2010, general review [+]) conducted a review of the literature on smoking cessation interventions in patients on methadone maintenance. The authors identified eight studies, five of which assessed drug use outcomes (Campbell et al 1995; Haugh et al 2004; Richter et al 2005; Shoptaw et al 1996; Shoptaw et al 2002). The conclusion drawn was that smoking cessation treatment does not worsen substance abuse.

INTERPRETATION

Randomised controlled trials of stop-smoking interventions show that the provision of such treatments does not undermine concurrent treatments for alcohol and opiate dependence. However, a more pertinent question of whether abstinence from smoking (as opposed to being in a group offered a stop-smoking treatment) undermines such treatments is not answered well by these studies. This is because the majority analysed only the effects of treatment allocation, and the large majority of smokers did not manage to stop smoking.

Other types of studies provide better information on whether abstinence from tobacco has a positive, negative, or no impact on ability to abstain from other substances. One study showed that the urge to drink following a cue exposure was not affected by tobacco abstinence acutely. One small RCT showed that people who reported not smoking at 6-months were more likely to have better alcohol outcomes that those who were smoking. Three studies compared treatment outcomes before and after hospitals became smoke-free. One of these provides a tentative suggestion that tobacco withdrawal may have a negative effect on treatment for cocaine dependence, but otherwise there were no negative outcomes, and the bans encouraged more smokers to quit. One study comparing objectively measured substance use in maintenance patients who did and did not stop smoking found no effect of tobacco abstinence, though this was a group in very solid remission with drug abstinence rates of almost 100%. Reassuringly, the majority of patients in substance abuse treatments did not think that stopping smoking would threaten their sobriety.

The questions of whether stopping smoking helps with or undermines drug and alcohol sobriety, and whether concurrent or sequential treatments yield better results, have not been fully answered so far and await future trials.

SECTION 4: EFFECTS OF SMOKE-FREE POLICY ON PSYCHIATRIC SYMPTOMS

There is a concern that banning smoking on psychiatric wards may have negative effects on patients' wellbeing and symptoms. We found 16 relevant studies addressing this issue. These are summarised in Table 16.

Table 16: Summary of studies included in Chapter 2 Section 4

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Cole et al (2010)	Retrospective cohort study	USA Patients on olanzapine or clozapine before and after smoking ban.	Psychiatric symptoms (BPRS) and Global Assessment of Functioning (GAF)	Decrease in GAF, i.e. worsening of symptoms. Increase in PRN medication in the first few months, decrease thereafter.	Quality +
Cormac et al (2009)	Retrospective cohort study	UK 48 smokers before and after a smoking ban	Doses and plasma levels of clozapine	A 25% increase in clozapine levels >1000 mcg/ml after the ban	Quality +
Cormac et al (2010)	Retrospective cohort study	UK 289 patients (217 smokers) admitted to psychiatric institution over 8-month period.	Incidents, changes in medications and use of NRT from medication charts over 4-month pre and post ban.	No effect on self-harm, verbal abuse, physical aggression and damage to property. Decrease in medication dosing post-ban.	Quality +
El-Guebaly et al (2002)	Review (not systematic)	Literature on smoking bans in mental health and addiction settings.		7 studies that report on effects of total smoking bans. Six reported on change in behaviour.	Quality -
Greenman & McClellan (1991)	Case study	USA 4 patients adversely affected by a total smoking ban.		Considerable staff time spent assessing patients' ability to leave the unit to smoke.	Quality -
Harris et al (2007)	Retrospective cohort study	Canada 119 patients 1-year before and after smoke-free policy.	Physical health, psychiatric symptoms and disruptive behaviours from clinical records.	Post ban smokers less likely to be in a good mood. An increase in plasma clozapine levels and subsequent decrease in dose.	Quality +
Hempel et al (2002)	Retrospective cohort study	USA 140 patients at maximum-security hospital for at least 4 weeks before and after ban.	Disruptive behaviours, medication for agitation, weight gain.	Reduction in disruptive behaviour in moderate and heavy smokers.	Quality +
Hollen et al (2010)	Retrospective cohort study	70 psychiatric hospitals at two time points.	Smoking as precursor to seclusion, smoking related health conditions,	Smokefree policy linked to reduction in smoking as a precursor to seclusion, smoking related health	Quality +

			coercion or threats, elopements and fires.	conditions and coercion or threats	
Meyer (2001)	Before-After case control study	USA 11 patients with schizophrenia receiving stable clozapine doses for at least 30 days.	Changes in clozapine levels after a smoking ban.	Levels were lower pre-ban compared to post-ban.	Quality +
Quin et al (2000)	Prospective cohort study	USA Acts of aggression over one month before and after smoking ban.	Overt Aggression Scale	There was a reduction in verbal and physical acts of aggression	Quality +
Resnick & Bosworth (1989)	Retrospective cohort study	USA 30 consecutive charts from a month before and a month after ban on acute ward	Chart reviews.	No change in drug doses, PRN medications, episodes of seclusion or restraint or discharges against medical advice.	Quality +
Ryabik et al (1994)	Prospective cohort study	USA 194 admissions to a locked psychiatric unit 6 weeks before and after ban.	Security calls per shift, seclusions and restraints, assaults, PRN medications for agitation, NRT gum use, discharges against medical advice.	Few changes	Quality +
Shetty et al (2010)	Retrospective cohort study	UK 56 patient records, resident 3 months before and after, and again 12 months after the ban on smoking on hospital grounds.	Smoking rates, incidents of smoking related aggression, use of tranquillising medicine, serum clozapine levels and use of NRT	Reduction in incidents and aggression post-ban. 23 smokers on clozapine had increased concentrations, 4 needed dose reduction.	Quality +
Smith et al (1999)	Prospective cohort study	USA 60 patients, 44 smokers admitted to inpatient unit with enforced smokefree policy	BPRS	Mean BPRS scores decreased over 3 days in both smokers and non-smokers.	Quality +
Velasco et al (1996)	Retrospective cohort study	USA 289 patients on a psychiatric unit immediately after the ban and again 2-years later.	Patient records reviewed for calls for security assistance, assaults, PRN use of medication	Increase in verbal assaults and prescribing of PRN medications for anxiety immediately after the ban. Not observed two years later.	Quality +
Voci et al (2010)	Retrospective cohort study	Canada Staff views on change in patient behaviour at 2-7 (n=481) and 31-33 months (n=500)	Staff perceptions and emergency calls before and after ban	More withdrawal symptoms after ban but no change in emergency calls	Quality +

		post ban			

We did not find any systematic reviews of this topic.

El-Guebaly et al (2002, review [-]) reviewed several studies of smoking bans in mental health and addiction settings. Six studies reported on changes in patients' behaviour. Five of these studies (Resnick & Bosworth 1989, Haller et al 1996, Velasco et al 1996, Smith et al 1999, and Quit et al 2000) are described below together with a number of other studies not included in this review. One report (Dingman et al 1988, which according to El-Guebaly et al. found no negative effects of the ban on patient behaviour) could not be obtained and has no abstract.

The majority of the studies described below compare data from hospital records before and after the implementation of a smoke-free policy. Three such reports concerning hospitals treating patients with addictions (Joseph et al. 1990, 1993a, 1993b) were reviewed in Part 3.

Cole et al (2010, retrospective cohort [+]) studied 26 psychiatric patients on olanzapine or clozapine hospitalised before and after implementation of a smoking ban. The authors describe the implementation of a smoke-free environment, but some patients were still able to obtain contraband cigarettes. Psychiatric symptoms (BPRS) and Global Assessment of Functioning (GAF) scores were collected. Patients showed a significant decrease in GAF (39.0 vs. 36.5, $p<0.001$) indicating a worsening of psychiatric symptoms post-ban. There was a significant increase in PRN medication use ($p<0.001$) in the first few months following the ban, but this decreased in the reminder of the year. Other changes were not significant.

Cormac et al (2010, prospective cohort [+]) audited data from 289 patients (217 smokers) admitted to a psychiatric institution over an 8-month period (4-months pre and 4-months post smoking ban). The facility was a secure unit and a total ban was enforced. Among smokers there were no significant differences in pre vs. post ban incidence of self-harm (61 vs. 61), verbal abuse (95 vs. 85) physical aggression (22 vs. 30) and damage to property (2 vs. 2; total count 180 vs. 178). Data were also collected in the first week of the 4 months pre ban and the last week of the 4-months post ban. The results showed a significant increase in incidents (158 pre-ban vs. 198 post ban, $p=0.01$). There was a significant decrease in the mean dose of antipsychotics post-ban (64.06, vs. 61.16, $p=0.025$). No significant changes were seen in the need for PRN medications.

Greenman & McClellan (1991, case study [-]) report on four patients who were adversely affected by a total smoking ban in a secure mental health unit. Two cases involved patients being transferred to facilities where they could smoke. Considerable staff time was spent assessing patients' ability to leave the unit to smoke.

Harris et al (2007, retrospective cohort [+]) studied 119 psychiatric patients in a maximum-security unit and in an open ward. Across the wards, compared to the year before the implementation of a total smoking ban, post ban smokers were less likely to be in a good mood. They also gained approximately 5 kg of weight. Smokers showed a significant increase in plasma clozapine levels and a subsequent decrease in daily clozapine dose. In the open wards, there was a significant increase in aggression towards staff. There were almost no adverse reactions in patients in the maximum-security unit.

Hempel et al (2002, retrospective cohort [+]) reported on 140 patients staying in a maximum-security psychiatric hospital for at least four weeks before and after the

implementation of total smoking ban. There was no significant change in disruptive behaviour among non-smokers and light smokers. A significant reduction in disruptive behaviour was seen in moderate (49% decrease, p=0.025) and heavy smokers (49% decease, p=0.007). Similar patterns were seen in reduction of sick calls (calls for assessment of physical illness) after the implementation of the smoke-free policy, with moderate (54% reduction, p=0.038) and heavy smokers (61% reduction, p=0.008) showing significant changes. Instances of verbal aggression decreased in light (0.39-0.30, ns), moderate (0.72-0.36, p=0.056) and heavy (0.34-0.11, p=0.034) smokers. All groups gained 7-8 pounds of weight post-ban.

Hollen et al (2010, retrospective cohort [+]) collected data from 70 psychiatric hospitals at two time points (2006 and 2008). All hospitals allowed smoking in 2006, but 28 (40%) banned smoking in hospital (including outside areas, and applied to all staff, patients and visitors) by 2008. In hospitals that had implemented smoke-free policy there was a significant reduction (pre vs. post) in reporting smoking as a precursor to seclusion (9 vs. 1, p=0.021), smoking related health conditions (21 vs. 5, p=0.001) and coercion or threats incidents (14 vs. 2, p<0.001). There were no significant changes in the numbers of hospitals reporting elopements or fires. The only significant change in hospitals that still allowed smoking was a reduction in coercion and threats incidents (22 vs. 10, p=0.04).

Resnick & Bosworth (1989, retrospective cohort [+]) reviewed 30 consecutive charts of patients on an acute locked psychiatric ward from a month before and a month after implementation of a smoke-free policy (total smoking ban). There were no significant changes in antipsychotic drug doses, PRN (as required) psychotropic medications dispensed, episodes of seclusion or restraint or discharges against medical advice.

Ryabik et al (1994, prospective cohort [+]) collected data from 194 admissions to a locked psychiatric unit for 6 weeks before and after the implementation of smoke-free policy. However, despite a total smoking ban within the unit, patients could smoke during out of hospital activities. The following outcomes are presented as number of events per 100 patients per week (pre vs. post smoking ban): security calls (4.5 vs. 4.3, ns); seclusions and restraints (8.7 vs. 11.0, ns); verbal assaults (9.5 vs. 29.5, p=0.075); physical assaults (1.5 vs. 2.8, ns); number of PRN medications for agitation (12.8 vs. 27.5, p<0.05); pieces of nicotine gum dispensed (6.2 vs. 38.8, p<0.01); and discharges against medical advice (0.17 vs. 0.50, ns).

Shetty et al (2010, retrospective cohort [+]) reviewed records of 56 hospitalised patients, 3 months before and after, and again 12 months after the introduction of a total smoking ban in hospital buildings and grounds. 50 patients were smokers. 27 of them used NRT following policy implementation. The number of incidents of verbal aggression 3-months pre and 3-months post ban was 29 vs. 16 (p=0.9), physical aggression 20 vs. 11 (p=0.6); there was no significant change in the use of tranquillisers.

Smith et al (1999, prospective cohort [+]) followed up 60 patients (44 smokers) admitted to an secure inpatient psychiatric unit with an enforced smoke-free policy. Mean BPRS scores decreased over 3 days in both smokers (31.8, 29.4, 28.0) and non-smokers (33.8, 32.7, 32.9). The change in scores between day 1 and 3 was significant in smokers (p<0.001), but not non-smokers. The change in score of the hostility item of the BPRS between days 1 and 2 decreased in smokers (p=0.001), and showed a small, but non-significant increase in non-smokers. 10 smokers used nicotine gum, but most used it only once or twice.

Quin et al (2000, prospective cohort [+]) recorded patients' acts of aggression (using the Overt Aggression Scale) over one month before and after the implementation of smoke-free

policy (no use of tobacco in any part of the hospital campus). There were 1184 verbal acts of aggression before and 656 after the policy was introduced (45% decrease, p<0.01). Similarly there was a decrease in physical acts of aggression (266 before vs. 133 after, 50% decrease, p<0.01)

Velasco et al (1996, retrospective cohort [+]) assessed behaviour in 289 patients on a psychiatric unit immediately after the implementation of a smoke-free policy and again 2-years later. There was a significant increase in verbal assaults and prescribing of PRN medications for anxiety immediately after the ban. However this was not observed two years later.

Voci et al (2010, retrospective cohort [+]) surveyed staff at a large mental health and addiction teaching hospital on their views towards smokefree policy and change in patient behaviour at 2-7 (n=481) and 31-33 months (n=500) post implementation of an indoor smokefree policy (patients could still smoke outside). An objective measure, number of emergency codes called before and after implementation, was also used. The only significant change over time was an increase in agreement that patients were experiencing more withdrawal symptoms after implementation of the smokefree policy (p<0.001). There was no significant change in the emergency codes called during the year before and after the smokefree policy.

We found three reports of the effects of smoking bans on plasma clozapine levels.

Meyer (2001, case control study [+]) studied clozapine levels in 11 patients with schizophrenia before and after a complete smoking ban in a psychiatric hospital (Meyer 2001). Mean plasma clozapine concentrations pre ban was 550+/-160 ng/ml, rising to 993+/-713 ng/ml post-ban, an 80% increase (p<0.034). One patient who had plasma concentration of 3066 ng/ml post ban (261% increase from baseline) suffered aspiration pneumonia.

Cormac et al (2010, retrospective cohort [+]) studied records of 48 smokers before and after a hospital smokefree policy was implemented. Before the ban 2/48 (4.2%) patients had a clozapine level >1000 mcg/ml and mean plasma clozapine concentration was 500 mcg/ml. After the ban 14/48 (29.2%) patients had a clozapine level >1000 mcg/ml and mean plasma clozapine concentration was 900 mcg/ml (p=0.0005).

Shetty et al (2010, retrospective cohort [+]) shows that in 23 smokers on clozapine, there was a significant increase in plasma clozapine concentrations post ban (p=0.0006) and four patients required a dose reduction. At 12 months post policy implementation there was no record of aggression related to nicotine withdrawal.

INTERPRETATION

The reviewed papers provide mixed information, with some studies reporting some negative impact on patient symptoms and behaviour (mostly only during the initial implementation), some finding no adverse effects, and a few studies reporting positive effects. The coverage and enforcement of the smokefree policy, that were not always well described within the studies, may influence the patient outcomes of smoking bans. Partial bans, where smoking is allowed on grounds, or on outings, may result in different outcomes than total smoking bans that prohibit smoking in buildings and on hospital grounds.

It is unknown if negative symptoms experienced by patients who are unable to smoke are secondary to tobacco withdrawal or changes in blood drug levels.

The bans generated an increase in patients' weight, and an increase in systemic levels of clozapine. The striking finding in some studies of patients being more subdued after the ban than before the ban may have been the result of increased sedation due to elevated systemic levels of medication in smokers now unable to smoke.

As the ban on smoking in psychiatric institutions has been implemented across the NHS, the issue is largely academic, though the findings may be relevant for considerations of further bans of smoking also on hospital grounds.

EVIDENCE STATEMENTS

EFFECTS OF SMOKING CESSATION ON PSYCHIATRIC SYMPTOMS

Most of the experimental studies reviewed above had methodological problems but some studies produced interpretable findings. Enforced abstinence from smoking can induce acute discomfort, but in the small self-selected group of patients who manage to achieve longer-term abstinence, no deterioration of mental health was observed. Bupropion promotes smoking cessation and may have positive effects on mood, but the evidence for positive effects of NRT is weaker.

ES 2.1 There is strong evidence that PTSD patients who manage to stop smoking do not experience any worsening of their condition (McFall et al 2005, RCT [+]; McFall et al 2010, RCT [++])

ES 2.2 There is good evidence that in patients with schizophrenia, overnight abstinence from smoking can increase negative symptoms (Smith et al 2002, cross over trial, [++])

ES 2.3 There is moderate evidence that short (7 days) smoking abstinence does not lead to cognitive deterioration but may slow down psychomotor speed (Evins et al 2005a and 2005b, RCT [+])

ES 2.4 There is weak to moderate evidence that patches may decrease agitation in smokers with schizophrenia with acute symptoms admitted to non-smoking wards but increase involuntary movements (Allen et al 2011, RCT [+], Dalack et al 1999, RCT [+])

ES 2.5 There is strong evidence that treatment with bupropion for smoking cessation does not lead to any deterioration in mental health (Tsoi et al 2010a, systematic review [+]; Tsoi et al 2010b, systematic review [+]; Banham & Gilbody 2010, systematic review [+]; Evins et al 2001, RCT [+]; Evins et al 2005a and 2005b, RCT [+]; Evins et al 2007, RCT [+]; Fatima et al 2005, cross over trial, [+]; George et al 2002, RCT [+]; George et al 2008, RCT [+]).

ES 2.6 There is moderate evidence that treatment with bupropion may lead to improved mood and reduction in akathisia (Evins et al 2001, Evins et al 2007, RCT [+]; RCT [+]; George et al 2002, RCT [+])

ES 2.7 There is strong evidence that receiving smoking cessation interventions does not adversely affect mental health (Allen et al 2011, RCT [+]; Baker et al 2006, RCT [+]; Evins et al 2001, RCT [+]; Evins et al 2005a and 2005b, RCT [+]; Evins et al 2007, RCT [+]; Fatima et al

2005, cross over trial, [+]; Gallagher et al 2007, RCT [+]; George et al 2000, RCT [+]; George et al 2002, RCT [+]; George et al 2008, RCT [+]; Williams et al 2010, RCT [+]).

ES 2.8 There is good evidence that among patients with schizophrenia or schizoaffective disorder, those who manage to stop smoking do not experience any worsening in their condition (Evins et al 2007, RCT [+]; Gallagher et al 2007, RCT [+]; Williams et al 2010, RCT [+])

ES 2.9 There is moderate evidence that mood improves in depressed smokers who manage to stop smoking compared to those who fail in their quit attempt (Blalock et al 2008, prospective cohort [+]; Thorsteinsson et al 2001, RCT [+])

EFFECTS OF STOPPING SMOKING ON PSYCHIATRIC MEDICATION

All the reviewed medications seem to be metabolised faster by smokers than by non-smokers. The corollary of this finding is that in stable patients on well-tolerated medication doses, stopping smoking is likely to increase systemic levels of these drugs and needs to be accompanied by dose adjustments. We found no data on whether NRT mitigates the effects of stopping smoking on increasing systemic levels of these medications, but it is unlikely to do so.

ES 2.10 There is strong evidence that clozapine and olanzapine are metabolised much faster by smokers, and stopping smoking can increase their systemic levels (Derenne & Baldessarini 2005, case study, [-]; Dettling et al. 2000, prospective cohort [+]; Diaz et al 2005, randomised non-controlled trial, [+]; Haring et al. 1989 retrospective cohort [+]; Haslemo et al 2006, prospective cohort [+]; Meyer 2001, case control study [+]; Ozdemir et al 2001, prospective cohort [+]; Pettitt et al. 2009, case study, [-]; Rostami-Hodjegan et al. 2004, retrospective cohort [+]; Sandson et al. 2007, case study, [-]; Seppala et al. 1999, prospective cohort [+]; van der Weide et al. 2003, retrospective cohort, [+]; Wenzel-Seifert et al 2011, retrospective cohort [+]; Wetzel et al. 1998, prospective cohort [+]; Callaghan et al. 1999, prospective cohort [+]; Carrillo et al. 2003, prospective cohort [+]; Gex-Fabry et al 2003, retrospective cohort [+]; Skogh 2002, retrospective cohort [+]; Wu et al. 2008, prospective cohort [+]). Although two studies found no significant effects of smoking on serum clozapine levels (Hasegawa et al. 1993, prospective cohort [+]; Palego et al. 2002, prospective cohort [+]).

ES 2.11 There is moderate evidence that haloperidol is metabolised faster by smokers than by non-smokers (Jann et al. 1986, prospective cohort [+]; Miller et al. 1990, prospective cohort [+]; Perry et al. 1993, retrospective cohort [+] found a difference, Fukunda 2000, retrospective cohort [+]) found no difference)

ES 2.12 There is moderate evidence that chlorpromazine is metabolised faster by smokers than by non-smokers (Chetty et al. 1994, retrospective cohort [+]; Pantuck et al 1982, prospective cohort, [+]; Stimmel and Falloon (1983, case study [-])

ES 2.13 There is moderate evidence that fluphenazine, perphenazine and thioridazine are metabolised faster by smokers than by non-smokers (Ereshefsky et al 1985, retrospective cohort [+]; Jin et al 2010, prospective cohort [+]; Berecz et al 2003, prospective cohort [+])

ES 2.14 There is weak evidence that methadone levels increase following a reduction in smoking (Wahawisan et al 2011, case study, [-]).

ES 2.15 There is moderate evidence that smoking does not affect the metabolism of triazolam, diazepam or midazolam (Ochs et al. 1987, prospective cohort [+]; Otani et al. 1997, prospective cohort [+]; Ochs et al. 1985, prospective cohort [+]).

ES 2.16 There is inconsistent evidence regarding the effect of smoking on alprazolam. One study showed that smoking was associated with increased clearance (Hossain et al. 1997, prospective cohort [+]). Another found that smoking had no effect on any pharmacokinetic parameters (Otani et al. 1997, prospective cohort [+]).

ES 2.17 There is weak evidence that smoking increases the metabolism of desmethyldiazepam when given orally (Norman et al. 1981, prospective cohort [+]), but not intravenously (Ochs et al. 1986, prospective cohort [+]).

ES 2.18 There is weak evidence that smoking has no effect on the clearance of carbamazepine (Martin et al. 1991, retrospective cohort, [+])

ES 2.19 There is moderate evidence that the metabolism of quetiapine (an atypical antipsychotic) is unaffected by tobacco smoke (DeVane & Nemeroff 2001, review [+]).

ES 2.20 There is weak evidence that smoking increases metabolism of two selective serotonin reuptake inhibitors duloxetine (Fric et al. 2008, retrospective cohort [+]) and fluvoxamine (Spigset et al. 1995, prospective cohort [+]).

ES 2.21 There is weak evidence that smoking has no effect on the metabolism of thiothixene (Ereshesfsky et al. 1991, retrospective cohort, [+]).

ES 2.22 There is weak evidence that smoking is associated with lower plasma levels of clomipramine (John et al. 1980, prospective cohort, [+]) and imipramine (Perel et al. 1976, retrospective cohort, [+]).

ES 2.23 There is inconsistent evidence regarding the effect of smoking on amitriptyline and nortriptyline. Two studies showed smoking was associated with lower plasma levels of these drugs (Linnoila et al. (1981, prospective cohort, [+]; Perry et al. 1986, prospective cohort, [+]) and three studies found no effect of smoking on pharmacokinetic parameters (Norman et al. 1977, prospective cohort, [+]; Rickels et al. 1983, prospective cohort, [+]; Ziegler & Biggs 1977, prospective cohort, [+]).

ES 2.24 There is weak evidence that smoking has no effect on the metabolism of zotepine (Kondo et al. 1996, prospective cohort [+]).

ES 2.25 There is moderate evidence that the metabolism of zuclopenthixol (an antipsychotic drug) is unaffected by tobacco smoke (Jaanson et al. 2002, prospective cohort [+]; Jorgensen et al. 1985, prospective cohort [+]).

EFFECTS OF STOPPING SMOKING ON THE USE OF OTHER SUBSTANCES

A number of studies show that the provision of stop-smoking treatments does not undermine concurrent treatments for alcohol and drug dependence. However, the majority of studies analysed only the effects of treatment allocation, and the large majority of smokers did not manage to stop smoking. The questions of whether actual stopping smoking helps with or undermines drug and alcohol sobriety, and whether concurrent or sequential treatments yield better results, have not been fully answered so far and await future trials.

ES 2.25 There is strong evidence that receiving smoking cessation treatment (as opposed to actually stopping smoking) does not undermine concurrent treatments for other drug addictions (Brown et al 2001, RCT [+]; Burling et al 2001, RCT [+]; Campbell et al 1995, prospective cohort, [+]; Cooney et al 2007, RCT [+]; Cooney et al 2009, RCT [+]; Dunn et al 2009, prospective cohort [+]; Grant et al 2007, RCT [+]; Haug et al 2004, RCT, [+]; Kalman et al 2001, RCT [+]; Okoli et al 2010, general review [+]; Prochaska et al 2004, systematic review, [+]; Reid et al. 2008, RCT [+]; Richter et al 2005, prospective cohort, [-]; Shoptaw et al 2002, RCT [+])

ES 2.26 There is good evidence that in alcoholics, smoking deprivation does not increase cue-induced urge to drink (Cooney et al 2003, randomised cross over trial [++])

ES 2.27 There is good evidence that abstinence from smoking does not undermine opioid maintenance treatment in successfully maintained patients (Campbell et al 1995, prospective cohort, [-]; Dunn et al 2009, prospective cohort [+]; Haug et al 2004, RCT, [+]; Okoli et al 2010, general review [+]; Richter et al 2005, prospective cohort, [-]; Shoptaw et al 2002, RCT [+])

ES 2.28 There is moderate evidence that being unable to smoke during treatment reduces the efficacy of inpatient treatment for cocaine dependence (Joseph et al 1993b, retrospective cohort [+])

ES 2.29 There is good evidence that being unable to smoke during treatment encourages successful smoking cessation later (Joseph et al 1990, prospective cohort [+]; Joseph 1993a, prospective cohort [+]; Joseph et al 2004, RCT [+])

ES 2.30 There is weak evidence that smoking cessation treatment may assist with abstinence from opiates (Shoptaw et al 2002, RCT [+]), although a small prospective cohort study showed no beneficial effect (Shoptaw et al 1996, prospective cohort, [-]).

ES 2.31 There is weak evidence that smoking cessation is associated with abstinence from alcohol at long-term follow-up (Grant et al 2007, RCT [+]).

EFFECTS OF SMOKE-FREE POLICY ON PSYCHIATRIC SYMPTOMS

Smoking bans generate a significant increase in patients' weight and in systemic levels of clozapine and probably other drugs as well. Otherwise the reviewed papers provide mixed information, with some studies reporting some negative impact on patient symptoms and behaviour (mostly only during the initial implementation), some finding no adverse effects, and some reporting positive effects.

ES 2.31 There is mixed evidence regarding the effect of smokefree policy on behaviour and symptoms in inpatients with mental illness. Five studies found some signs of worsening functioning within a few weeks of the ban (Cole et al 2010, retrospective cohort [+]; Cormac et al 2010, prospective cohort [+]; Harris et al 2007, retrospective cohort [+]; Ryabik et al 1994, prospective cohort [+]; Velasco et al 1996, retrospective cohort [+]). Three studies found no change after smoking ban (Resnick & Bosworth 1989, retrospective cohort [+]; Shetty et al 2010, retrospective cohort [+]; Voci et al 2010, retrospective cohort [+]) and four studies found improvements in disruptive behaviours (Hempel et al 2002, retrospective

cohort [+]; Hollen et al 2010, retrospective cohort [+]; Smith et al 1999, prospective cohort [+]; Quin et al 2000, prospective cohort [+])

ES 2.32 There is moderate evidence that total smoking bans generated a significant weight gain (Harris et al 2007, retrospective cohort [+]; Hempel et al 2002, retrospective cohort [+])

ES 2.33 There is good evidence showing that total smoking bans lead to increased systemic levels of clozapine and a need to lower its dosing (Meyer 2001, case control study [+]; Cormac et al 2010, prospective cohort [+]; Shetty et al 2010, retrospective cohort [+])

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CHAPTER 3

Safety of nicotine replacement use in pregnancy

INTRODUCTION

Smoking in pregnancy carries a number of risks. The majority of these are associated with non-nicotine components of tobacco smoke including carbon monoxide and heavy metals. However nicotine is also associated with risks to the foetus and pregnancy.

Most experts agree that it is best for women to avoid any form of nicotine throughout pregnancy. However most pregnant smokers in the UK continue to smoke throughout pregnancy (Hajek, West et al. 2001). For pregnant women who are having difficulty abstaining from smoking, a question arises whether NRT may provide a lower risk option than smoking.

There is an associated question of whether NRT is effective in pregnant smokers. This is covered in Review 2, which provides a systematic review of the relevant literature and meta-analysis. Here we focus on the issues of nicotine safety.

Below we present data from 27 studies that seek to determine the health effects of NRT on the foetus and newborn children. We divided the literature into experimental studies, epidemiological studies, systematic reviews, and opinion pieces. A brief interpretative summary of findings is provided at the end of each section, and evaluation and evidence statements are at the end of the Chapter.

Table 17: Summary of studies included in Chapter 3

Paper	Study Details	Population & Setting	Outcomes	Results	Quality & Notes
Coleman et al (2010)	Systematic review	5 RCTs of NRT (3 placebo-controlled, 2 non-placebo controlled)	Abstinence rates, birth outcomes adherence and side effects.	No difference in adverse pregnancy outcomes, trends for better outcomes in NRT groups.	Quality ++
Coleman et al (2012)	Randomised controlled trial	UK 1050 pregnant women assigned to 8 weeks of 15mg/16 hour patches or placebo	Abstinence rates, birth outcomes adherence and side effects.	No difference in adverse pregnancy outcomes, but active patch users were more likely to have caesarean section	Quality ++
Damgaard et al (2008)	Prospective cohort study	Finland and Denmark Pregnant women (n=4957) completed health questionnaires in 1st trimester.	Questionnaires included smoking status and use of NRT. 2,496 boys examined for cryptorchidism.	Smoking not a risk factor for cryptorchidism. Boys of NRT users regardless of smoking status had increased risk compared to never smokers.	Quality +
Dempsey et al (2002)	Prospective experimental study	USA 10 pregnant women received infusions of deuterium-labelled nicotine and cotinine	Blood and urine measurements	Increase in clearance of nicotine and cotinine during pregnancy, compared with the post partum period.	Quality ++

		during and after pregnancy after overnight abstinence from smoking.			
Gaither et al (2009)	Retrospective cohort study	USA 5716 women from monthly random sampling using birth certificates mailed questionnaires.	Self-reported if a healthcare professional recommended NRT, preterm birth and low birth weight (LBW)	225 were recommended or prescribed NRT. Those recommended NRT were more likely to have LBW or preterm baby than non-smokers.	Quality -
Hackman et al (1999) Pilot study for Kapur et al (2001)	Prospective cohort study	Canada 7 pregnant women who smoke were given 15mg/16 hour patches to use daily for a week	Serum and salivary nicotine and cotinine	Mean serum cotinine significantly decreased from baseline smoking levels.	Quality -
Hegaard et al (2003)	Quasi-randomised controlled trial	Denmark 647 pregnant smokers received counselling + 15mg/16 hr patch and/or 2mg gum for 11 weeks or usual care	Abstinence (salivary cotinine) and birth weight	Abstinence rates higher in NRT group. No differences in birth weight.	Quality +
Hegaard et al (2004)	Case control study	See Hegaard et al (2003) 75 women in the intervention group that used NRT matched with 2 comparable controls from control group.	Incidence of pregnancy related complications	No difference between the groups in number of pre-term births. No foetal deaths.	Quality +
Hotham (2006)	Randomised controlled trial	Australia 40 pregnant women received counselling or counselling plus 15mg/16hr nicotine patches for 12 weeks.	Abstinence (CO validated), adverse events	Abstinence in 3/20 vs. 0/20 of the intervention and control groups. Only 5 participants used patches for 12 weeks. No serious AEs reported.	Quality – Small sample for an outcome study
Ilett et al (2003)	Prospective cohort study	Australia 15 lactating women stopped smoking using nicotine patches (21mg for 6 weeks, 14mg for 2 weeks, 7 mg for 2 weeks).	Abstinence (CO validated); milk intake over 24hr whilst smoking and on patches; nicotine and cotinine in milk and plasma	Infant milk intake similar across conditions. Milk nicotine similar with smoking and 21mg patch. 14mg and 7mg produced lower concentrations than smoking.	Quality +
Kapur (2001)	Randomised controlled trial	Canada 30 pregnant smokers given 16h nicotine or placebo patch for 12 weeks.	Smoking status, adverse events	No effect on stopping smoking. One woman, on placebo, reported rapid and forceful foetal movements 3 hours after quitting smoking.	Quality - Small sample for an outcome study
Lassen et al (2010)	Retrospective cohort study	Denmark 72,761 women interviewed by phone at 16 and 31 weeks gestation.	NRT use and smoking status from interviews, birth outcome data from national registry.	1,828 women reported NRT use during 27 weeks of pregnancy. No effect on birth weight.	Quality +
Lehtovirta et al (1983)	Non randomised trial	Finland 31 pregnant women (8 current smokers, 23 ex-	Foetal heart rate variability, maternal blood pressure and	Gum associated with a transient decrease in the interval index of FHR	Quality – Mix of smokers

		smokers) chewed 2mg nicotine gum for 20 minutes or smoked a herbal cigarette	HR.	variability. Maternal BP and HR increased during chewing gum and smoking.	and ex-smokers
Lindbald & Marsal (1987)	RCT cross-over	Sweden 20 pregnant smokers, after overnight abstinence chewed 4mg gum or placebo	Maternal and foetal hameodynamics and blood samples	Increase in maternal HR and BP on gum, but no changes in FHR, aortic or umbilical venous blood flow.	Quality +
Lindbald et al (1988)	RCT cross-over	Sweden 24 pregnant smokers. Group 1 on normal cigarette (NC) , two NCs, 1 herbal cigarette (HC), and 2 HCs. Group 2 on 4mg gum (4G) followed by placebo gum (PG), b) 2 PGs in sequence and c) 2 4Gs in sequence.	Blood nicotine and catecholamine, maternal HR and BP and FHR and foetal blood flow.	Smoking and 4Gs increased maternal HR and BP. FHR increased after NCs, but not after 2 4Gs. A similar pattern in foetal aortic blood flow. Umbilical vein blood flow increased after NC smoking only.	Quality +
Lumley et al (2009)	Systematic review	72 RCTs of smoking cessation in pregnancy. 5 trials assessed efficacy of NRT, and 3 reported birth outcomes.	Smoking status, birth weight; pre-term birth	No difference in birth weight, number of low birth weight babies or preterm births.	Quality ++
Morales-Suarez-Varela et al (2006)	Retrospective cohort study	Denmark 76,768 women with singleton births. 250 reported using NRT, 20,603 women reported smoking, and 56,165 were non-smokers.	NRT use and smoking status from interviews, birth outcome data from national registry.	Congenital malformations did not differ between smokers and non-smokers. Higher prevalence in children of non-smoking NRT users compared to non-smokers	Quality +
Gobur et al (1999)	Prospective cohort study	USA 8-week course of 22mg/24 hour patch in 21 pregnant smokers	Blood nicotine and cotinine, FHR, biophysical profile. Doppler flow on days 1 and 4.	Nicotine and continue concentrations with patch not different from smoking. Morning FHR when smoking higher than on patch.	Quality +
Oncken et al (1996)	Randomised controlled trial	USA 29 pregnant smokers either continued smoking or abstained and used at least 6 pieces of 2mg nicotine gum per day for 5 days.	Blood nicotine and cotinine concentration, maternal and foetal haemodynamic parameters.	Significant reductions were seen in nicotine and cotinine levels in the gum group. Changes in haemodynamic parameters were greatest during smoking.	Quality +
Oncken et al (1997)	Randomised crossover study	USA 23 women used a 21mg patch or smoked ad lib for 8 hours after overnight abstinence. Crossed over after a week.	Blood samples of nicotine and cotinine concentrations, maternal BP and HR and FHR.	No significant differences seen in blood nicotine or cotinine levels between groups. There was a non-significant loss in FHR reactivity between the 2 groups.	Quality +
Oncken et al (2008)	Randomised controlled trial	USA 194 pregnant smokers on 6 weeks nicotine 2mg gum or placebo	Abstinence at 32-35 weeks gestation, birth weight, adverse events	No difference in abstinence rates. Babies born to mother using NRT were heavier. No overall difference in SAEs.	Quality +

Oncken et al (2009)	Randomised controlled trial	USA 21 pregnant women after overnight abstinence smoked, then on nicotine nasal spray + placebo patch or placebo spray + 15mg/16hr patch or placebo spray + placebo patch.	FHR, nicotine and cotinine concentrations	Blood nicotine higher with smoking than with NRT. FHR decreased on day 5 in placebo group and increased on NRT, but this treatment by time interaction did not reach significance.	Quality +
Pollack et al (2007)	Randomised controlled trial	USA 181 pregnant smokers received CBT alone or CBT + NRT for 6 weeks. NRT: choice of 16 hr patch, 2mg gum or 2mg lozenge	Abstinence (validated with salivary cotinine) and SAEs	Abstinence rates higher on NRT. No difference in birth weight, gestational age or SAEs.	Quality +
Schroeder et al (2002)	Prospective cohort study	See Ogburn et al (1999)	AEs related to patch use, pregnancy outcomes, maternal and cord nicotine and cotinine at delivery	AEs were mild and typical of patch treatment. No differences in nicotine or cotinine when smoking vs. using patches.	Quality +
Strandberg-Larsen et al (2008)	Retrospective cohort study	Denmark 87,032 women assessed for relationship between NRT use and stillbirth.	NRT use and smoking status from interviews, birth outcome data from national registry.	1,927 women used NRT. No association with stillbirth, even in women who smoked and used NRT concurrently.	Quality +
Wisborg et al (2000)	Randomised controlled trial	Denmark 250 pregnant women on placebo or nicotine patches 15mg/16hr for 11 weeks.	Abstinence and birth weight	No difference in abstinence rates. Birth weight higher on NRT.	Quality +
Wright et al (1997)	Prospective cohort study	USA 6 pregnant women admitted to inpatient unit where they could not smoke for 21 hours. 11 hours after admission given 21 mg patch.	Salivary, cotinine, maternal and foetal haemodynamic measurements.	No differences in foetal wellbeing on patch. After 8 hours on patch salivary nicotine similar to baseline.	Quality +

EXPERIMENTAL STUDIES

We found 12 studies that investigated the haemodynamic effects of NRT and/or nicotine delivery achieved with NRT. Coleman et al (2012, RCT [++]) was not captured by our literature search as it was published in 2012, but as it is the largest RCT to date is important to include in this review.

Coleman et al. (2012, RCT [++]) randomised 1050 pregnant smokers (12-24 weeks gestation) to 8 weeks of nicotine (15mg/16hr) or placebo patch with one face-to-face midwife counselling session at enrolment followed by 3 telephone counselling calls. There was no significant difference in salivary cotinine validated abstinence rates at delivery (9.4% vs. 7.6% in nicotine and placebo groups, respectively). There were no significant differences between

the groups (NRT vs. placebo) in rates of miscarriage (0.6% vs. 0.4%), still birth (1% vs. 0.4%), preterm birth (7.9% vs. 8.7%), low birth weight (11% vs. 8.3%), congenital abnormalities (1.8% vs. 2.5%) or NICU admissions (6.5% vs. 6.8%). NRT users were however more likely to have a caesarean section compared to placebo users (20.7% vs. 15.3%, OR=1.45 95%CI: 1.05-2.01). The authors concluded that this was likely to be a chance finding.

Dempsey et al. (2002, experimental study [++]) gave 10 pregnant smokers infusions of deuterium-labelled nicotine and cotinine during and after pregnancy after overnight abstinence from smoking. There was a significant increase in total clearance of nicotine (60% increase) and cotinine (140% increase) in pregnancy, compared with the post partum period, and a 54% increase in clearance of nicotine via its metabolism to cotinine. Mean plasma cotinine concentration during smoking in pregnancy was 119 ng/ml (SD=75), compared to 202 ng/ml (SD=77) postpartum ($p<0.05$).

Hackman et al. (1999, prospective cohort [-]) recruited 7 pregnant women to stop smoking and use 15mg/16 hr patches daily for a week. After one week, mean serum cotinine decreased from 247.6 (SD=96.9) to 163.7 ng/ml (SD=72.9), p=0.003.

Ilett et al. (2003, prospective cohort [+]) assessed the exposure to nicotine in infants of 15 lactating women who stopped smoking using nicotine patches. Measures were taken whilst mothers were smoking and when they stopped and wore the patches of decreasing strength. Nicotine concentrations in milk were not different between smoking and 21mg patch, but the 14mg and 7mg were associated with significantly lower concentrations of nicotine in milk than smoking ($p<0.05$). The total nicotine equivalents consumed by the infant were similar in the smoking and 21mg patch conditions, but significantly less ($p<0.05$) when women were using the 14 and 7mg patches. Blood samples were taken in 9 infants during the time mothers were using the 21mg patch. Nicotine could not be detected in any of these samples. Mean cotinine concentration was much lower than that seen in mothers (22 vs. 175 mcg).

Lehtovirta et al (1983, non-randomised trial [-]) allocated 31 pregnant smokers to chew a piece of 2mg nicotine gum for 20 minutes (N=15) or to smoke a nicotine-free herbal cigarettes for 5 minutes (N=15). Eight women were current smokers. Nicotine gum was associated with a significant transient decrease in the interval index of FHR variability. Maternal BP and HR increased transiently during chewing gum and smoking. The herbal cigarette had no influence on FHR variability.

Lindbald & Marsal (1987, randomised cross-over trial [+]) randomised 20 pregnant smokers to chew a piece of 4mg or placebo gum for 30 minutes after overnight abstinence. There was a significant increase in maternal heart rate and blood pressure following use of the gum, but no significant changes in foetal heart rate, aortic or umbilical venous blood flow.

Lindbald et al. (1988, randomised cross-over trial [+]) allocated 24 pregnant smokers to two groups. Group 1 (n=12) tested 4 smoking conditions after overnight abstinence a) one standard cigarette, b) two standard cigarettes one after the other, c) one herbal cigarette, and d) two herbal cigarettes. Group 2 (n=12) was randomly allocated to 3 conditions a) 4mg gum followed by placebo gum, b) two placebo gums in sequence and c) two 4mg gums in sequence. Both smoking and active gum increased maternal HR and BP. FHR increased significantly after standard cigarette, but the increase was not significant after two pieces of gum. A similar pattern was seen with an increase in foetal aortic blood flow. Umbilical vein blood flow increased after a standard cigarette, the other conditions had no significant

effects. Chewing one piece of gum resulted in maternal plasma levels of 12.4 ng/ml and although maternal HR and BP increased, foetal haemodynamics remained unaffected.

Ogburn et al. (1999, prospective cohort [+]) and **Schroeder et al. (2002, prospective cohort [+])**, report the same study of an 8-week course of 22mg/24 hr patch in 21 pregnant smokers. The patch was initiated during a 4-day inpatient stay. Blood nicotine levels when smoking vs. day 4 of patch treatment were 14.4 vs. 11.8 (Ogburn et al. 1999). A significant difference in morning foetal heart rate was found between smoking (142 bpm) and patch treatment (136 bmp), p=0.017. There were no differences in systolic/diastolic ratio in the umbilical artery measured on Doppler ultrasound. Adverse events were mild and typical of patch treatment (Schroeder et al. 2002). Seven women discontinued treatment because of AEs (5=rash; 1=nausea; 1=dizziness). There were 21 live births. Three suffered severe morbidity, but none were considered related to NRT.

Oncken et al. (1996, RCT [+]) randomised 29 pregnant smokers to continue smoking (n=10) or abstain and chew at least 6 pieces (and up to 30) of 2mg nicotine gum per day for 5 days (n=19). Most (15/19) women using gum managed to abstain for 5 days, and chewed 8 pieces of gum/day, on average. Significant reductions were seen in nicotine and cotinine plasma concentrations in the gum group. The changes in blood nicotine concentration were significantly greater following smoking (6.7 ng/ml to 19.7 ng/ml) compared to chewing a piece of gum (3.3 ng/ml to 5.7 ng/ml), p<0.01. The changes in haemodynamic parameters were greater in those who smoked compared to chewed gum, although none of these differences were statistically significant.

Oncken et al. (1997, randomised cross-over trial [+]) compared the effects of smoking for 8 hours with an 8-hour application of a 21mg nicotine patch in 23 pregnant smokers. Participants were crossed over to the two conditions. Blood samples were taken at baseline, then 2,3,4,6, and 8 hours after starting patch treatment. Area under the curve (AUC) plasma nicotine/time for smoking vs. patch was 89 vs. 93 ng-hr/ml, p=0.77. Mean maximum nicotine plasma concentration (Cmax) for smoking and patch were 19.7 ng/ml (SD=8.09) vs. 16.0 ng/ml (SD=3.5) and time to maximum concentration (Tmax) 5.0 hrs. (SD=2.4) vs. 3.2 hrs. (SD=1.7). There was a non-significant loss in FHR reactivity in 5/8 tracings after patch use vs. 1/6 after smoking.

Oncken et al. (2009, RCT [+]) studied 21 pregnant smokers. They smoked as normal after overnight abstinence and were then randomly assigned to one of the following groups 1) nicotine nasal spray (NNS) + placebo patch; 2) placebo spray + 15mg/16hr patch; 3) placebo spray + placebo patch. Women were instructed to start these products on their quit date. The baselines measures were repeated on day 5. Blood nicotine levels were significantly higher with smoking than with nasal spray, patch and placebo use (p=0.002). Maternal HR showed a significantly greater decrease from baseline in placebo and nasal spray users than patch users (p=0.021). FHR treatment by time interaction did not reach significance (p=0.052).

Wright et al. (1997, prospective cohort [+]) admitted 6 pregnant smokers to an inpatient unit where they could not smoke for 21 hours. After overnight abstinence (11 hours after admission) they were provided with a 21 mg nicotine patch to wear for 6 hours. Maternal and foetal haemodynamic measurements were taken at baseline, prior to patch use and 2 and 6 hours after the patch was applied. No measurable differences in foetal or maternal wellbeing were reported following application of the patch. Eight hours after patch application salivary nicotine concentration was similar to baseline.

We found 6 randomised controlled trials providing data on safety of NRT when used for smoking cessation.

Hegaard et al. (2003, RCT [+]) randomised 647 pregnant smokers to counselling (N=327) (9 session over 14 weeks) + NRT (15mg/16 hour patch and/or 2mg gum for up to 11 weeks), or control group (N=320) (single session with midwife). Abstinence in the 37th week of pregnancy (validated with salivary cotinine < 30ng/ml) was 7% (n=23) and 2.2% (n=7) for intervention and control groups, respectively (p=0.004). There was no significant difference in mean birth weight between the groups (3401g vs. 3433, p=0.6) or the proportion of LBW babies (3.6% vs. 3.0%, p=0.7).

Hegaard et al. (2004, case control [+]) reported further safety data from the same trial. A small subsample of women on NRT provided saliva samples at baseline and at least 1-week after starting and using NRT. The cotinine concentrations (ng/ml) whilst smoking versus using NRT were as follows: Gum users (n=6) 132 (SD=95) vs. 35 (SD=28) (CI:-6-200); patch users (n=7) 173 (SD=41) vs. 70 (SD=33), (CI:60-146); and combination NRT users (n=5) 246 (SD=91) vs. 105 (SD=51), (CI:47-236). There were no foetal deaths. The proportion of pre-term births (NRT users vs. controls), was 4/75 vs. 5/150 (p=0.5) and small for gestational age babies 5/75 vs. 11/150 (p=1.0).

Hotham et al. (2006, RCT [-]) randomised 40 pregnant smokers to brief counselling (N=20) or counselling plus the offer of 15mg/16hr nicotine patches for 12 weeks (N=20). Abstinence was achieved in 3/20 vs. 0/20 of the intervention and control groups respectively (significance not reported). Only five women used patches for 12 weeks. Five women in the NRT arm reported minor adverse effects (rash, 'dead arm', 'ill, flat and nauseous', increased morning sickness, depression following abstinence) but no ill effects on pregnancy were noted.

Kapur et al (2001, RCT [-]) allocated 30 pregnant smokers to 16hr nicotine patch or placebo for 12 weeks. There were four counselling sessions. There was no significant difference in abstinence rates at the end of treatment between the nicotine group (4/17) and placebo group (0/13), p=0.11. One woman, receiving a placebo patch, reported rapid and forceful foetal movements 3 hours after quitting smoking. These subsided within 20 minutes of returning to smoking. Subsequent to this adverse event the trial was stopped prematurely (it intended to recruit 20 women to each group).

Oncken et al. (2008, RCT [+]) randomised 194 pregnant smokers to either nicotine or placebo chewing gum for 6 weeks. Gum use was low (3 pieces/day in both groups). There was no difference in abstinence rates, but the nicotine gum group smoked less cigarettes per day (p<.05) and had lower urinary cotinine levels (p<.05). Importantly, babies born to mother using NRT were significantly heavier (3287g vs. 2950g, p<0.01) and had greater gestational age (p<.05). A breakdown of SAEs in the nicotine vs. placebo groups were as follows: preterm birth (7/97 vs. 16/87 p=0.027); Low Birth Weight [LBW] (2/97 vs. 16/87 p<0.001); spontaneous abortion (2/97 vs. 0/87 p=0.5); foetal death in utero (2/97 vs. 1/87 p=0.54); newborn death (2/97 vs. 1/87 p=0.60); maternal hospitalisation (9/97 vs. 8/87 p=0.90); and NICU admission (7/97 vs. 11/87 p=0.20).

Pollack et al. (2007, RCT [+]) randomised 181 pregnant smokers to 6 sessions of CBT alone (N=59) or CBT + NRT (N=122). The NRT group had a choice of 16-hour patch, 2mg gum or 2mg lozenge for 6 weeks. The study aimed to recruit 300 women, but it was stopped prematurely at interim analysis because an ill-informed study monitoring group thought that the results (which were showing a strong effect) indicated lack of efficacy. Validated abstinence rates (nicotine vs. placebo) at 7 weeks post randomisation were 18% vs. 3%

(p=0.006), and at 38 weeks 14% vs. 2% (p=0.01). There were no significant differences in birth weight, SAE, or any indicators of negative birth outcomes.

Wisborg et al. (2000, RCT [+]) randomised 250 pregnant smokers to 11 weeks of nicotine or placebo patch with 3 counselling sessions. There was no significant difference in salivary cotinine validated abstinence rates 4 weeks before EDD (28% vs. 25% p=0.52 in nicotine and placebo groups, respectively). However, women allocated to nicotine patch had significantly heavier babies (3457g vs. 3721g , CI: 35-336). There was no difference in the proportions of LBW or preterm births.

INTERPRETATION

The results from studies of the acute effects of NRT on the foetus are reassuring. In some laboratory trials, patches delivered similar amounts of nicotine as smoking, but the effects on foetus were mostly less and never more than the effects of smoking.

In women using NRT over a prolonged period of time, and in those using oral NRT products, NRT delivered substantially less nicotine than smoking. In randomised studies comparing the effects of standard doses of NRT with placebo in pregnant smokers using the drug throughout pregnancy, no adverse effects on pregnancy outcomes emerged. Two studies reported better birth weights in NRT groups compared to placebo groups.

Pregnancy seems to speed up elimination of nicotine by over 50%. That means that if the NRT dosing is to reach standard levels considered helpful, it should be increased considerably above the dosing used with people who are not pregnant.

Breast-fed infants of mothers on NRT have negligible systemic nicotine absorption.

Overall, the existing experimental literature suggests that NRT use in pregnancy is associated with lower risk than smoking. Only large studies with long follow-up can determine whether it is totally safe. The largest randomised trial of nicotine patches in pregnancy (Coleman et al 2012 [RCT ++]) did not find any adverse effects of NRT use in pregnancy, including congenital abnormalities. However Coleman and colleagues recommend some caution be applied to the interpretation of these findings due to the low rates of adherence to treatment and to the fact that a larger sample would be needed to comprehensively assess safety.

OBSERVATIONAL STUDIES

We identified 5 cohort studies comparing pregnancy outcomes in NRT users with other groups.

Damgaard et al. (2008, prospective cohort [+]) studied risk factors associated with cryptorchidism in 4957 pregnant women. The participants completed health questionnaires late in the 1st trimester. Boys (n=2,496) were examined at birth and 3-months. 128 boys were confirmed as cryptorcid. Smoking was not a risk factor. However children of NRT users (n=40) regardless of smoking status had a marginally increased risk (OR=3.04, 95%CI:1.00-9.27), compared to never smokers (adjusted for country, social class, birth weight, stress, alcohol and caffeine intake). The study does not provide a comparison between smokers who did and smokers who did not use NRT, so the effects of smoking cannot be differentiated from any effects of NRT.

Gaither et al. (2009, retrospective cohort [-]) used data from a programme which provides monthly random sampling using birth certificate data and mails questionnaires to women asking about maternal behaviours and birth outcomes. Regarding NRT use, women were asked to report whether a healthcare professional prescribed or recommended the use of NRT (this did not necessarily mean they used it). Data from 5,716 women were included, 225 of whom were smokers recommended or prescribed NRT and 637 were smokers not recommended or prescribed NRT. The odds ratio (adjusted for age, marital status, ethnicity and education) for LBW in the NRT group vs. non-smokers was 1.95 (95%CI:1.10-3.46) and for preterm birth, OR=2.05 (95%CI:1.14-3.63). The authors also looked at risk in smokers vs. non-smokers, finding a non-significantly increased risk of LBW (OR=1.36, 95% CI: 0.98-1.97). There was no analysis comparing smokers who were recommended/prescribed NRT and smokers not recommended/prescribed NRT. This makes the findings difficult to interpret.

Three papers report data from a Danish national birth cohort.

Lassen et al (2010, retrospective cohort [+]) analysed data from 72,761 women of whom 1,828 reported NRT use during pregnancy. 56% used gum, 30% patches, 27% used inhalers, and 10% used more than one product for a median period of 2 weeks. The proportion of preterm births in smokers using NRT vs. smokers not using NRT was 4.1% and 3.9% respectively. There was no significant relationship between the duration of NRT use and birth weight. Combination NRT was associated with a non-significant decrease in birth weight (b= -10.73g per week of NRT use, 95% CI:-26.51-5.05).

Morales-Suarez-Varela et al. (2006, retrospective cohort [+]) explored NRT use during the first trimester and congenital malformations. 76,768 women who had singleton births answered questions in the first 12 weeks of pregnancy. 26.8% (N=20,603) reported smoking during the first 12 weeks. Of the 56,165 woman who had not smoked in this period, 250 reported using NRT (patches, gum and inhalers). Congenital malformation data were obtained from the Hospital Medical Birth Registry. Children born to smokers did not differ in prevalence of congenital malformations compared to the children of non-smokers. Children born to ex-smokers who used NRT had a higher prevalence of congenital malformations (19/250, 7.6%) than non-smokers (2719/55,987, 4.9%), Relative Prevalence Rate Ratio (RPR)=1.6 (CI: 1.01-2.58). The group of non-smokers may have included some ex-smokers but the large majority are likely to be women who never smoked. The prevalence of malformations in smokers was 871/16812 (5.2%). The prevalence of musculoskeletal malformations was higher in children of NRT users (14/250, 5.6%) compared to non-smokers (1242/55,915, 2.2%), RPR=2.6, (CI: 1.53-4.52). When only major congenital malformations were considered, there was no significant difference (4.4% vs. 3.9%, RPR=1.13, CI: 0.62-2.07), with similar findings for major musculoskeletal malformations (2.4% vs. 1.2%, RPR=2.05 (95% CI: 0.91–4.63). The findings are difficult to interpret because no comparison was made between NRT users and smokers and quitters not using NRT and the number of NRT users is small.

Strandberg-Larsen et al. (2008, retrospective cohort [+]) assessed the relationship between NRT use and stillbirth. The sample consisted of 87,032 women enrolled between 1996 and 2002. Two per cent (N=1,927) of women reported using NRT. Over half of NRT users (N=1,091) reported to be current smokers, with the remaining 836 having quit. There were 8 stillbirths reported in NRT users, in 3 women who had quit smoking (3.6%) and in 5 who had not (4.6%). There was no significant difference in the risk of stillbirths in NRT users vs. non-users (adjusted Hazard Ratio [HR]=0.57, CI: 0.28-1.16). Nor was there any increased risk in the small sample of women who used NRT and smoked concurrently (adjusted HR = 0.83,

CI:0.34-2.00). Compared to non-smokers, smoking increased the risk of stillbirth (≤ 10 cpd: HR=1.36, CI:1.05-1.76); > 10 cpd: HR=1.94, CI:1.36-2.77).

INTERPRETATION

Given that smoking provides greater exposure to nicotine than NRT, the biological plausibility of any negative NRT effects above the effects of smoking is low.

Two national cohort studies showed no effect of NRT on still birth or premature birth.

One national cohort study found more congenital malformations in users of NRT than in non-smokers and another study found a marginally higher risk of cryptorchidism in NRT users compared to non-smokers. However, neither of these studies reported the more relevant comparison with smokers not using NRT. A high quality randomised controlled trial found no difference in congenital abnormalities in babies born to women who used nicotine patches compared to women using placebo patches.

Overall, NRT in pregnant women is safer than smoking. However data from observational studies suggest that it is probably not entirely safe. It would appear that varenicline, which has no known teratogenic effects and is more effective than NRT, should be a better option for pregnant smokers. No study has examined its efficacy and safety in this population so far. This represents a gap in knowledge.

SYSTEMATIC REVIEWS

Coleman et al. (2010, systematic review ++) conducted a systematic review and meta-analysis of the efficacy and safety of NRT in pregnancy. The authors searched literature up to August 2009 and included only RCTs. Five studies were included (all have been described above). There were no significant differences in pregnancy outcomes, though several trends favoured NRT groups. Given that only a small minority of women used NRT as recommended (most use little NRT or none), the finding is encouraging. NRT vs. control groups: Mean birth weigh: difference=158g, CI:-53.13-369.52; Preterm birth: RR=0.78 (CI:0.39-1.56), perinatal mortality: RR=0.70 , CI:0.14-3.60, post-randomisation foetal deaths RR=0.88 CI:0.30-2.56, NICU admissions RR=0.92 CI: 0.35-2.43, miscarriage and spontaneous abortion RR=1.04 95% CI:0.20-5.43. Low birth weight data could not be pooled because of heterogeneity, however pooling the data from the two placebo controlled trials (Wisborg et al. 2000 and Oncken et al. 2008) showed a lower proportion of LBW babies was observed in the NRT arms (RR=0.22, CI:0.07-0.72).

Lumley et al. (2009, systematic review ++) conducted the Cochrane Review of interventions promoting smoking cessation during pregnancy. The review included 72 RCTs. Only three of these studies, described above (Hegaard et al 2003; Pollack et al 2007; Wisborg et al 2000), concerned NRT trials that reported birth outcomes. Pooling their data showed no significant difference between the arms in birth weight, proportion of low birth weight babies, or preterm birth (OR=0.97, CI 0.61 to 1.53).

INTERPRETATION

The two reviews conclude that no experimental data are available to suggest that NRT poses risks in pregnancy. There is some evidence that NRT use improves birth weight. Such an effect could be mediated by reduction in smoking.

OTHER REVIEWS AND GUIDELINES

We found 28 non-systematic reviews of the effects of nicotine and the use nicotine replacement therapy in pregnancy. Most (n=20) recommend that NRT be considered in pregnancy for those women who have been unable to quit unaided (Benowitz 1991, Oncken 1996, Oncken et al 1998, Scalrea and Koren 1998, Benowitz et al 2000, McElhatton et al 2000, Bald et al 2000, Dempsey and Benowitz 2001, Koren 2001, Chan and Koren 2003, Fan 2003, Oncken and Kranzler 2003, Benowitz and Dempsey 2004, Rayburn and Bogenschutz 2004, Smith et al 2006, Coleman 2007, Coleman 2008, USDHHS 2008, American College of Obstetricians 2010, Treatobacco.net 2010, Clark and Nakad 2011). The advice to use NRT is based on animal data, the experimental data presented above, and on the low likelihood that NRT can cause any adverse effects over and above smoking.

The most widely used of these reviews is by Benowitz and Dempsey (2004). Its recommendations are similar to what other newer positive reviews recommend, i.e. that NRT be used in combination with behavioural support; the minimum effective dose should be used; the delivery system should be suitable for the individual's need; if a patch is preferred then 16 hour patch is recommended; and NRT should be started as early in the pregnancy as possible.

Two reviews did not provide recommendations (Wickstrom 2007, Oncken and Kranzler 2009) and six recommend that NRT should not be used in pregnancy (Slotkin 1998, Ginzel et al 2007, Pauly and Slotkin 2008, Slotkin 2008, Maritz 2009, Bruin et al 2010). Those who advise against using NRT (e.g. Pauly and Slotkin, 2008), argue that NRT efficacy in pregnant smokers is unproven, and that it is not known whether its use results in better outcomes than smoking. They suggest that other agents such as bupropion, varenicline or cytisine may be preferable and should be studied in this context.

Regarding UK recommendations, NICE public Health Guidance 26 (2010), 'How to stop smoking in pregnancy and following childbirth' concluded that there is insufficient evidence to show that NRT is effective in helping pregnant smokers quit and that there are insufficient data to confirm that NRT is safe to use in pregnant women. Subsequent recommendations were that (1) the risks and benefits of NRT use should be discussed with pregnant women who smoke; (2) NRT should only be used if smoking cessation without NRT has failed; (3) only prescribe NRT, in two week supplies, for use once women have stopped smoking; and (4) advise pregnant women to remove patches before going to bed.

CONCLUSIONS

In laboratory studies examining acute effects of NRT on the foetus, patches delivered similar amounts of nicotine as smoking, but the effects on foetus were mostly less and never more than the effects of smoking. Oral NRT products delivered substantially less nicotine than smoking and had only limited or no effects on the foetus.

In trials of NRT where women were able to use the drug throughout pregnancy, no adverse effects on pregnancy outcomes emerged.

Apart from experimental studies, which provide the cleanest evidence, some data were also provided by cohort studies. These are weaker as any associations can have a common cause or be related to external variables. E.g. women who opt to use NRT are likely to differ from women who do not on many variables including health concerns, degree of tobacco dependence, etc., and some of these differences could be related to pregnancy outcomes.

NRT use was not associated with stillbirth or low birth weight, but one study found more congenital malformations in NRT users than in non-smokers and another study found more cryptorchidism in NRT users than in non-smokers. With no comparison between NRT users and smokers presented, the results are difficult to interpret.

Two systematic reviews of this literature identified no risk of NRT for pregnancy. One review reported that NRT might help to reduce the incidence of LBW. Other reviews, opinion pieces and guidelines generally suggest that pregnant women should avoid nicotine, but if unable to stop smoking unaided, NRT should be considered. In such cases, overnight dosing should be avoided. A minority of the reviews advises against NRT use until there is better evidence that it is safe and that its use leads to outcomes that are more favourable than smoking.

Overall, the existing experimental literature did not identify any clear risks associated with NRT use in pregnancy compared to continuing smoking. This is consistent with the theoretical expectation that is unlikely that nicotine alone would pose more risk than the same drug delivered in the smoke form in higher doses together with a large number of other chemicals with known detrimental effects.

EVIDENCE STATEMENTS

The writers of this review interpret the available evidence as showing that NRT is safer than smoking, although probably not entirely safe. There are currently no safety reasons to withhold NRT from pregnant women who are unable to stop smoking without it. However, given the 'probably not entirely safe' verdict and the question marks about NRT efficacy, there would appear to be a strong rationale to examine safety and efficacy of varenicline in this population.

ES 3.1 There is strong evidence that in some conditions nicotine patches can deliver as much nicotine as smoking, but have overall smaller effects on foetal haemodynamics (Hackman et al. 1999, prospective cohort [-]; Ogburn et al. 1999, prospective cohort [+]; Schroeder et al. 2002, prospective cohort [+]; Oncken et al. 1997, randomised cross-over trial [+]; Wright et al. 1997, prospective cohort [+])

ES 3.2 There is strong evidence that oral NRT products deliver less nicotine than smoking and have smaller or no effect on foetal haemodynamics (Lehtovirta et al 1983, non-randomised trial [-]; Lindbald & Marsal 1987, randomised cross-over trial [+]; Lindbald et al. 1988, randomised cross-over trial [+]; Oncken et al. 1996, RCT [+]; Oncken et al. 2009, RCT [+])

ES 3.3 There is strong evidence that nicotine clearance is increased during pregnancy (Dempsey et al. 2002, experimental study [++])

ES 3.4 There is moderate evidence that there is minimal systemic uptake of nicotine in breast milk by the breastfed infant (Ilett et al. 2003, prospective cohort [+])

ES 3.5 No trial so far has identified any adverse pregnancy outcomes linked to NRT (Coleman et al. 2012 RCT [++]; Hegaard et al. 2003, RCT [+]; Hotham et al. 2006, RCT [-]; Kapur et al 2001, RCT [-]; Oncken et al. 2008, RCT [+]; Pollack et al. 2007, RCT [+]; Wisborg et al. 2000, RCT [+]; Lassen et al 2010, retrospective cohort [+]; Strandberg-Larsen et al. 2008, retrospective cohort [+])

ES 3.6 There is inconsistent evidence regarding positive effects of NRT on birth weight. Two studies found this (Wisborg et al. 2000, RCT [+]; Oncken et al. 2008, RCT [+]) but four studies found no effect (Gaither et al. 2009, retrospective cohort [-]; Lassen et al 2010, retrospective cohort [+]; Pollack et al. 2007, RCT [+]; Hegaard et al. 2003, RCT [+]).

ES 3.7 There is weak evidence that babies born to mothers who used NRT during pregnancy have an increased risk of musculoskeletal abnormalities compared to babies born to non-smokers (Morales-Suarez-Varela et al. 2006, retrospective cohort [+]). The prevalence of musculoskeletal malformations was higher in children of NRT users (14/250, 5.6%) compared to non-smokers (1242/55,915, 2.2%), RPR=2.6, (CI: 1.53-4.52). When only major musculoskeletal malformations were considered, there was no significant difference (2.4% vs. 1.2%, RPR=2.05 (95% CI: 0.91–4.63). The findings are difficult to interpret because no comparison was made between NRT users and smokers not using NRT and the numbers of NRT users are so small. Data from high quality study (Coleman et al. 2012 [RCT ++]) failed to show any association between NRT use and congenial abnormalities.

ES 3.8 There is moderate evidence that babies born to mothers who used NRT during pregnancy had an increased risk of cryptorchidism compared to babies born to non-smokers (Damgaard et al. 2008, prospective cohort [+]). Smoking was not found to be a risk factor. However the study does not provide a comparison between smokers who did and smokers who did not use NRT, so the effects of smoking cannot be differentiated from any effects of NRT.

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DISCUSSION, GAPS AND RESEARCH RECOMMENDATIONS

The review concerned two main clinically relevant issues. The first is whether there are any populations or circumstances where NRT use may be unsafe; and the second is whether there are any populations or circumstances where acute tobacco abstinence may be unsafe.

Regarding the safety of NRT, the review did not identify any safety concerns related to its use for stopping smoking in cardiac patients or in any other group of secondary care users. No concerns were raised about NRT safety in mental health service users either, although it may not be effective in this population. Regarding pregnancy, any risks associated with NRT use are much smaller than those associated with smoking, and may be clinically negligible. Nevertheless, given uncertainty about NRT efficacy in pregnant smokers and the possibility that it is not totally harmless, there is a need for research into the safety and efficacy of other treatments such as varenicline.

The review identified one area of NRT use that does raise concerns. It seems that in some hospitals it became a common practice to put NRT patches on ICU and surgery patients deemed to present a risk of delirium. There is little evidence that tobacco deprivation contributes to delirium. There is also no evidence that NRT patches help and there is some evidence that they may be harmful in several ways, although some of these findings are likely to be due to patient selection. No controlled trial has examined this issue. This represents a gap in evidence that would be relatively easy to fill.

Regarding effects of acute tobacco abstinence, this may affect comfort of some hospitalised patients, and it increases systemic levels of a number of medications. This is of particular relevance to patients hospitalised in psychiatric hospitals. E.g. patients on olanzapine are likely to experience a significant weight gain and increased risk of diabetes due to their medications. When hospitalised and prevented from smoking, they are at risk of further weight gain due to tobacco withdrawal and some additional weight gain and other, potentially serious, adverse effects from an increase in systemic olanzapine levels. A recommendation should be considered for routine lowering of dosing in all smokers on these medications admitted to smoke-free wards. Some studies of the effect of smokefree policies on patient behaviour noted that NRT was made available to patients but none reported on the effects of NRT on patient behaviour and symptoms. Another research need is to investigate the effect of NRT, compared to an adequate control, on level of discomfort and psychiatric symptoms in smokers with mental health illness in smokefree environments.

There is one relevant area where more evidence is needed, concerning the timing of quit attempts in people undergoing treatment for drug and alcohol dependence. It is currently not known whether stopping smoking during such treatments facilitates or undermines drug and alcohol sobriety or has no effect on it.

Appendices

APPENDIX 1 - REVIEW PROTOCOL

Review Protocol

Smoking cessation in Secondary Care

Review 1 (Component 5)

Review of effects of nicotine in secondary care

Hayden McRobbie

Katie Myers

Peter Hajek

Final Version

22 December 2011

Overview of project

The National Institute for Health and Clinical Excellence (NICE) has been asked by the Department of Health to develop two separate pieces of complementary guidance on:

- 'Smoking cessation in secondary care: acute and maternity services'
- 'Smoking cessation in secondary care: mental health services'.

The guidance will address smokefree policies and smoking cessation and make recommendations on approaches to help secondary care commissioners, professionals and managers (including patients and service users and their family or carers, visitors and staff) in hospitals and other acute, maternity or mental healthcare settings (including emergency care, planned specialist medical care or surgery, and maternity care provided in hospitals, outpatient clinics, community outreach and rural units, as well as intensive services in psychiatric units and secure hospitals).

There are five components of work associated with the guidance development:

1. Smoking cessation in acute and obstetric services: one review of effectiveness and one review of barriers and facilitators (reviews 2 & 3).
2. Smoking cessation in mental health services: one review of effectiveness and one review of barriers and facilitators (reviews 4 & 5).
3. Smokefree strategies and interventions in secondary care settings: one review of effectiveness and one review of barriers and facilitators (reviews 6 & 7).
4. An economic analysis (cost effectiveness review and economic model)
5. Review of effects of nicotine in secondary care (review 1)

The CPHE has commissioned the National Centre for Smoking Cessation and Training (NCSCT) to deliver four of these components (1,2,3 and 5).

This review protocol sets out the process for Component Five - Review of effects of nicotine in secondary care, referred to as Review 1.

The aim of this review is to ascertain the effects of nicotine in patients using secondary care services. Specifically this review seeks to ascertain:

a) the effects of nicotine intake, or changes in levels of nicotine intake, on the mental and physical health of patients and service users who are on medication and receiving support from secondary care health services
b) the effects of tobacco consumption, or changes in tobacco consumption, on the mental and physical health of patients who are on medication and receiving support from secondary care health services
c) the effects of nicotine intake, or changes in levels of nicotine intake, on the mental and physical health of patients and users of secondary care health services

1.1 The Review Team

The review will be led by Dr McRobbie (Project Team Leader) who has 12 years experience of working in tobacco control and smoking cessation research. He has led a NICE systematic review (see McRobbie et al 2006(McRobbie, Hajek et al. 2006)) and is an author of two Cochrane Systematic Reviews(Whittaker, Borland et al. 2009; Barnes, Dong et al. 2010) and one recent systematic review investigating the effects of pre-operative smoking cessation on peri-operative outcome.(Myers, Hajek et al. 2011) Dr McRobbie was also the lead author of the literature review for the New Zealand Smoking Cessation Guidelines.(Ministry of Health 2008)

Ms Myers will assist Dr McRobbie with this review. Katie Myers has lead a NICE review of Relapse Prevention Interventions in pregnancy(Myers, West et al. 2009) and was the lead author on the pre-operative smoking cessation systematic review.(Myers, Hajek et al. 2011)

Professor Hajek will provide advice and mentoring for our Project Team and will contribute to the final report. He has a long history of working with NICE and extensive experience in systematic reviews.(Hajek and Stead 2006; McRobbie, Hajek et al. 2006; Hajek, Stead et al. 2009; Myers, West et al. 2009; Parsons, Shraim et al. 2009; Myers, Hajek et al. 2011)

Nigel Chee will provide expert project management support to the Project Team given the tight timeframes for this Component. He is an experienced manager with experience in managing large and complex health research, strategy, and policy and implementation projects. He will primarily focus on driving the process for the project to ensure timelines are met and will also manage the relationships between the key stakeholders (including the Project Team, Independent Information Specialist, collaborators, NCSCT and NICE).

1.1.1 Independent Information Specialist

In addition to the skills and experience of the Project Team an independent information specialist (Ms Claire Stansfield) from the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) will provide advice on the search strategy and the approach to undertaking the literature search. Ms. Stansfield has extensive expertise in methods for identifying research for systematic reviews, is familiar with the syntax requirements of the databases used in NICE systematic reviews, and is a member of the Cochrane Collaboration's Information Retrieval Methods Group.

1.1.2 Collaborators

This review will also involve several other collaborators (listed below) who are leading components 2 and 3. The rationale for involving these wider collaborators is that we believe there are significant overlaps between the four components. Although each component “stands alone”, we believe that working as a broader collective team will enable synergies across the work to be completed. The wider team is multi-disciplinary consisting of health and clinical psychologists, clinicians, research nurses, epidemiologists and medical statisticians and covers a wide range of specialist technical expertise including mental health care, secondary care and tobacco control research.

- Professor Ann McNeill (University of Nottingham);
- Dr Jo Leonardi-Bee (University of Nottingham);
- Dr Rachael Murray (University of Nottingham);
- Dr Elena Ratschen (University of Nottingham);
- Professor Sarah Lewis (University of Nottingham);
- Ms Kathryn Angus (University of Stirling); and

- Mr Douglas Eadie (University of Stirling).

1.2 The review process

This review will involve the following steps, which are described further within this protocol.

1) Searching and retrieval of relevant evidence/studies as outlined in the search protocol and strategy (see Appendix 1)
2) Selecting relevant evidence/studies using appropriate title/abstract screening checklists (see Appendix 3). Titles/abstracts will be screened independently by two reviewers.
3) Retrieval of full papers assessed to be potentially relevant following title/abstract screening.
4) Full papers will be screened independently by two reviewers and quality assessed using the NICE quality appraisal checklists (see Appendices 4-6).
5) Data will be extracted from each paper and entered into data extraction tables (see Appendices 7 & 8).
6) Data will be collated and presented in evidence tables, narrative summaries, summary tables, graphical presentation, and meta-analysis where appropriate. Sensitivity analyses related to inequality measures will be carried out, where possible.
7) Evidence statements and applicability statements will be formulated.

1.3 Project deliverables

At the completion of this process the review team will

1 Submit a **1st draft of the review** to the NICE Team by 27 January 2012
2 Undertake any amendments to the draft following NICE comments and provide a revised draft (**2nd draft**) by 20 February 2012
3 Present the review findings to the PDG meeting on 7 March 2012
4 Undertake any amendments to the reviews following comment from the PDG and summit a **3rd draft by** 21 March 2012
5 Provision of written contributions and technical support during and after the completion of the reviews, as required during the development of the public health programme guidance. This will include:
   - Supporting the NICE Team in responding to any stakeholder comments on the reviews during the consultation on the draft guidance (consultation is currently planned for 5th April to 5th June 2013).
   - Attendance at PDG meetings as required (dates for these meetings are outlined in Annex 2).
6 Submit the **final review** following public consultation, by 31 July 2012

Background

Each year thousands of smokers are admitted to secondary care settings in the United Kingdom (UK) for treatment of smoking related diseases. For many of these people the admission and the illness represents a good motivator to stop, and brings them into contact with health care professionals who can help. Even for those people who are not ready to quit assistance may be required to help them abstain whilst in a smokefree environment.

Nicotine replacement therapy (NRT) is the most commonly used smoking cessation treatment in the secondary care setting,(NHS Centre for Smoking Cessation and Training 2011) and is effective at alleviating the symptoms of tobacco withdrawal and increases the chances of long-term abstinence.(Stead, Perera et al. 2008) There are currently seven products available on the worldwide market (patch, gum, lozenge, sublingual tablet, inhaler, nasal spray, and mouth spray). Traditionally NRT has been used primarily for smoking cessation but more recently its use has been extended to assist smoking reduction, temporary abstinence and use in combination with other NRT products.

Although NRT has a good safety profile there remains some concern about the safety of nicotine among smokers and healthcare professionals. One concern is the incorrect belief that nicotine is the main component in tobacco smoke responsible for smoking-related disease. Published data show that smokers believe that NRT products are just as likely as cigarettes to cause smoking related disease.(Bansal, Cummings et al. 2004; Shiffman, Ferguson et al. 2008) There is general agreement among experts that it is not nicotine that causes the adverse health effects associated with smoking. However health risks associated with nicotine cannot be ruled out completely. There are some data that suggest that nicotine might have adverse effects in pregnancy(Bruin, Gerstein et al. 2010) and that it might be involved in steps that increase the likelihood of some cells becoming cancerous although there is no evidence that nicotine induces cancer.(Thunnissen 2009) Other concerns focus on the adverse effects of nicotine on wound healing and the cardiovascular system.

Abstinence from smoking can result in adverse effects such as those associated with tobacco withdrawal (e.g. irritability and depression) and changes in plasma levels of some medications.(Zevin and Benowitz 1999; Hughes 2007) Smoking tobacco causes induction of the liver enzyme cytochrome P450 (CYP1A1, CYP1A2).(Zevin and Benowitz 1999) This is mainly the effect of the polycyclic aromatic hydrocarbons present in tobacco smoke. CYP1A2 is responsible for the breakdown of several medications (e.g. clozapine) and medications metabolised by this enzyme will be metabolised faster in smokers than in non-smokers. On a person's cessation of smoking these enzymes return to a normal level of activity which can result in a change in metabolism of several medications and subsequent dosage adjustments are often required.(Zevin and Benowitz 1999) These issues are relevant to many patients in secondary care settings but are pertinent important for patients with mental health illness.

Patients with mental health illness are of particular interest in the review. Not only are they more likely to be using medicines that are affected by the compounds in tobacco smoke, but there health may also be affected by the use and withdrawal of tobacco and/or nicotine. One of the hypotheses for why people with mental health illness may smoke more is that it may alleviate some psychiatric symptoms.(Glassman 1993) However, there is some evidence to suggest that smoking cessation improves some psychiatric symptoms such as anxiety and stress,(West and Hajek 1997; McNeill 2002) depressive symptoms,(Kahler, Brown et al. 2002) and lead to a general improvement in mental health.(Mino, Shigemi et al. 2000) Smoking may also reduce the side effects of some neuroleptic medications.(Lawn and

Pols 2005) It is also reported that nicotine may improve cognitive function.(Lawn and Pols 2005)

Aim

The aim of this review is to ascertain the effects of nicotine intake or changes in levels of nicotine intake including nicotine from tobacco, on the mental and physical health of people using secondary care services.

Scope

This review will be informed by the two scope documents:

1. Smoking cessation: acute and maternity services http://guidance.nice.org.uk/PHG/Wave23/22/Scope/pdf/English
2. Smoking cessation: mental health services http://guidance.nice.org.uk/PHG/Wave23/36/Scope/pdf/English

4.1 Groups that will be covered

This review will include evidence from studies of the following people of all ages who use tobacco (smoked or smokeless):

- Patients and users of acute and maternity services, including those who are in the process of being referred to hospital or have recently been discharged;
- Patients and users of secondary care mental health services, including those who are in the process of being referred to or have recently been discharged from:
  - Child, adolescent, adult and older people mental health services; and
  - Inpatient, residential and long-term care for severe mental illness in hospitals, psychiatric and specialist units and secure hospitals.

4.2 Activities / interventions that will be covered

This review will address the effects of nicotine use, or withdrawal in secondary care patients. This will include

- Interventions that help people stop smoking
- Intervention that help people temporarily abstain
- Interventions that enforce abstinence from smoking
- Smoked tobacco products
- Smokeless tobacco products
- Nicotine replacement therapy (NRT)
  - Gum
  - Transdermal patches
  - Lozenges
  - Sublingual tablets
  - Inhalator/inhaler
  - Nasal spray
  - Mouth spray

4.3 Activities / interventions that will not be covered

This review will not consider evidence relating to the adverse effects of tobacco use on general health or the health benefits of quitting in secondary care patients.

PICO table to summarise the review scope

Population

This review will include evidence from studies of the following people of all ages who use tobacco (smoked or smokeless):

- Patients and users of acute and maternity services, including those who are in the process of being referred to hospital or have recently been discharged;
- Patients and users of secondary care mental health services, including those who are in the process of being referred to or have recently been discharged from:
  - Child, adolescent, adult and older people mental health services; and
  - Inpatient, residential and long-term care for severe mental illness in hospitals, psychiatric and specialist units and secure hospitals.

Intervention/Activity

This review will address the effects of nicotine use or withdrawal, and delivered via tobacco or pharmaceutical products, in secondary care patients. This will include

- Interventions that help people stop smoking
- Intervention that help people temporarily abstain
- Interventions that enforce abstinence from smoking
- Smoked tobacco products
- Smokeless tobacco products
- Nicotine replacement therapy (NRT)
  - Gum
  - Transdermal patches
  - Lozenges
  - Sublingual tablets
  - Inhalator/inhaler
  - Nasal spray
  - Mouth spray

Comparison

Data from placebo controlled NRT trials

No intervention – data from studies of people who smoke

Data from studies of ex-smokers or never smokers

Data from studies of smoking restrictions and bans

Outcomes

The following factors and outcomes will be considered:

- Any (adverse or favourable) effects of nicotine and specific risks for secondary care patients; (note that this will not extend to the health risks associated with smoking)
- Any (adverse or favourable) effects of nicotine withdrawal for secondary care patients;
- Effects (adverse or favourable) of nicotine from NRT and nicotine withdrawal on drug interactions, specific risks and the frequency at which they occur;
- Interactions of nicotine and medication use in secondary care;
- Any effects on pharmacotherapeutic management.

It is known that the polyaromatic hydrocarbons contained within tobacco smoke also affects the metabolism of some medications therefore outcomes regarding the interactions of tobacco use and tobacco cessation will be considered.

4.4 Research questions

This review will answer the following three questions:

Question 1: What are the effects of nicotine intake, or changes in levels of nicotine intake, on the mental and physical health of people using secondary care services who are on medication?

Question 2: What are the effects of tobacco consumption, or changes in tobacco consumption, on the mental and physical health of people using secondary care services who are on medication?

Question 3: What are the effects of nicotine intake, or changes in levels of nicotine intake, on the mental and physical health of people using secondary care services?

Literature search protocol

5.1. Aims

The aim of this review is to answer three of the key questions in the final scopes for the two separate pieces of complementary guidance:

1. What are the effects of nicotine intake, or changes in levels of nicotine intake, on the mental and physical health of people using secondary care services who are on medication?
2. What are the effects of tobacco consumption, or changes in tobacco consumption, on the mental and physical health of people using secondary care services who are on medication?
3. What are the effects of nicotine intake, or changes in levels of nicotine intake, on the mental and physical health of people using secondary care services?

5.2 Search approach

This review will use a systematic approach to identify literature of the highest quality available that provides information on:

a) the effects of nicotine intake, or changes in levels of nicotine intake, on the mental and physical health of patients and service users who are on medication and receiving support from secondary care health services
b) the effects of tobacco consumption, or changes in tobacco consumption, on the mental and physical health of patients who are on medication and receiving support from secondary care health services
c) the effects of nicotine intake, or changes in levels of nicotine intake, on the mental and physical health of patients and users of secondary care health services

The review will also attempt to draw out any specific issues for different groups. For example it will be important to examine the effects of nicotine use and withdrawal on people with mental health illness.

5.3 Search questions

The key search questions are as follows:

- What are the effects of nicotine use on mental and physical health of the patients?
- What are the effects of nicotine withdrawal on mental and physical health of the patients?
- What are the effects of nicotine use and withdrawal on medications and required doses?
- What are the effects of tobacco use on the mental health of patients?
- What are the effects of tobacco use and withdrawal on medications and required doses?
- What are the effects of tobacco withdrawal on mental and physical health of the patients?

5.4 Developing the search strategy

The main search strategy has been developed to capture the following:

(1) Review population

This includes patients using secondary healthcare services. The review will all also capture the sub-population of people using medications. The following search terms will be used

Hospitalization/; Outpatients/; Outpatient clinics, Hospital/; Inpatients/ Child, Hopsitalized/; Adolescent, Hospitalised/; Hospital units/; Emergency medical services/; Emergency services, Psychiatric/; Pregnant women/; Obstetrics/; Obstetrics and gynaecology department, hospital/; Mental health services/ Patient admission/; inpatient*; outpatient*; patient*; rehabilitation; psychiatric; "day centres"; "day centers"; "day units"; "day centre"; "day center"; "day unit"; residential; "long term care"; "long-term care"; psychiatric; "mental health"; "emergency services"; "specialised care"; "special care"; "specialized care"; readmitted; "re-admitted" pregnancy/maternal medicine*; antenatal clinic.

(2) Nicotine use

Nicotine agonists/ Nicotine/ nicotine

(3) Tobacco use and cessation of tobacco use

Tobacco use cessation/; Tobacco use disorder/; Tobacco, smokeless/; Smoking cessation/; Smoking/; Tobacco/; Tobacco; cigar*; "hand-roll"; handroll*; "hand-rolls"; "hand-rolled"; bidi; bidis; beedi; beedis; rolie; rolies; paan; gutkha; snuff; betel; smoking cessation; stop* smoking; withdraw*; smoking quit*; smoking; reduce smoking; abstain smoking; temporary abstinence

(4) Use of medications and interactions

Prescription drugs/; Drug therapy/; Drug interactions/; Psychotropic drugs/; pharmacology; drugs; drug; prescribed; therapy; prescription; treatment; prescribed; therapy; therapeutic; prescription; treatment; "therapeutic drug"; "therapeutic drugs"; "drug interaction"; "drug interactions"; pharmacotherapy; adverse adj3 (event* or experience* or effect); side effect; drug therap*; pharmacolog*

5.4.1 Search strategy

The search strategy for Medline is shown in Appendix 1.

A systematic search of the grey literature will not be undertaken but hand searching of bibliographies of systematic reviews the meet the inclusion criteria will be carried out to ensure that relevant data are included in this review.

To supplement the search for evidence NICE may issue a call for evidence from registered stakeholders. Relevant evidence will be included in this review

5.4.2 Equality and Diversity

The search strategy will be inclusive and aims to capture a broad range of evidence across all ethnic and disadvantaged groups.

5.5 Electronic resources

5.5.1 Databases

The following list includes the electronic databases that will be searched

- AMED (Allied and Complementary Medicine)
- ASSIA (Applied Social Science Index and Abstracts)
- British Nursing Index
- CINAHL (Cumulative Index of Nursing and Allied Health Literature)
- Cochrane Central Register of Controlled Trials
- Cochrane Database of Systematic Reviews
- Database of Abstracts of Reviews of Effectiveness (DARE; 'other reviews' reviews' and Health Technology Assessment (HTA) database in the CRD database)
- Current Contents
- EMBASE
- HMIC (or King's Fund catalogue and DH data)
- Medline

- UK Clinical Research Network Portfolio Database
- PsycINFO
- Sociological Abstracts
- Social Policy and Practice
- Web of Knowledge (Science and Social Science Citation Indexes)
- CDC Smoking & Health Resource Library database
- Specialist (public health) systematic review registers
    - EPPI Centre DoPHER
    - Health Evidence ca

5.5.2 Websites

The following list includes the websites that will be searched

- Smoke free http://smokefree.nhs.uk
- NHS Centre for Smoking Cessation and Training http://www.ncsct.co.uk/,
- Action on Smoking and Health (ASH) http://www.ash.org.uk
- Treat tobacco.net http://www.treatobacco.net/en/index.php
- Society for Research on Nicotine and Tobacco http://www.srnt.org
- International Union against Cancer http://www.uicc.org
- WHO Tobacco Free Initiative (TIF) http://www.who.int/tobacco/en
- International Tobacco Control Policy Evaluation Project http://www.itcproject.org
- Tobacco Harm Reduction http://www.tobaccoharmreduction.org/index.htm
- Current controlled trials www.controlled-trials.com
- Association for the treatment of tobacco use and dependence (ATTUD) www.attud.org
- National Institute on drug abuse- the science of drug abuse and addiction http://www.nida.nih.gov/nidahome.html
- NICE
- Public health observatories
- Scottish Government
- Welsh Assembly Government
- NHS Evidence
- Joseph Rowntree Foundation
- The Centre for Tobacco Control Research (University of Stirling)
- UK Centre for Tobacco Control Studies
- Tobacco Control Research Group (University of Bath)
- http://www.controlled–trials.com

5.5.3 Other sources

- Medicines and Healthcare products regulatory agency (MHRA) http://www.mhra.gov.uk/index.htm
- US Food and Drug Administration (FDA) http://www.fda.gov/
- Drug Information Online http://www.drugs.com/
- Electronic Medicines Compendium (eMC) http://www.medicines.org.uk/emc/
- National electronic library for medicines http://www.nelm.nhs.uk/en/
- UK Medicines Information http://www.ukmi.nhs.uk/default.asp

5.6 Restrictions

The following inclusion and exclusion criteria will be applied to the searches.

5.6.1 Inclusion Criteria

The following will be included:

- Studies published from 1980 to the most recent available at the time if the search
- Contain information that addresses the review questions.
- Published in English

5.6.2 Exclusion Criteria

The following will be excluded:

- Animal studies; and
- Studies that do not primarily address the review questions.
- Studies not published in English

Gathering the evidence.

The search strategy will be translated for use, and then run on each of the various databases and websites.

6.1 Documenting the search process

At the completing of searching each database the following steps will be undertaken:

1. Results from the database searches will be downloaded into 'Endnote'. Items which cannot be downloaded into bibliographic software will be recorded in a Word document
2. A word document containing the search strategies for each resource searched will be created. Each strategy will include audit information, as shown in appendix 2.
3. A final de-duplicated 'Reference manager database'.

Reference details for any studies which may be of relevance to the contractors who will be undertaking components 1 (Acute & Maternity reviews), component 2 (Mental Health reviews), component 3 (smokefree reviews) or component 4 (Cost effectiveness review and economic analysis) will be recorded in EndNote and provided to the NICE Team to pass these files onto the relevant contractors.

Reviewing the evidence

Reviewing of the scientific evidence will involve the following five steps:

1) Select the relevant evidence.
2) Assess its quality.
3) Extract, synthesise and present it.
4) Derive evidence statements.
5) Assess its applicability.

Studies will be selected on the basis of relevance to the scope of this review and consideration will given to:

- Relevance to the PICO table described above
- The hierarchy of evidence
- Availability of evidence – if high quality evidence is not available then we will use the best available evidence.

7.1 Selecting the relevant evidence

7.1.1 Title/ abstract screening

All titles and abstracts obtained from the search will be independently screened by two members of our Project Team (Dr McRobbie and Ms Myers) using a screening checklist (a sample screening checklist is outlined in Appendix 3). Where there is disagreement the full paper will be obtained and resolved by discussion with the third member of our Project Team, Professor Hajek.

The following studies will be considered:

- Quantitative studies (both experimental and observational studies);
- Qualitative studies;
- Systematic reviews, reviews, reviews of reviews; and
- Information that addresses the review questions.

7.1.2 Full-paper screening

Full papers will be obtained for those abstracts that meet the criteria for inclusion and will be independently screened for inclusion by Dr McRobbie and Ms Myers. Any disagreement will be resolved with our third reviewer, Professor Hajek. The composite inter-rater reliability scores will be reported and the selection process will be summarised in a flow diagram. Each study excluded at the full-paper screening stage will be listed in the appendix of the review, along with the reason for its exclusion.

7.2 Assessment of study quality

The internal and external validity of studies will be assessed using quality appraisal checklists. The checklist for quantitative studies is provided in appendix 4, and that for qualitative studies in appendix 5. Reviews will be assessed using the checklist in appendix 6.

Each paper will be graded, by the lead reviewer (Dr McRobbie), using the rating scale summarised below. Quality of this process will be assessed by appraising 10% of papers by a second appraiser (Ms Myers) to check accuracy. Any disagreement will be resolved by a third appraiser (Professor Hajek). The composite inter-rater reliability scores will be reported. This approach was utilised in previous NICE systematic reviews completed by members of this review team.(McRobbie, Hajek et al. 2006; Myers, West et al. 2009)

7.2.1 Internal validity

The review team will use the checklists to ascertain if potential sources of bias have been minimised and to determine if its conclusions are open to any degree of doubt. Each study should be rated ('++', '+' or '-') to indicate its quality, where:

- ++ All or most of the checklist criteria have been fulfilled; where they have not been fulfilled the conclusions are very unlikely to alter.
- + Some of the checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter.
- – Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

The reasons for the quality rating will be documented in the appraisal checklist.

7.2.2 External validity

The external validity of studies will be assessed by determining the extent to which the findings for the study population are generalisable to the whole 'source population'. A rating of EV++, EV+, or EV- will be applied to indicate the degree of quality.

7.3 data extraction and synthesis

7.3.1 Data extraction

A narrative summary and evidence table will be completed for each selected study. Data will be extracted into the evidence tables and will document data regarding the: aim; objectives; setting; target population; intervention (e.g. use of nicotine replacement products); outcomes; and assessment. The template that will be used for the evidence table is shown in Appendix 7, and is based on the recommendations of the NICE CPHE Methods Manual.(National Institute for Clinical Excellence 2009) For quantitative studies exact p-values (whether or not significant) and confidence Intervals, where available, will be reported. Separate evidence tables will be produced to summarise the evidence related to each review question.

For qualitative data, analysis of the themes will be presented in the evidence tables along with a brief narrative of the paper – see Appendix 8.

7.3.2 Data synthesis

Findings from the review will be grouped into sections that will answer each review question. Subsections will be created to summarise data related to particular sub-topics. Evidence statements will be provided for each subsection. Where data allows, meta-analyses will be undertaken. Qualitative data will be themed and summarised.

7.3.2.1 Meta-analyses

Meta-analyses will be conducted using RevMan software. A fixed effect model will be used, except in situations where there is statistical heterogeneity where a random effects model will be used. Forest plots will be presented for all meta-analyses.

7.3.2.1 Narrative summaries

Narrative summaries will be provided for included studies. These will include a brief description of the study design, methodology, population, setting, and outcomes.

7.4 Evidence statements

The proposed evidence statements to be used in this evidence review will follow NICE recommendations. Statements will contain a descriptor, strength, and direction (positive or negative) of the evidence. Quality ratings of studies will be used to formulate the strength. The overall strength will be summarised using the following:

- No evidence
- Weak evidence
- Moderate evidence
- Strong evidence
- Inconsistent evidence

Evidence statements will also be developed from qualitative data. These will summarise the quality, context and key findings, and state the degree of concurrence between studies.

7.5 Applicability statements

The degree of applicability of the evidence, summarised in each evidence statement in this review, to the UK setting will be assessed. For each study included the reviewers will assess characteristics of the population, setting, intervention and outcomes studied. An applicability statement, showing the applicability of the evidence to the UK setting will be formulated and presented after each evidence statement using the following terms:

- directly applicable
- partially applicable
- not applicable.

7.5.1 Issues related to Inequalities

Any issues related to inequalities that appear in the literature will be flagged and summarised in a separate section of the final report.

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Appendix 1: Search strategy for Medline

MEDLINE strategy

No.	Database	Search term	Hits
1	MEDLINE	nicotine.ti,ab	25887
2	MEDLINE	NICOTINIC AGONISTS/ OR NICOTINE/	21319
3	MEDLINE	1 OR 2	31267
4	MEDLINE	PRESCRIPTION DRUGS/	1583
5	MEDLINE	pharmacology.sh	32243
6	MEDLINE	exp DRUG THERAPY/	971760
7	MEDLINE	exp DRUG INTERACTIONS/	132358
8	MEDLINE	exp PSYCHOTROPIC DRUGS/	305096
9	MEDLINE	"drug therapy".sh	33169
10	MEDLINE	((drug adj2 prescrib*) OR (drug adj2 therapy) OR (drug adj2 therapeutic) OR (drug adj2 prescription) OR (drug adj2 treatment) OR (drugs adj2 prescrib*) OR (drugs adj2 therapy) OR (drugs adj4 therapeutic) OR (drugs adj2 prescription) OR (drugs adj2 treatment) OR (drug adj2 therapies)).ti,ab	85156
11	MEDLINE	(medicines OR medication OR medicament OR medicaments OR medications).ti,ab	180623
12	MEDLINE	Pharmacotherapy.ti,ab	15780
13	MEDLINE	((adverse adj3 event) OR (adverse adj3 experience) OR (adverse adj3 experiences) OR (adverse adj3 effect) OR "side effect" OR "side effects" OR (adverse adj3 effects) OR (adverse adj3 events)).ti,ab	300409
14	MEDLINE	SUBSTANCE WITHDRAWAL SYNDROME/	18188
15	MEDLINE	"TOBACCO USE CESSATION"/ OR "TOBACCO USE DISORDER"/ OR TOBACCO, SMOKELESS/	9275
16	MEDLINE	SMOKING CESSATION/	17086
17	MEDLINE	SMOKING/	107311
18	MEDLINE	(tobacco OR cigar* OR "hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel).ti,ab	94406

No.		Database	Search term	Hits
19	☐	MEDLINE	(((smoking adj2 cessation) OR (stop smoking) OR (stopped smoking) OR (stopping smoking) OR (smoking adj3 quit) OR (smoking adj3 quitting) OR (smoking adj3 abstain) OR (smoking adj3 abstinence) OR (smoking adj3 withdrawal) OR (smoking adj3 reduction) OR (smoking adj3 restriction) OR (smoking adj3 restrict) OR (smoking adj3 reduce) OR (smoking adj3 abstaining) OR (smoking adj3 withdraw) OR "temporary abstinence")).ti,ab	20516
20	☐	MEDLINE	TOBACCO/	20769
21	☐	MEDLINE	15 OR 16 OR 17 OR 18 OR 19 OR 20	172181
22	☐	MEDLINE	(inpatient* OR outpatient*).ti,ab	134860
23	☐	MEDLINE	exp HOSPITALIZATION/	136755
24	☐	MEDLINE	exp OUTPATIENTS/	7185
25	☐	MEDLINE	exp INPATIENTS/	10316
26	☐	MEDLINE	"out-patient".ti,ab	7789
27	☐	MEDLINE	CHILD, HOSPITALIZED/ OR ADOLESCENT, HOSPITALIZED/	5777
28	☐	MEDLINE	(hospitalised OR hospitalized).ti,ab	59690
29	☐	MEDLINE	("in-patient" OR "in-patients" OR "out-patients").ti,ab	968878
30	☐	MEDLINE	((day adj2 patients) OR (day adj2 patient)).ti,ab	9231
31	☐	MEDLINE	"ill patients".ti,ab	20702
32	☐	MEDLINE	PATIENT ADMISSION/	16409
33	☐	MEDLINE	PREGNANT WOMEN/	4564
34	☐	MEDLINE	PREGNANCY/ OR PREGNANCY IN ADOLESCENCE/	647893
35	☐	MEDLINE	"acutely ill".ti,ab	2598
36	☐	MEDLINE	(primip* OR primigravid*).ti,ab	9636
37	☐	MEDLINE	22 OR 23 OR 24 OR 25 OR 26 OR 27 OR 28 OR 29 OR 30 OR 31 OR 32 OR 33 OR 34 OR 35 OR 36	1878735
38	☐	MEDLINE	"secondary care".ti,ab	2578
39	☐	MEDLINE	"secondary health".ti,ab	367
40	☐	MEDLINE	discharged.ti,ab	35970
41	☐	MEDLINE	(referred OR referral).ti,ab	147118
42	☐	MEDLINE	(emergency OR emergencies OR admitted OR admissions OR admission).ti,ab	319133

No.	Database	Search term	Hits
43	MEDLINE	exp HOSPITALS/	183727
44	MEDLINE	HOSPITAL UNITS/	8132
45	MEDLINE	exp HOSPITAL UNITS/	67581
46	MEDLINE	EMERGENCY MEDICAL SERVICES/	27979
47	MEDLINE	EMERGENCY SERVICES, PSYCHIATRIC/ OR exp EMERGENCY SERVICE, HOSPITAL/	42596
48	MEDLINE	exp OUTPATIENT CLINICS, HOSPITAL/	15023
49	MEDLINE	(re-admission OR readmission).ti,ab	6236
50	MEDLINE	discharge.ti,ab	98623
51	MEDLINE	exp MATERNAL HEALTH SERVICES/	28931
52	MEDLINE	OBSTETRICS/	14433
53	MEDLINE	OBSTETRICS AND GYNECOLOGY DEPARTMENT, HOSPITAL/	2242
54	MEDLINE	((rehabilitation OR psychiatric OR (day adj3 centres) OR (day adj3 centers) OR (day adj3 units) OR (day adj3 centre) OR (day adj3 center) OR (day adj3 unit) OR residential OR "long term care" OR "long-term care" OR psychiatric OR "mental health" OR "emergency services" OR "specialised care" OR "special care" OR "specialized care" OR readmitted OR "re-admitted")).ti,ab	294067
55	MEDLINE	((day adj2 care)).ti,ab	6110
56	MEDLINE	DAY CARE/	4484
57	MEDLINE	MENTAL HEALTH SERVICES/	22852
58	MEDLINE	((accident adj3 unit) OR (accident adj3 department) OR (emergency ADJ unit) OR (emergency ADJ department) OR (surgical ward) OR (surgical wards) OR (surgery adj2 unit) OR (surgery adj2 department) OR (surgery adj2 departments) OR (acute adj2 unit) OR (acute adj2 department) OR (acute adj2 units) OR (acute adj2 departments) OR (accident adj3 units) OR (accident adj3 departments) OR (emergency ADJ units) OR (emergency ADJ departments) OR (surgery adj2 units) OR "acute care" OR "secondary health service" OR "secondary health services" OR "acute health service" OR "acute health services" OR "acute setting" OR "acute settings").ti,ab	59804
59	MEDLINE	(postdischarge OR "post discharge" OR referrals OR inhospital).ti,ab	15821

No.		Database	Search term	Hits
60	☐	MEDLINE	(maternity OR "maternal health" OR obstetrics OR "prenatal care" OR "prenatal services" OR "antenatal care" OR "antenatal services" OR "obstetric care" OR "obstetric services" OR "perinatal care" OR "prenatal clinic" OR "prenatal clinics" OR "prenatal health" OR "prenatal service" OR "antenatal clinic" OR "antenatal clinics" OR "antenatal service" OR "antenatel health" OR "obstetric clinic" OR "obstetric clinics" OR "obstetric service" OR "obstetric health" OR "perinatal clinic" OR "perinatal clinics" OR "perinatal service" OR "perinatal services" OR "perinatal health" OR pregnancy OR "matenity healthcare" OR "obstetric healthcare" OR "prenatal healthcare" OR "antenatal healthcare" OR "perinatal healthcare" OR "maternal care" OR "maternal service" OR "maternal services").ti,ab	286096
62	☐	MEDLINE	((patient adj2 surgery) OR (patients adj2 surgery)).ti,ab	45407
63	☐	MEDLINE	(maternity OR "maternal health" OR obstetrics OR "prenatal care" OR "prenatal services" OR "antenatal care" OR "antenatal services" OR "obstetric care" OR "obstetric services" OR "perinatal care" OR "prenatal clinic" OR "prenatal clinics" OR "prenatal health" OR "prenatal service" OR "antenatal clinic" OR "antenatal clinics" OR "antenatal service" OR "antenatal health" OR "obstetric clinic" OR "obstetric clinics" OR "obstetric service" OR "obstetric health" OR "perinatal clinic" OR "perinatal clinics" OR "perinatal service" OR "perinatal services" OR "perinatal health" OR pregnancy OR "obstetric healthcare" OR "prenatal healthcare" OR "antenatal healthcare" OR "perinatal healthcare" OR "maternal care" OR "maternal service" OR "maternal services" OR "obstetric services").ti,ab	286115
65	☐	MEDLINE	38 OR 39 OR 40 OR 41 OR 42 OR 43 OR 44 OR 45 OR 46 OR 47 OR 48 OR 49 OR 50 OR 51 OR 52 OR 53 OR 54 OR 55 OR 56 OR 57 OR 58 OR 59 OR 60 OR 63	1337813
66	☐	MEDLINE	(hospital OR hospitals).af	2522490
67	☐	MEDLINE	65 OR 66	3278615
68	☐	MEDLINE	(smoker* OR (tobacco adj3 user) OR (tobacco adj3 users) OR (cigar* adj3 user) OR (cigar* adj3 users)).ti,ab	51690
69	☐	MEDLINE	(patient OR patients).ti,ab	3967960
70	☐	MEDLINE	PATIENTS/	14572

No.	Database	Search term	Hits
71	MEDLINE	69 OR 70	3973162
72	MEDLINE	67 AND 71	1441140
73	MEDLINE	67 AND 68	13617
74	MEDLINE	72 OR 73	1448071
75	MEDLINE	ANIMALS/ AND HUMANS/	1321543
76	MEDLINE	ANIMALS/	4951979
77	MEDLINE	pharmacol*.ti,ab	211996
78	MEDLINE	((favourabl* adj3 effect*)).ti,ab	3315
79	MEDLINE	((favorabl* adj3 effect*)).ti,ab	5700
80	MEDLINE	((favorabl* adj3 event*) OR (favourabl* adj3 event*) OR (favorabl* adj3 experience) OR (favourabl* adj3 experiences)).ti,ab	675
81	MEDLINE	((adverse adj2 reaction) OR (adverse adj2 reactions) OR (adversely adj2 react)).ti,ab	27801
82	MEDLINE	((drug adj3 interact*) OR (drugs adj3 interact*)).ti,ab	24996
83	MEDLINE	patient.ti OR patients.ti	1102082
84	MEDLINE	(dosage OR dose OR doses).ti,ab	968019
85	MEDLINE	(reaction* OR inhibit OR inhibitor* OR inhibits OR impair* OR interact*).ti,ab	2720463
86	MEDLINE	(adversely adj2 react*).ti,ab	93
88	MEDLINE	((patient adj9 nicotine) OR (patients adj9 nicotine)).ti,ab	943
90	MEDLINE	(drug ADJ therap*).ti,ab	28553
91	MEDLINE	4 OR 6 OR 8 OR 9 OR 10 OR 11 OR 12 OR 84 OR 90	2119326
92	MEDLINE	7 OR 14 OR 82	164213
93	MEDLINE	((undesirabl* ADJ effect) OR (undesirabl* ADJ effects)).ti,ab	1769
94	MEDLINE	5 OR 13 OR 77 OR 78 OR 79 OR 80 OR 81 OR 85 OR 86 OR 93	3120930
95	MEDLINE	91 AND 94	598459
96	MEDLINE	92 OR 95	717858
97	MEDLINE	3 AND 96	5852
98	MEDLINE	76 NOT 75	3630436
99	MEDLINE	97 NOT 98	3113
103	MEDLINE	64 OR 83	2527076

No.	Database	Search term	Hits
106	MEDLINE	21 AND 72 AND 96	819
107	MEDLINE	73 AND 96	829
109	MEDLINE	102 OR 105 OR 106 OR 107 [Limit to: Publication Year 1990-Current]	2572
111	MEDLINE	((64 OR 73 OR 72 OR 83) AND 3)	4626
112	MEDLINE	111 OR 88	4932
113	MEDLINE	112 NOT 98	4272
114	MEDLINE	(((pregnant adj3 women) OR (pregnant adj3 mothers) OR (pregnant adj3 adolescents))).ti,ab	54166
115	MEDLINE	5 OR 7 OR 14 OR 77 OR 82	393883
116	MEDLINE	95 OR 115	876108
117	MEDLINE	3 AND 116	7383
118	MEDLINE	117 NOT 98	4016
120	MEDLINE	118 [Limit to: Publication Year 1980-Current]	3686
121	MEDLINE	99 [Limit to: Publication Year 1980-Current]	2973
122	MEDLINE	120 NOT 121 [Limit to: Publication Year 1980-Current]	713
123	MEDLINE	37 OR 62 OR 114 OR 83	2517618
124	MEDLINE	21 AND 123	26496
125	MEDLINE	21 AND 72	13492
126	MEDLINE	73 OR 102 OR 124 OR 125 [Limit to: Publication Year 1990-Current]	35131
127	MEDLINE	126 AND 116 [Limit to: Publication Year 1990-Current]	2951
128	MEDLINE	127 NOT 98 [Limit to: Publication Year 1990-Current]	2878
129	MEDLINE	(123 OR 72 OR 73)	3257143
130	MEDLINE	3 AND 129	4593
131	MEDLINE	88 OR 130	4899
132	MEDLINE	131 NOT 98	4254
133	MEDLINE	132 [Limit to: Publication Year 1980-Current]	4118
138	MEDLINE	((patients adj9 cigar*) OR (patients adj9 tobacco*) OR (patients adj9 smok*) OR (patient adj9 cigar*) OR (patient adj9 tobacco*) OR (patient adj9 smok*)).ti,ab	18988
139	MEDLINE	124 OR 125 OR 73 OR 138	49579
140	MEDLINE	139 AND 118	816

No.	Database	Search term	Hits
141	MEDLINE	139 AND 116	3337
142	MEDLINE	141 NOT 98	3257
143	MEDLINE	142 [Limit to: Publication Year 1980-Current]	3214
144	MEDLINE	120 OR 133 [Limit to: Publication Year 1980-Current]	6886

Appendix 2: Audit information that will accompany each database and website search

Database name	
Search date	
Database host *(name of host or environment in which the database was searched)*	
Coverage dates	
Name of searcher	
Search strategy checked by	
Number of records retrieved	
Name of EndNote library	
Number of records loaded into EndNote library	
Reference numbers of records in EndNote library *(range of unique reference numbers assigned to the records by EndNote)*	
Number of records after deduplication in EndNote library	

Appendix 3: Title/Abstract Screening Checklist

1	Does the paper report on effects (adverse or favourable) of nicotine replacement therapy OR the effects (adverse or favourable) of abstinence from tobacco?*	Yes – go to next question	No – exclude
2	Does the paper address /include the relevant population?*	Yes – go to next question	No – exclude
3	Include in full text screening?	Yes	

*Where the assessor is unsure about a paper then the abstract will be discussed among all reviewers and a final decision made.

Appendix 4: Quality appraisal checklist for quantitative studies

Study identification:		
Study design:		
Assessed by:		
Section 1: Population		
• Is the source population or source area well described? • Was the country (e.g. developed or nondeveloped, type of health care system), setting (primary schools, community centres etc.), location (urban, rural), population demographics etc. adequately described?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	Comments:
• Is the eligible population or area representative of the source population or area? • Was the recruitment of individuals/clusters/areas well defined (e.g. advertisement, birth register)? • Was the eligible population representative of the source? Were important	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
☐ Do the selected participants or areas represent the eligible population or area? ☐ Was the method of selection of participants from the eligible population well described? ☐ What % of selected individuals/clusters agreed to participate? Were there any sources of bias? ☐ Were the in-/exclusion criteria explicit and appropriate?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
Section 2: Method of Allocation to intervention (or comparison)		
• Allocation to intervention (or comparison). • How was selection bias minimised? • Was allocation to exposure and comparison randomised? • Was it truly random ++ or pseudo-randomised + (e.g. consecutive admissions)? • If not randomised, was significant confounding likely (-) or not (+)? • If a cross-over, was order of intervention randomised?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Were interventions (and comparisons) well described and appropriate? • Were intervention/s & comparison/s described in sufficient detail (i.e. enough for study to be replicated)? • Was comparison/s appropriate (e.g. usual practice rather than no intervention)?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Was the allocation concealed? • Could the person(s) determining allocation of participants/clusters to intervention or comparison groups have influenced the allocation? • Adequate allocation concealment (++) would include centralised allocation or computerised allocation systems.	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Were participants and/or investigators blind to exposure and comparison? • Were participants AND investigators – those delivering and/or assessing the intervention kept blind to intervention allocation?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	

• Was the exposure to the intervention and comparison adequate? • Is reduced exposure to intervention or control related to the intervention (e.g. adverse effects leading to reduced compliance) or fidelity of implementation (e.g. reduced adherence to protocol)? • Was lack of exposure sufficient to cause important bias?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Was contamination acceptably low? • Did any in the comparison group receive the intervention or vice versa? • If so, was it sufficient to cause important bias? • If a cross-over trial, was there a sufficient wash-out period between interventions?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Were other interventions similar in both groups? • Did either group receive additional interventions or have services provided in a different manner? • Were the groups treated equally by researchers or other professionals? • Was this sufficient to cause important bias?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Were all participants accounted for at study conclusion? • Were those lost-to-follow-up (i.e. dropped or lost pre-/during/post-intervention) acceptably low (i.e. typically <20%)? • Did the proportion dropped differ by group? For example, were drop-outs related to the adverse effects of the intervention?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Did the setting reflect usual UK practice? • Did the setting in which the intervention or comparison was delivered differ significantly from usual practice in the UK? • For example, did participants receive intervention (or comparison) condition in a hospital rather than a community-based setting?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Did the intervention or control comparison reflect usual UK practice? • Did the intervention or comparison differ significantly from usual practice in the UK? • For example, did participants receive intervention (or comparison) delivered by specialists rather than GPs? Were participants monitored more closely?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
Section 3: Outcomes		
• Were outcome measures reliable? • Were outcome measures subjective or objective (e.g. biochemically validated nicotine levels ++ vs self-reported smoking -). • How reliable were outcome measures (e.g. inter- or intra-rater reliability scores)? • Was there any indication that measures had been validated (e.g. validated against a gold standard measure or assessed for content validity)	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Were all outcome measurements complete? • Were all/most study participants who met the defined study outcome definitions likely to have been identified?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Were all important outcomes assessed? • Were all important benefits and harms assessed? Was it possible to determine the overall balance of benefits and harms of the intervention versus comparison?	☐ ++ ☐ + ☐ - ☐ NR	

	☐ NA	
• Were outcomes relevant? • Where surrogate outcome measures were used, did they measure what they set out to measure?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Were there similar follow-up times in exposure and comparison groups?	☐ ++ ☐ + ☐ - ☐ NR NA	
• Was follow-up time meaningful? • Was follow-up long enough to assess longterm benefits/harms? • Was it too long, e.g. participants lost to follow-up?	☐ ++ ☐ + ☐ - ☐ NR NA	
Section 4: Analyses		
• Were exposure and comparison groups similar at baseline? If not, were these adjusted? • Were there any differences between groups in important confounders at baseline? • If so, were these adjusted for in the analyses (e.g. multivariate analyses or stratification). • Were there likely to be any residual differences of relevance?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Was Intention to treat (ITT) analysis conducted? • Were all participants (including those that dropped out or did not fully complete the intervention course) analysed in the groups (i.e. intervention or comparison) to which they were originally allocated?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Was the study sufficiently powered to detect an intervention effect (if one exists)? • Is a power calculation presented? If not, what is the expected effect size? Is the sample size adequate?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Were the estimates of effect size given or calculable? • Were effect estimates (e.g. relative risks, absolute risks) given or possible to calculate?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Were the analytical methods appropriate? • Were important differences in follow-up time and likely confounders adjusted for? • If a cluster design, were analyses of sample size (and power), and effect size performed on clusters (and not individuals)? • Were subgroup analyses pre-specified?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Was the precision of intervention effects given or calculable? Were they meaningful? • Were confidence intervals and/or p-values for effect estimates given or possible to calculate? • Were CI's wide or were they sufficiently precise to aid decision-making? • If precision is lacking, is this because the study is under-powered?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	

Section 5: Summary		
• Are the study results internally valid (i.e. unbiased)? • How well did the study minimise sources of bias (i.e. adjusting for potential confounders)? • Were there significant flaws in the study design?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Are the findings generalisable to the source population (i.e. externally valid)? • Are there sufficient details given about the study to determine if the findings are generalisable to the source population? • Consider: participants, interventions and comparisons, outcomes,	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
Overall assessment	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	

Appendix 5: Quality appraisal checklist for qualitative studies

Study identification		
Checklist completed by:		
Theoretical approach		
• Is a qualitative approach • appropriate?	☐ Appropriate ☐ Inappropriate ☐ Not sure	Comments:
• Is the study clear in what it seeks to do?	☐ Clear ☐ Unclear ☐ Mixed	
Study Design		
• How defensible/rigorous is the research design/methodology?	☐ Defensible ☐ Indefensible ☐ Not sure	
Data collection		
• How well was the data collection carried out?	☐ Appropriately ☐ Inappropriately ☐ Not sure/ inadequately reported	
Trustworthiness		
• Is the role of the researcher clearly described? • Does the paper describe how the research was explained and presented to the participants?	☐ Clearly described ☐ Unclear ☐ Not described	
• Is the context clearly described? • Were observations made in a sufficient variety of circumstances? • Was context bias considered	☐ Clear ☐ Unclear ☐ Not sure	
• Were the methods reliable? • Do the methods investigate what they claim to?	☐ Reliable ☐ Unreliable ☐ Not sure	
Analysis		
• Is the data analysis sufficiently rigorous? • How systematic is the analysis, is the • procedure reliable/dependable? • Is it clear how the themes and concepts • were derived from the data?	☐ Rigorous ☐ Not rigorous ☐ Not sure/ not reported	
• Is the data 'rich'?	☐ Rich ☐ Poor ☐ Not sure/ not reported	
• Is the analysis reliable?	☐ Reliable ☐ Unreliable ☐ Not sure/ not reported	

• Are the findings convincing?	☐ Convincing ☐ Not ☐ Convincing ☐ Not sure	
• Are the findings relevant to the aims of the study?	☐ Relevant ☐ Irrelevant ☐ Partially ☐ Relevant	
Conclusions		
• Does this enhance understanding of the research topic? • Are the implications of the research clearly defined? • Is there adequate discussion of any limitations encountered?	☐ Adequate ☐ Inadequate ☐ Not sure	
Ethics		
• How clear and coherent is the reporting of ethics? • Was the study approved	☐ Appropriate ☐ Inappropriate ☐ Not sure/ not reported	
Overall Assessment		
As far as can be ascertained from the paper, how well was the study conducted?	☐ ++ ☐ + ☐ -	

Appendix 6: Review screening form

Study identification	
Checklist completed by**:**	
In a well-conducted systematic review:	In this review this criterion is met: (Circle one option for each question)
Does the review address an appropriate and clearly-focused question that is relevant to one or more of the guidance topic's key research question/s?	Yes No Unclear
Does the review include the types of study/s relevant to the key research question/s?	Yes No Unclear
Is the literature search sufficiently rigorous to identify all the relevant studies?	Yes No Unclear
Is the study quality of included studies appropriately assessed and reported?	Yes No Unclear
Is an adequate description of the analytical methodology used included, and are the methods used appropriate to the question?	Yes No Unclear
Overall Quality	Comments

Appendix 7: Data extraction form/Evidence Table for Quantitative studies

Study details	**Population and setting**	**Method of allocation to intervention/control**	**Outcomes and methods of analysis**	**Results**	**Notes**
Authors	Source populations	Method of allocation	Primary outcome	Primary outcome	Limitations identified by author
Year		Intervention description	Secondary outcomes	Secondary outcomes	Limitations identified by review team
Citation					
Aim of Study	Eligible population	Control/comparison			
Study design		Sample size	Follow-up periods	Attrition details	Evidence gaps
Quality score	Selected population	Any baseline differences?			
External validity		Study sufficient powered?	Method of analysis		Source of funding

Appendix 8: Data extraction form/Evidence Table for Qualitative studies

Authors	What was the research question?	What population were the sample recruited from:	Brief description of method and process of analysis:	Limitations identified by author
Year		How were they recruited:		
Citation	What theoretical approach does the study take (if specified):	How many participants were recruited:	Key themes relevant to this review:	Limitations identified by review team
	How were the data collected:	Were there specific exclusion criteria		Evidence gaps
Quality score		Were there specific inclusion criteria:		Source of funding

APPENDIX 2 – EXCLUDED PAPERS

Table 18: Full text papers relevant to chapter 1 that were excluded

Paper (n=55)	Reason
Afessa et al (2010)	Editorial on Lucidarme
Armstrong et al (2011)	Did not report on the effects of changes in nicotine or tobacco
Baron (1996)	Did not report on the effects of changes in nicotine or tobacco
Bernstein et al (2011)	Did not report on the effects of changes in nicotine or tobacco
Bize et al (2006)	Did not report on the effects of changes in nicotine or tobacco
Bock et al (2008)	Did not report on the effects of changes in nicotine or tobacco
Borowitz et al (2008)	Did not report on the effects of changes in nicotine or tobacco
Braganza 2008	Did not report on the effects of changes in nicotine or tobacco
Browman et al (2008)	Reported on outcomes of radiotherapy in smokers vs. non-smokers. Not clear if related to changes in nicotine or tobacco
Campbell et al (1996)	Did not report on the effects of changes in nicotine or tobacco
Chen et al (2010)	Did not report on the effects of changes in nicotine or tobacco
Cropley et al (2008)	Did not report on the effects of changes in nicotine or tobacco
Eissenberg et al (2010)	Did not report on the effects of changes in nicotine or tobacco
Emmons et al (2000)	Did not report on the effects of changes in nicotine or tobacco
Feeney et al (2001)	Did not report on the effects of changes in nicotine or tobacco
Fiore et al (2000)	Did not report on the effects of changes in nicotine or tobacco
Freund et al (2009)	Did not report on the effects of changes in nicotine or tobacco
Gadomski et al (2010)	Did not report on the effects of changes in nicotine or tobacco
Gadomski et al. (2011)	Did not report on the effects of changes in nicotine or tobacco
Gothe et al (1985)	Did not report on the effects of changes in nicotine or tobacco
Gourlay (1994)	Did not report on the effects of changes in nicotine or tobacco
Gratziou (2009)	Did not report on the effects of changes in nicotine or tobacco
Hall (2007)	Did not report on the effects of changes in nicotine or tobacco
Hand et al (2002)	Did not report on the effects of changes in nicotine or tobacco
Hawkshaw et al (2005)	Did not report on the effects of changes in nicotine or tobacco
Hayes et al (2010)	Did not report on the effects of changes in nicotine or tobacco
Hays (2000)	Did not report on the effects of changes in nicotine or tobacco
Hunsballe et al (2001)	Population was not relevant (non smoking teenagers and adults with enuresis)
John et al (2009)	Did not report on the effects of changes in nicotine or tobacco
Labbate et al (1992)	Did not report on the effects of changes in nicotine or tobacco
McKee et al (2003)	Did not report on the effects of changes in nicotine or tobacco
Molyneux (2004)	Did not report on the effects of changes in nicotine or tobacco
Molyneux et al (2001)	Covered in molyneux 2003
Munafo et al (2001)	Did not report on the effects of changes in nicotine or tobacco
Ohare (1993)	Did not report on the effects of changes in nicotine or tobacco
Padula & Willey (1993)	Reports on tobacco withdrawal in 17 smokers in CCU, but no usable data.
Pbert (2006)	Did not report on the effects of changes in nicotine or tobacco
Pine & Hatterer (1994)	Did not report on the effects of changes in nicotine or tobacco
Quist-Paulsen et al (2005)	Did not report on the effects of changes in nicotine or tobacco
Reid et al (2003)	Did not report on the effects of changes in nicotine or tobacco
Reid et al (2010)	Did not report on the effects of changes in nicotine or tobacco
Reid et al (2011)	Did not report on the effects of changes in nicotine or tobacco
Rigotti et al (1999)	Did not report on the effects of changes in nicotine or tobacco
Rigotti et al (2006)	Did not report on the effects of changes in nicotine or tobacco
Rigotti et al (2007)	Did not report on the effects of changes in nicotine or tobacco
Rigotti et al (2008)	Did not report on the effects of changes in nicotine or tobacco
Rigotti et al (2009)	Did not report on the effects of changes in nicotine or tobacco

Simon et al (2003)	Did not report on the effects of changes in nicotine or tobacco
Stead & Lancaster (2005)	Did not report on the effects of changes in nicotine or tobacco
Strassmann et al (2009)	Did not report on the effects of changes in nicotine or tobacco
Unkle et al (2011)	Editorial on Cartin Ceba (2011)
Van der Klauw et al (1996)	Reports on a case study of vasculitis in a patch user
Weiss (1996)	Discusses symptoms of nicotine overdose only
Wiggers et al (2003)	Did not report on the effects of changes in nicotine or tobacco
Wolfenden et al (2008)	Did not report on the effects of changes in nicotine or tobacco

Table 19: Full text papers relevant to chapter 2 that were excluded

Paper (n=55)	Reason
Anonymous (2007)	No data regarding the effects of changes in nicotine
Anonymous (1996)	No data regarding the effects of changes in nicotine
Anonymous (2011)	No data regarding the effects of changes in nicotine
Banham et al (2008)	No data regarding the effects of changes in nicotine
Bersani et al (2011)	General review on clozapine, reports on Meyer (2001)
Brown et al (2003)	No data regarding the effects of changes in nicotine
Campion et al (2008b)	General review on smoking cessation only
Connors et al (1996)	Not population of interest
Dalack et al (1997)	No data regarding the effects of changes in nicotine
Dalack and Meador-Woodruff (1999)	No data regarding the effects of changes in nicotine
Dingman et al (1988)	Paper could not be obtained in time and has no abstract
El-Guebaly et al (2002)	Review of smoking cessation approaches only
Elkader et al. (2009)	No data regarding the effects of changes in nicotine
Elliott (2009).	No data regarding the effects of changes in nicotine
Els (2004)	No data regarding the effects of changes in nicotine
Etter et al (2008)	No data regarding the effects of changes in nicotine
Fagerstrom and Aubin (2009).	No data regarding the effects of changes in nicotine
Garti et al (2002)	No extractable data
Gehricke et al (2009)	Not population of interest
Gralnick (1988)	No data regarding the effects of changes in nicotine
Greenwood-Smith et al (2003)	No data regarding the effects of changes in nicotine
Hall et al (1993)	No data regarding the effects of changes in nicotine
Hall et al (1996)	No data regarding the effects of changes in nicotine
Hall et al (2006)	No data regarding the effects of changes in nicotine
Hartman et al (1991)	Reports on smoking cessation outcome only
Hayes et al (2010)	No data regarding the effects of changes in nicotine
Hughes (1987)	No data regarding the effects of changes in nicotine
Jochelson & Majrowski (2006)	No data regarding the effects of changes in nicotine
Julyan (2006)	No data regarding the effects of changes in nicotine
Kalman et al (2001)	No extractable data
Kalman et al (2011)	No data regarding the effects of changes in nicotine
Karam-Hage et al (2011)	No data regarding the effects of changes in nicotine
Keizer et al (2009)	No data regarding the effects of changes in nicotine
Kisely & Campbell (2008)	No data regarding the effects of changes in nicotine
Knadler et al (2011)	No data regarding the effects of changes in nicotine
Kroger et al (2005)	No data regarding the effects of changes in nicotine
Kumari & Postma (2005)	No data regarding the effects of changes in nicotine
Lawn & Pols (2003)	No data regarding the effects of changes in nicotine
Levin and Rezvani (2007)	No data regarding the effects of changes in nicotine
Levin et al. (1996)	No data regarding the effects of changes in nicotine
Matthews et al (2011)	No data regarding the effects of changes in nicotine

Nursing Standard (2009)	Editorial only
Prochaska et al (2004)	No data regarding the effects of changes in nicotine
Prochaska et al (2006)	Reports only on smoking cessation outcomes
Prochaska et al (2009)	No data regarding the effects of changes in nicotine
Punnoose & Belgamwar (2009)	No data regarding the effects of changes in nicotine
Saxon et al (1997)	No data regarding the effects of changes in nicotine
Scharf et al (2011)	Reposts on patterns of NRT prescribing only
Schwenger et al (2011)	No data regarding the effects of changes in nicotine
Strong et al (2004)	No data regarding the effects of changes in nicotine
Taylor et al (1993)	Reports on attitudes to a smoking ban only
Tidey et al (2008)	No data regarding the effects of changes in nicotine
Van Dongen et al (1999)	No data regarding the effects of changes in nicotine
Williams & Hughes (2003)	No data regarding the effects of changes in nicotine
Yeh and Lee (2009)	No data regarding the effects of changes in nicotine

Table 20: Full text papers relevant to chapter 3 that were excluded

Paper (n=15)	**Reason**
ACOG (2005)	Superseded by ACOG (2010)
Andersen and Olsen (2011)	Summarises Strandberg-Larsen (2008) and Lassen (2010)
Atkinson (2003)	Abstract of Hotham
Cesta et al (2008)	Presents animal data
Coleman (2005)	Opinion paper, information covered in Coleman 2008
Coleman et al (2007)	No relevant information on effects of changes in nicotine
DiTommaso (2002)	No relevant information on effects of changes in nicotine
Dwyer et al (2008)	Data from animal studies presented
Einarson and Riordan (2009)	No relevant information on effects of changes in nicotine
Fish et al (2009)	Covers data relating to adherence to NRT treatment provided in Pollack 2007
Koren (2002)	No relevant information on effects of changes in nicotine
Low (1997)	No relevant information on effects of changes in nicotine
Ogburn et al (2001)	Abstract containing data covered in Ogburn 1999 and Schroeder 2002
Oncken et al (2006)	Abstract only with no useable data
Rigotti et al (2008)	No relevant information on effects of changes in nicotine

Smoking cessation in Secondary Care

Review 2 (Component 1)

Smoking cessation interventions in acute and maternity services: Review of effectiveness

Report to National Institute for Health and Clinical Excellence

Final Draft

15 August 2012

Katie Myers, Hayden McRobbie and Peter Hajek

November 2021: NICE guidelines PH45 (June 2013) and PH48 (November 2013) have been updated and replaced by NG209. The recommendations labelled [2013] or [2013, amended 2021] in the updated guideline were based on these evidence reviews. See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

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GLOSSARY

Abstinence	Throughout this review we refer to abstinence from smoking as abstinence. Rates of abstinence are also presented. See point prevalence abstinence, continuous abstinence, sustained abstinence and CO-validated abstinence.
Biochemically validated	Self-reported abstinence rates are often validated, or confirmed, by biochemical tests. These tests include measurement of CO in expired breath and cotinine in saliva, blood, and urine.
Bupropion	Bupropion or Zyban ™ is an atypical antidepressant that is also effective in helping people to stop smoking. In the UK it is only licensed as a smoking cessation aid
CO-validated abstinence	Measurement of carbon monoxide in expired breath is commonly used to validate self-reported abstinence. A cut-off of 10 ppm is routinely used, so if someone reports they have not smoked and have a CO reading of less than 10ppm then they would be considered to be a CO-validated abstainer.
Continuous abstinence	This measures continuous abstinence from smoking, either not a single puff or a small number of slips allowed (e.g. less than 5 cigarettes in total), from a pre-determined time point (e.g. Quit Date) to all follow-up points. Continuous abstinence rates are typically lower than point prevalemce abstinence rates, but more likely to give a more accurate assessment of the effect of an intervention.
Nicotine replacement therapy	Nicotine replacement therapy is a licensed medicinal product to aid smoking cessation, smoking reduction and temporary abstinence. There are seven different formats: patch, gum, lozenge, sublingual tablet, nasal spray, mouth spray and inhalator.
Point prevalence abstinence	This measures abstinence from smoking at a particular time. 7-day point prevalence (i.e. not smoking at all over the past 7 days) is a commonly used measure.
Varenicline	Varenicline or Champix ™ is a nicotine analogue that was developed specifically to help people stop smoking. It acts primarily to reduce the severity of tobacco withdrawal symptoms thus making quitting easier.

LIST OF ABBREVIATIONS

CABG/S	Coronary Artery Bypass Graft/Surgery
CAD	Coronary Artery Disease
CBT	Cognitive Behavioural Therapy
CCU	Coronary Care Unit
CHD	Coronary Heart Disease
CHF	Congestive Heart Failure
CI	Confidence Interval
CO	Carbon Monoxide
COHb	Carboxyhaemoglobin
COPD	Chronic Obstructive Pulmonary Disease
CVD	Cardiovascular Disease
EDD	Estimated date of delivery
FTND	Fagerstrom Test for Nicotine Dependence
FU	Follow-up
HV	Health Visitor
ICU	Intensive Care Unit
ITT	Intention to treat
MI	Myocardial Infarction
MW	Midwife
NRT	Nicotine Replacement Therapy
OR	Odds Ratio
PP	Point Prevalence
PVD	Peripheral Vascular Disease
RCT	Randomised Controlled Trial
RR	Relative Risk
SC	Smoking cessation
SOC	Stage of Change

TQD	Target Quit Date
TTM	Transtheoretical Model

Executive Summary

INTRODUCTION

Each year thousands of UK smokers are admitted to acute care for treatment of smoking related diseases. Hospitalisation provides a good opportunity to stop smoking. Such patients are often highly motivated to quit, UK hospitals are smoke-free environments with no cues for smoking, and the hospital admission brings smokers into contact with healthcare professionals who can advise on giving up smoking and offer evidence-based treatment.

Pregnancy is another opportune moment for stopping smoking. Most women in the UK know that smoking in pregnancy is discouraged and many are aware of some of the risks it can pose to their unborn child. Midwives and other primary care workers provide encouragement and advice and most stop-smoking services offer specialist help.

This documents reviews the available evidence concerning efficacy of different types of smoking cessation interventions with hospital patients and their relatives and with pregnant women and their partners to help guide relevant clinical recommendations.

RESEARCH QUESTIONS

This review aims to answer the following two questions posed by NICE:

Question 1: How effective are smoking cessation interventions in helping people from the populations of interest?

Question 2: How effective are interventions for temporary abstinence in helping people from the populations of interest?

STRUCTURE OF THE REVIEW

The review is divided into two chapters that address the two populations of interest: (1) users of acute secondary care services and staff and visitors of these services, and (2) users of maternity services and their partners.

METHODOLOGY

TYPES OF STUDIES CONSIDERED IN THIS REVIEW

We included all randomised controlled trials of smoking cessation interventions with the populations of interest as well as trials with patients' relatives and with staff.

CATEGORISING INTERVENTIONS BY INTENSITY

A number of different types of behavioural interventions have been proposed to help smokers quit. They can be categorised according to their theoretical underpinning, use of treatment aids such as booklets, videos and biological feedback, background of the person delivering the intervention, etc. We used the approach of the Cochrane review of

interventions with hospital patients (Rigotti et al. 2007 [Systematic review, ++]) and categorised the interventions according to the length of time over which support was provided. Length of support is generally related to the cost of the intervention and also to its efficacy. Such approach seems practical for informing clinical recommendations.

The studies have been categorised into the following levels of intensity:

Intensity 1: Single contact with or without take-away written and other materials, no follow-up support.

Intensity 2: One or more contacts with or without take-away written and other materials up to but not beyond the target quit date (TQD)

Intensity 3: Any contact plus follow-up for up to but not beyond 4 weeks after TQD

Intensity 4: Any contact plus telephone/correspondence/e-mail etc. based follow-up for > 1 month

Intensity 5: Any contact plus follow-up for > 1 month including at least one face-to-face contact

We also considered whether the interventions work when they are and when they are not accompanied by pharmacological treatments.

Issues not covered in this review

We excluded trials with psychiatric patients and did not consider evidence relating to the health benefits of stopping smoking.

Outcomes and data extraction

For trials concerning secondary care, the principal outcome measure was abstinence from smoking at least six months after the start of the intervention. For trials concerning users of maternity services, the principal outcome measure was abstinence from smoking at the longest follow-up period up to and including delivery; and separately abstinence from smoking at the longest follow-up after delivery.

We extracted the most conservative measure of quitting at the longest follow up. Participants lost to follow up were counted as continuing smokers.

Evaluation of trial quality

Each of the included studies was rated ++, + or - to indicate its quality, as follows.

++	Self-reported abstinence was verified biochemically, sustained or continuous abstinence reported, no other risks of bias
+	Self-reported abstinence was verified biochemically, only point prevalence abstinence reported, no major risks of bias
–	Self-reported abstinence not validated and/or other major risks of bias (e.g. incomplete randomization, unclear N, unclear calculation of success rates)

DATA ANALYSIS

Where it was appropriate to pool studies, data were entered into RevMan 5. We pooled data using Mantel-Haenszel fixed-effect method, with 95% confidence intervals. To investigate statistical heterogeneity we used the I^2 statistic. Where there was substantial heterogeneity between studies we explored possible reasons for this using subgroup analyses. We express results as odds ratios (intervention odds/control odds) for achieving abstinence from smoking together with the 95% confidence interval for this estimate.

EVIDENCE STATEMENTS

Scoring the strength of evidence was based on the quality of the individual studies, the number of studies included in the meta-analysis, and the results of the meta-analysis.

The strength of evidence was classified as:

- No evidence
- Weak evidence: None of the included studies score [+] for quality and/or the result of the meta-analysis is only marginally significant
- Moderate evidence: One or more studies score [+] or [++] for quality and the result of the meta-analysis is significant, but most studies are of low quality and/or less than 3 studies are included and/or the results of the meta-analysis are heterogeneous
- Strong evidence: One or more studies score [+] and [++] for quality, the result of the meta-analysis is significant and homogenous, and there are more than two studies included in the meta-analysis

SEARCH METHODOLOGY

We systematically searched reviews and trials published between 1990 and December 2011 in the English language, but we also included literature published in early 2012 while we were working on the review. The searchable databases included ASSIA, MEDLINE, Cochrane Central Register of Controlled Trials, CINAHL and PsychINFO (a full list of the databases searched is included in the review protocol in Appendix 1). Several websites were also searched for relevant data these included NHS Centre for Smoking Cessation and Treatment, Action on Smoking and Health (ASH), Treat tobacco.net and WHO Tobacco Free Initiative (a full list of websites searched is included in Appendix 1). A systematic search of the grey literature was not undertaken but hand searching of bibliographies of systematic reviews that met the inclusion criteria was carried out to ensure that relevant data was included in this review. The search terms included for this review are also in the review protocol in Appendix 1).

SEARCH RESULTS

Searches of the databases returned 29,083 records. A total of 284 papers were identified for full text retrieval. A flow diagram illustrating the screening procedure is included in figure 1. Studies excluded are listed in the appendix 2, along with a brief reason for exclusion.

Chapter 1: Smoking Cessation Interventions in Acute Care Services

We found 75 trials evaluating smoking cessation interventions delivered in acute care settings that had follow-up periods of at least 6 months. The chapter is divided into five sections.

SECTION 1: EFFICACY OF INTERVENTIONS DELIVERED TO NON-SURGERY PATIENTS

SUBSECTION 1: INTERVENTION INTENSITY

We analysed first all available studies, and followed this by an analysis of only those which validated self-reported abstinence biochemically and were least vulnerable to bias.

Analysis of all available studies:

Intensity 1:
Three studies (Brandt et al 1997 [RCT +]; Hennrikus, et al 2005 [RCT +]; Papadakis et al 2011 [RCT +]) reported on the effects of one-off brief interventions (Intensity 1 and 2) with no follow-up. The results were homogenous and show no additional effect of such interventions compared to usual care (OR=1.26; 95% CI:0.89-1.78).

Intensity 2:
The results from six studies (Chouinard et al 2005 [RCT ++]; Hajek et al 2002 [RCT ++]; Molyneux et al 2003 [RCT ++]; Nagle et al 2005 [RCT +]; Pederson et al 1991 [RCT +]; Pelletier et al 1998 [RCT -]) which reported slightly more intensive interventions in hospital (a longer counselling session or two and booklets) with no further follow up were similar, showing no effect of such interventions (OR=1.04; 95%CI: 0.83-1.31). The results were again homogenous.

Intensity 3: Ten studies (Kim et al 2005 [RCT +]; Miller et al 1997 [RCT +]; Neuner et al 2009 [RCT -]; Ortigosa et al 2000 [RCT +]; Rigotti et al 1994 [RCT ++]; Rigotti et al 1997 [RCT +]; Schiebel et al 2007 [RCT -]; Stevens et al 1993 [RCT -]; Stevens et al 2000 [RCT -]; Wiggers et al 2006 [RCT +]) provided telephone support post-discharge for up to 4 weeks. This generated a marginally significant effect overall (OR=1.17; 95% CI: 1.01-1.36), but there was no effect when only studies which validated self-reported abstinence were included (see below). The studies were homogenous.

Intensity 4: There were 26 trials (British Thoracic Society B 1990 [RCT ++]; Chouinard et al 2005 [RCT ++]; De Busk et al 1994 [RCT ++]; Dornelas et al 2000 [RCT +]; Feeney et al 2001 [RCT ++]; Froelicher et al 2004 [RCT +]; Hasuo et al 2004 [RCT +]; Haug et al 2011 [RCT -]; Hennrikus et al 2005 [RCT +]; Horn et al 2008 [RCT -]; Lacasse et al 2008 [RCT -]; Li et al 2008 [RCT -]; Metz et al 2007 [RCT -]; Miller et al 1997 [RCT +]; Mosca et al 2010 [RCT +]; Quist-Paulsen et al 2003 [RCT +]; Reid et al 2003 [RCT +]; Reid et al 2007 [RCT -]; Rosal et al 1992 [RCT ++]; Simon et al 2003 [RCT +]; Sivarajan et al 2004 [RCT -]; Smith et al 2009 [RCT -]; Smith et al 2011 [RCT +]; Taylor et al 1990 [RCT +]; Taylor et al 1996 [RCT +]; Wakefield et al 2004 [RCT ++]) that included telephone follow-ups for over 4 weeks. Such interventions were

effective (OR=1.54; 95%CI: 1.39-1.70). The studies were heterogeneous, with two outliers (Feeney et al 2001, [RCT ++]; Taylor et al 1996, [RCT +]). Removing them reduced the heterogeneity (p=0.24) with the result remaining significant (OR=1.48, 1.33-1.64).

Intensity 5: Ten studies (Bolman et al 2002 [RCT -]; Borglykke et al 2008 [RCT +]; British Thoracic Society A 1990 [RCT ++]; Carlsson et al 1997 [RCT -]; Hennrikus et al 2010 [RCT +]; Hilleman et al 2004 [RCT ++]; Lewis et al 2009 [RCT +]; Mohiuddin et al 2007 [RCT ++]; Pedersen et al 2005 [RCT -]; Vial et al 2002 [RCT-]) included at least one post-discharge face-to-face contact. They differed widely in the number of sessions and the nature of support provided. There were also substantial differences in the nature of the control interventions.. There was an overall significant effect (OR=1.66; 95%CI: 1.38-2.00), but the studies were heterogeneous. Removing the outliers, which provided intensive face-to-face treatment over extended periods of time (Hilleman et al. 2004, [RCT ++]; Mohiuddin et al 2007, [RCT ++]) reduced heterogeneity (p=0.19). The overall effect was reduced as well but it remained significant (OR=1.45, 1.19-1.76).

The analysis of studies which validated self-reported abstinence replicated the finding that only interventions of Intensity 4 and 5 which provide support to smokers over a period longer than 4 weeks showed efficacy.

PART 2: ROLE OF MEDICATION

Some of the interventions examined above included medications and some did not. The finding of differential effectiveness of interventions of different intensity could have been confounded by more intensive interventions being more likely to include pharmacotherapy.

We divided studies of each intensity into those that included medications (mostly NRT, sometimes with options including also bupropion and varenicline) and those that did not.

Intensity 1 – behavioural support only: Two studies (Brandt et al 1997 [RCT +]; Hennrikus, et al 2005 [RCT +]) included behavioural support only and this showed no effect on abstinence (OR=1.24; 95%CI: 0.87-1.76).

Intensity 1 – behavioural support plus medications: One study (; Papadakis et al 2011 [RCT +]) included medications. At this level of support, such interventions were not effective (OR=2.00; 95%CI: 0.30-13.26).

Intensity 2 – behavioural support only: Three studies (Hajek et al 2002 [RCT ++]; Pederson et al 1991 [RCT +]; Pelletier et al 1998 [RCT -]) included behavioural support only and pooled data show that this was not effective (OR=1.07; 95%CI: 0.79-1.45).

Intensity 2 – behavioural support plus medications: Three studies (Chouinard et al 2005 [RCT ++]; Molyneux et al 2003 [RCT ++]; Nagle et al 2005 [RCT +]) included medications. The interventions were not effective (OR=1.01; 95%CI: 0.71-1.42).

Intensity 3 – behavioural support only: Seven studies (Kim et al 2005 [RCT +]; Miller et al 1997 [RCT +]; Ortigosa et al 2000 [RCT +]; Rigotti et al 1994 [RCT +]; Schiebel et al 2007 [RCT -]; Stevens et al 1993 [RCT -]; Stevens et al 2000 [RCT -]) included behavioural support only and pooled data show that this was not effective (OR=1.17; 95%CI: 0.98-1.40).

Intensity 3 – behavioural support plus medications: Three studies (Neuner et al 2009 [RCT -]; Rigotti et al 1997 [RCT +]; Wiggers et al 2006 [RCT +]) included medications. At this level of support, such interventions were not effective (OR=1.19; 95%CI: 0.91-1.55).

Intensity 4 – behavioural support only: Eighteen studies (British Thoracic Society B 1990 [RCT ++]; Dornelas et al 2000 [RCT +]; Feeney et al 2001 [RCT ++]; Froelicher et al 2004 [RCT +]; Hasuo et al 2004 [RCT +]; Haug et al 2011 [RCT -]; Hennrikus et al 2005 [RCT +]; Horn et al 2008 [RCT -]; Li et al 2008 [RCT -]; Metz et al 2007 [RCT -]; Miller et al 1997 [RCT +]; Mosca et al 2010 [RCT +]; Rosal et al 1992 [RCT ++]; Sivarajan et al 2004 [RCT -]; Smith et al 2009 [RCT - ; Smith et al 2011 [RCT +]; Taylor et al 1996 [RCT +]; Wakefield et al 2004 [RCT ++])) included behavioural support only and pooled data show this level of support was effective (OR=1.51; 95%CI: 1.35-1.69).

Intensity 4 – behavioural support plus medications: Eight studies (Chouinard et al 2005b [RCT ++]; De Busk et al 1994 [RCT ++]; Lacasse et al 2008 [RCT -]; ; Quist-Paulsen et al 2003 [RCT +]; Reid et al 2003 [RCT +]; Reid et al 2007 [RCT -]; Simon et al 2003 [RCT +]; Taylor et al 1990 [RCT +]) included medications. At this level of support, such interventions were effective (OR=1.66; 95%CI: 1.33-2.08).

Intensity 5 – behavioural support only: Three studies (Bolman et al 2002 [RCT +]; British Thoracic Society A 1990 [RCT ++]; Carlsson et al 1997 [RCT -]) included behavioural support only and pooled data showed borderline efficacy (OR=1.28; 95%CI: 1.01-2.63).

Intensity 5 – behavioural support plus medications: Eight studies (Borglykke et al 2008 [RCT +]; Hennrikus et al 2010 [RCT +]; Hilleman et al 2004 [RCT ++]; Lewis et al 2009 [RCT +]; Mohiuddin et al 2007 [RCT ++]; Pedersen et al 2005 [RCT -]; Tonnesen et al 2006 [RCT ++]; Vial et al 2002 [RCT -]) included medications. At this level of support, such interventions were effective (OR=2.26; 95%CI: 1.71-2.98).

Low intensity interventions were ineffective with or without medications. Interventions of Intensity 4 and 5 showed uncertain or modest efficacy without medications and good efficacy when medications were included. The analysis of studies which validated self-reported abstinence replicated these findings.

SUBSECTION 2: PATIENT GROUPS

There is little reason to expect that stop-smoking interventions targeting dependent smokers motivated to quit will differ in efficacy depending on smokers' physical illness. However, we analysed separately the interventions for the main groups of hospital patients.

A. Patients with cardiovascular disease

The results are the same as for all patient groups together, showing lack of efficacy for low intensity interventions, and significant effects of more intensive interventions.

Intensity 1: There were no such studies

Intensity 2: Pooled results from 3 studies (Chouinard et al 2005 [RCT ++]; Hajek et al 2002 [RCT ++]; Pelletier et al 1998 [RCT -]) showed no effect of this intensity (OR=1.11; 95%CI: 0.82-1.51).

Intensity 3: Pooled results from 4 studies (Miller et al 1997 [RCT +]; Ortigosa et al 2000 [RCT +]; Rigotti et al 1997 [RCT +]; Wiggers et al 2006 [RCT +]) showed no effect of this intensity (OR=1.12; 95%CI: 0.83-1.52).

Intensity 4: Pooled results from 16 studies (Chouinard et al 2005 [RCT ++]; De Busk et al 1994 [RCT ++]; Dornelas et al 2000 [RCT +]; Feeney et al 2001 [RCT ++]; Froelicher et al 2004 [RCT +]; Lacasse et al 2008 [RCT -]; Li et al 2008 [RCT -]; Miller et al 1997 [RCT +]; Mosca et al

2010 [RCT +]; Quist-Paulsen et al 2003 [RCT +]; Reid et al 2003 [RCT +]; Reid et al 2007 [RCT -]; Rosal et al 1992 [RCT ++]; Sivarajan et al 2004 [RCT -]; Smith et al 2009 [RCT -]; Taylor et al 1990 [RCT +]) showed that this level of intensity is effective in patients with CVD (OR=1.54; 95%CI: 1.34-1.76).

Intensity 5: Pooled results from 6 studies (Bolman et al 2002 [RCT -]; Carlsson et al 1997 [RCT -]; Hennrikus et al 2010 [RCT +]; Hilleman et al 2004 [RCT ++]; Mohiuddin et al 2007 [RCT ++]; Pedersen et al 2005 [RCT -]) showed that this level of intensity is effective in patients with CVD (OR=1.81; 95%CI: 1.42-2.32).

B. Patients with respiratory disease

The results are similar to those from other patient groups, showing lack of efficacy for low intensity interventions, and better effects of more intensive interventions, although in this group of studies, only interventions with post-discharge face-to-face contact achieved a significant effect.

Intensity 1: There was only one study offering this intensity of treatment (Brandt et al 1997 [RCT +]) that showed no significant effect (OR=2.83; 95%CI: 0.77-10.47).

Intensity 2: Similarly one study offering this intensity of treatment (Pederson et al 1991 [RCT +]) showed no significant effect (OR=1.22; 95%CI: 0.55-2.70).

Intensity 3: No studies were available

Intensity 4: Pooled results from one study (British Thoracic Society B 1990 [RCT ++]) showed no effect of this intensity in patients with respiratory illness (OR=1.78; 95%CI: 1.16-2.74).

Intensity 5: Pooled results from 3 studies (Borglykke et al 2008 [RCT +]; British Thoracic Society A 1990 [RCT ++]; Tonnesen et al 2006 [RCT ++]; showed that this level of intensity is effective in patients with respiratory illness (OR=1.50; 95%CI: 1.11-2.02).

C. Patients with cancer

There was only one study focusing on cancer patients. This was Intensity 4 with no medications and showed no intervention effect (Wakefield et al 2004, [RCT ++]).

D. Unselected/other hospital patients

The results are similar as for all patient groups together, showing lack of efficacy for low intensity interventions, and significant effects of Intensity 4 interventions, though the results of the three Intensity 5 interventions did not reach significance.

Intensity 1: Pooled results from 2 studies (Hennrikus, et al 2005 [RCT +]; Papadakis et al 2011 [RCT +]) showed no effect (OR=1.18; 95%CI: 0.83-1.70).

Intensity 2: Results from two studies (Molyneux et al 2003 [RCT ++]; Nagle et al 2005 [RCT +]) showed no effect (OR=0.90; 95%CI: 0.62-1.30).

Intensity 3: Pooled results from 7 studies (Kim et al 2005 [RCT +]; Miller et al 1997 [RCT +]; Neuner et al 2009 [RCT -]; Rigotti et al 1997 [RCT +]; Schiebel et al 2007 [RCT -]; Stevens et al

1993 [RCT -]; Stevens et al 2000 [RCT -]) showed a modest improvement in abstinence rates (OR=1.19; 95%CI: 1.02-1.40).

Intensity 4: Pooled results from 10 studies (Feeney et al 2001 [RCT ++]; Hasuo et al 2004 [RCT +]; Haug et al 2011 [RCT -]; Hennrikus et al 2005 [RCT +]; Horn et al 2008 [RCT -]; Metz et al 2007 [RCT -]; Miller et al 1997 [RCT +]; Simon et al 2003 [RCT +]; Smith et al 2011 [RCT +]; Taylor et al 1996 [RCT +]) showed a positive effect (OR=1.60; 95%CI: 1.38-1.84).

Intensity 5: Pooled results from 2 studies (Lewis et al 2009 [RCT +]; Vial et al 2002 [RCT-]) failed to show a significant effect (OR=1.43; 95%CI: 0.85-2.42).

D. Patients receiving intervention after hospital discharge

Three trials evaluated interventions delivered after hospital discharge. Briefer interventions without medications lacked efficacy (Schofield et al 1999 [RCT +] Intensity 1. One study of an intensity 4 intervention involving extended contact and NRT had a positive result (Caruthers et al 2005 [RCT +]) whilst another showed no effect (Hanssen et al 2008 [RCT -]). Pooling data from the intensity 4 interventions shows a lack of effect (OR=1.62, 95%CI: 0.87-3.03).

CONCLUSIONS

The overall picture emerges showing that brief interventions (Intensity 1 and 2) with users of acute care are not effective, even if they include medications. Interventions providing support for over 4 weeks have modest or uncertain effects if they do not include medications, but they have significant effects when medications are included.

SECTION 2: EFFICACY OF INTERVENTIONS DELIVERED TO SURGICAL PATIENTS

Seven trials evaluated interventions initiated prior to surgery. With one exception (Croghan et al 2005, [RCT +]), all trials included NRT.

Intensity 1: No studies were available

Intensity 2: Two trials (Croghan et al 2005 [RCT +]; Martucci et al 2010 [RCT +]) found mixed effects but the pooled result reached statistical significance (OR=1.97; 95% CI:1.04-3.75).

Intensity 3: One study (Thomsen et al 2010 [RCT +]) showed no effect (OR=1.42; 95%CI: 0.43-4.74).

Intensity 4: Two studies (Ratner et al 2004 [RCT +]; Simon et al. 1997 [RCT +]) showed no effect (OR=1.37; 95% CI:0.83-2.27).

Intensity 5: Two studies (Lindstom et al 2008 [RCT ++]; Moller et al 2002 [RCT ++]) showed a significant effect (OR=3.99; 95%CI: 1.83-8.70).

One trial (Rodriguez et al 2007 [RCT -]) evaluated effects of one session of stop-smoking messages delivered under deep sedation, but failed to show an effect of this type of intervention (OR=0.82; 95%CI: 0.30-2.25).

CONCLUSIONS

Brief interventions (Intensity 1 and 2) initiated prior to surgery lack efficacy even if accompanied by NRT. Extended support accompanied by medication is effective. Stop-smoking messages delivered under sedation are not effective.

SECTION 3: EFFICACY OF PHARMACOLOGICAL INTERVENTIONS WITH HOSPITAL PATIENTS

In this section, we covered trials that evaluated medications by comparing study arms which differed in whether or not they received active medication, but which received the same intensity of behavioural support.

Six trials (Campbell et al 1991 [RCT ++]; Campbell et al 1996 [RCT ++]; Hand et al 2002 [RCT ++]; Lewis et al 1998 [RCT +]; Tonnesen et al 2000 [RCT ++]; Tonnesen et al 2006 [RCT ++]) compared NRT accompanied by behavioural support (intensity 4 or 5 in all studies) with the same support delivered with placebo or with no medication. NRT was effective (OR=1.52; 95%CI: 1.07-2.17).

One trial (Tonnesen et al 2000 [RCT ++]) compared patch and inhaler alone with the two medications combined. The results showed that single NRTs were as effective as their combination (OR=0.50; 95% CI: 0.16-1.53).

Two trials (Rigotti et al 2006 [RCT ++]; Simon et al 2009 [RCT +]) compared bupropion and placebo. Both trials relied on telephone calls and neither offered any post-quit face-to-face support. The trials did not show the intervention effective (OR=1.17; 95%CI:0.67-2.07).

One small placebo controlled trial (Steinberg et al 2011 [RCT +]) evaluated varenicline accompanied by brief counselling session/sessions (it is not clear if there was one or more, but it was attended by 16 participants only). The trial did not find the treatment effective (OR=0.64; 95%CI: 0.22-1.80).

CONCLUSIONS

NRT accompanied by behavioural support is effective. A combination of patches and inhaler was not more effective than each medication on its own. Bupropion and varenicline provided without on-going face-to-face support lack efficacy.

SECTION 4: EFFICACY OF INTERVENTIONS WITH PATIENTS' RELATIVES

Three trials of intervention of Intensity 1 and 2 evaluated interventions with parents of children hospitalised on paediatric wards (Chan et al 2005, [RCT -]; Mahabee-Gittens et al

2008, [RCT -]; Ralston et al 2008, [RCT -]). The interventions overall lacked efficacy despite this group studies having shorter follow-ups (OR=2.85; 95%CI 0.92-8.81).

Conclusions

Brief interventions (Intensity 1 and 2) with parents of hospitalised children lack efficacy.

Section 5: Efficacy of interventions with hospital staff

We found only one study (Dalsgaro et al 2004 [RCT ++] evaluating an intervention with hospital employees. The trial showed bupropion with regular face-to-face support to be an effective treatment for hospital employees (OR=2.84; 95%CI: 1.28-6.30).

Conclusions

Bupropion accompanied by intensive support is an effective treatment for hospital employees.

Narrative summary

Intervention intensity

A range of interventions aimed at helping smokers in acute care settings stop smoking has been proposed. Advice by doctors and nurses during a hospital visit, possibly repeated and reinforced during the hospital stay (if applicable) and accompanied by leaflets, is by far the simplest and least expensive option which could be provided routinely on a large scale. Unfortunately, there is no evidence that such interventions work. Smokers in acute care have usually received strong encouragements to stop smoking on a number of previous occasions and the fact that they continue to smoke despite high motivation to stop suggests a high level of dependence and a need for more intensive treatment.

The next level of intervention, which is still requiring modest resources is to reinforce the in-hospital intervention by telephone calls over the first few weeks after discharge. This too was not shown effective.

For interventions with acute care patients to be effective, an extended support and stop smoking medication provided for over 4 weeks seem necessary. Face-to-face support may provide better results than support provided over telephone. Importantly, support alone without medications has only uncertain effects but it has good efficacy when provided together with smoking cessation medications.

Patient groups

There is no a-priori reason to expect that smokers with different diagnoses would react differently to different interventions. We nevertheless analysed the main patient categories including patients with cardiovascular disease, respiratory disease, patients undergoing surgery, patients receiving intervention only after discharge, and general patient samples separately. The results broadly confirm the main findings. Only Intensity 5 interventions (over 4 weeks of face to face support) accompanied by medications were effective with patients undergoing surgery.

PHARMACOTHERAPY

NRT accompanied by extended multi-session support lasting over 4 weeks is effective in the acute services setting. A few small trials evaluated bupropion and varenicline accompanied by minimal support and did not find such treatments effective. NRT is known to be ineffective without support and follow-up and this is probably true for other stop-smoking medications as well.

PATIENT RELATIVES

Brief interventions (Intensity 1 and 2) with parents of hospitalised children did not show efficacy.

HOSPITAL STAFF

Bupropion with face-to-face support of over 4 weeks is an effective treatment for hospital staff.

IMPACT OF BACKGROUND OF STAFF DELIVERING THE INTERVENTIONS

We were unable to ascertain whether the background of the person providing the interventions affect outcomes, but given that extended support provided by staff other than doctors is effective, encouraging doctors to provide on-going telephone or face-to-face counselling sessions to smokers would not seem an economical approach. The professional background of stop-smoking advisors is likely to be of limited importance. The key ingredients of efficacy seem to be the length of support and inclusion of medications.

EVIDENCE STATEMENTS

Statements 1.1 to 1.5 concern non-surgical patients

ES 1.1: There is strong evidence from trials that validated self-reported abstinence rates that interventions with no follow-up (Intensity 1 and 2) are ineffective.

Two studies of level 1 intensity (Brandt et al 1997 [RCT +]; Papadakis et al 2011 [RCT +]), and five of level 2 intensity support (Chouinard et al 2005 [RCT ++]; Hajek et al 2002 [RCT ++]; Molyneux et al 2003 [RCT ++]; Nagle et al 2005 [RCT +]; Pederson et al 1991 [RCT +]) showed no effect. Pooled data from these studies confirm lack of effect: Intensity 1 OR=2.52 (95%CI: 0.86-7.40); Intensity 2 OR=0.96 (95%CI: 0.89-1.38)

ES 1.2: There is strong evidence from trials that validated self-reported abstinence rates that interventions delivered with telephone follow-ups for up to 4 weeks (Intensity 3) are not effective.

Six studies (Kim et al 2005 [RCT +]; Miller et al 1997 [RCT +]; Ortigosa et al 2000 [RCT +]; Rigotti et al 1994 [RCT ++]; Rigotti et al 1997 [RCT +]; Wiggers et al 2006 [RCT +]) showed no effect. Pooling these data give an odds ratio of 1.11 (95% CI: 0.89-1.38).

ES 1.3: There is strong evidence from trials that validated self-reported abstinence rates that interventions accompanied by on-going behavioural support for over 4 weeks in combination with smoking cessation medications are effective.

Of the eleven studies examining the efficacy of level 4 intensity interventions plus medication compared to usual care six showed a significant benefit (British Thoracic Society [RCT ++]; De Busk et al 1994 [RCT ++]; Feeney et al 2001 [RCT ++]; Miller et al 1997 [RCT +]; Quist-Paulsen et al 2003 [RCT +]; Taylor et al 1990 [RCT +]) and five did not (Chouinard et al 2005 [RCT ++]; Mosca et al 2010 [RCT +]; Rosal et al [RCT ++]; Smith et al 2011 [RCT +]; Wakefield et al 2004 [RCT ++]). When these studies are pooled there is evidence of a beneficial effect of this level of intervention (OR=1.65; 95%CI: 1.42-1.91). There were five studies examining level 5 intensity interventions with medication. Four showed a significantly positive effect (Borglykke et al 2008 [RCT +]; Hennrikus et al 2010 [RCT +]; Hilleman et al 2004 [RCT ++]; Mohiuddin et al 2007 [RCT ++]), and three did not (British Thoracic Society 1990 [RCT ++]; Lewis et al 2009 [RCT++]; Tonnesen et al 2006 [RCT ++]). When these studies are pooled there is evidence of a beneficial effect of this level of intervention (OR=1.87; 95%CI: 1.48-2.36).

ES 1.4: There is strong evidence that interventions with limited follow-up (Intensity 1-3) are not effective across non-surgical patient groups.

All interventions of intensity levels 1-3 were ineffective for patients with **cardiovascular disease** (Chouinard et al 2005 [RCT ++]; Hajek et al 2002 [RCT ++]; Pelletier et al 1998 [RCT -]; Miller et al 1997 [RCT +]; Ortigosa et al 2000 [RCT +]; Rigotti et al 1994 [RCT +]; Wiggers et al 2006 [RCT +]), **respiratory disease** (Brandt et al 1997 [RCT +]; Pederson et al 1991 [RCT +]), and **other groups of hospital patients** (Hennrikus, et al 2005 [RCT +]; Papadakis et al 2011 [RCT +]; Kim et al 2005 [RCT +]; Miller et al 1997 [RCT +]; Molyneux et al 2003 [RCT ++]; Nagle et al 2005 [RCT +]; Neuner et al 2009 [RCT -]; Rigotti et al 1997 [RCT +]; Schiebel et al 2007 [RCT -]; Steven et al 1997 [RCT]; Stevens et al 2000 [RCT -]).

ES 1.5: There is strong evidence that interventions with medications and follow-up of over 4 weeks are effective across non-surgical patient groups.

For patients with **cardiovascular disease** 8 trials of interventions for intensity 4-5 showed a positive effect (De Busk et al 1994 [RCT ++]; Feeney et al 2001 [RCT ++]; Hennrikus et al 2010 [RCT +]; Hilleman et al 2004 [RCT ++]; Mohiuddin et al 2007 [RCT ++] Quist-Paulsen et al 2003 [RCT +]; Smith et al 2011 [RCT +]; Taylor et al 1990 [RCT +]) and 14 did not (Bolman et al 2002 [RCT -]; Carlsson et al 1997 [RCT -]; Rosal 1992 [RCT ++]; Chouinard et al 2005 [RCT ++]; Dornelas et al 2000 [RCT +]; Froelicher et al 2004 [RCT +]; Lacasse et al 2008 [RCT -]; Li et al 2008 [RCT -]; Miller et al 1997 [RCT +]; Mosca et al 2010 [RCT +]; Pedersen et al 2005 [RCT -]; Reid et al 2003 [RCT +]; Reid et al 2007 [RCT -]; Sivarajan et al 2004 [RCT -]). When these studies are pooled there is evidence of a beneficial effect of this level of intervention. Intensity 4 OR=1.54 (95%CI: 1.34-1.76); Intensity 5 OR=1.81 (95%CI: 1.42-2.32).

For patients with **respiratory disease** 2 trials of interventions for intensity 4-5 showed a positive effect (British Thoracic Society B 1990 [RCT ++]; Borglykke et al 2008 [RCT +]) and 2 showed no effect (British Thoracic Society A 1990 [RCT ++]; Tonnesen et al 2006 [RCT ++]). There was only one study of intensity 4 intervention (British Thoracic Society B 1990 [RCT ++]) that showed benefit (OR=1.78; 95% CI:1.16-2.74). Pooling the intensity 5 intervention studies also showed a beneficial effect (OR=1.50 95%CI: 1.11-2.02).

For **other non-surgical groups of hospital patients** 5 trials of interventions for intensity 4-5 showed a positive effect (Feeney et al 2001 [RCT ++]; Haug et al 2011 [RCT -]; Metz et al 2007 [RCT -]; Miller et al 1997 [RCT +]; Taylor et al 1996 [RCT +]) and 7 did not (Hasuo et al 2004 [RCT +]; Hennrikus et al 2005 [RCT +]; Horn et al 2008 [RCT -]; Lewis et al 2009 [RCT +]; Simon et al 2003 [RCT +]; Smith et al 2011 [RCT +]; Vial et al 2002 [RCT-]). Pooling the intensity 4 intervention studies also showed a beneficial effect (OR=1.60 95%CI: 1.38-1.84). However pooling the two Intensity 5 studies (Lewis et al 2009 [RCT +]; Vial et al 2002 [RCT-]) showed no significant effect (OR=1.43; 95%CI: 0.85-2.42).

ES 1.6: There is mixed evidence concerning the efficacy of brief interventions in patients undergoing surgery.

Only one (Martucci et al 2010 [RCT +]) of three studies (Croghan et al 2005 [RCT +]; Martucci et al 2010 [RCT +]; Thomsen et al 2010 [RCT +]) investigating the efficacy of level 2-3 pre-operative smoking cessation interventions was positive. Pooling data from the intensity 2 studies (Croghan et al 2005 [RCT +]; Martucci et al 2010 [RCT +]) showed a borderline benefit of this level of intervention (OR=1.97; 95%CI: 1.04-3.75). The one study of intensity 3 interventions (Thomsen et al 2010 [RCT +]) showed no effect (OR=1.42; 95%CI: 0.42-4.74).

ES 1.7: There is moderate evidence that in patients undergoing surgery smoking cessation interventions relying mostly on telephone contact (intensity 4) are not effective.

Two trials (Ratner et al 2004 [RCT +]; Simon et al 1997 [RCT -]) showed no effect of this level of intervention. Pooled data gives an odds ratio of 1.37 (95%CI: 0.83-3.27).

ES 1.8: There is strong evidence that in patients undergoing surgery intensive interventions (intensity 5) alongside nicotine replacement therapy are effective.

Two trials (Lindstrom et al 2008 [RCT ++]; Moller et al 2002 [RCT ++]) show a positive effect. Pooled data gives an odds ratio of 3.99 (95%CI: 1.83-8.70).

ES 1.9: There is weak evidence that stop smoking messages delivered under deep sedation are not effective.

One trial (Rodriguez et al 2007 [RCT -]) showed no effect (OR=0.82; 95%CI: 0.30-2.25)

ES 1.10: There is strong evidence that nicotine replacement treatment accompanied by extended support is effective in general hospital patients.

Only one (Tonnesen et al 2006 [RCT ++]) of the six trials (Campbell et al 1991 [RCT ++]; Campbell et al 1996 [RCT ++]; Hand et al 2002 [RCT ++]; Lewis et al 1998 [RCT +]; Tonnesen et al 2000 [RCT ++]; Tonnesen et al 2006 [RCT ++]) examining the efficacy of NRT showed a positive effect. However pooling these data showed a benefit of NRT (OR=1.52; 95% CI: 1.07-2.17).

ES 1.11: There is moderate evidence that bupropion and varenicline provided without face-to-face support are ineffective in acute care non-surgical patients

Bupropion: two trials showed no effect (Rigotti et al 2006 [RCT ++]; Simon et al 2009 [RCT +]). Varenicline: one trial showed no effect Steinberg et al 2011 [RCT +]). The odds ratios (95% CI) for bupropion and varenicline are 1.17 (0.67-2.87) and 0.64 (0.22-1.80) respectively.

ES 1.12: There is weak evidence that low intensity interventions with smoking parents of hospitalised children lack efficacy.

Three trials (Chan et al 2005, [RCT -]; Mahabee-Gittens et al 2008, [RCT -]; Ralston et al 2008 [RCT -]) have all negative results. Pooling these data show no significant effect of such interventions (OR=2.85; 95%CI: 0.92-8.81). There were no studies investigating the efficacy of bupropion or varenicline combined with face-to-face support in acute care patients

ES 1.13: There is moderate evidence that treatment of hospital staff with bupropion combined with regular face-to-face support is effective.

One high quality trial (Dalsgaro et al 2004 [RCT ++]) found a positive effect.

Chapter 2: Smoking Cessation Interventions with Users of Maternity Services

We found 81 trials evaluating smoking cessation interventions with users of maternity services.

We were struck by the low quality of many of these studies, especially older ones. In many studies the denominators used to calculate success rates kept changing, key methodological details were not provided, validation results were not taken into account in calculating outcomes, comparison groups were clustered post-hoc, and papers convey a sense of a strenuous effort to come up with positive results.

The chapter is divided into five sections.

SECTION 1: EFFICACY OF BEHAVIOURAL INTERVENTIONS DELIVERED DURING PREGNANCY

PART 1: INTERVENTION INTENSITY

For each intensity of support, the results are presented separately for outcomes up to delivery, and outcomes post-delivery (usually from several months up to one year post-partum). We presented the results of all the studies first, and followed this with a meta-analysis including only trials which validated self-reported abstinence biochemically.

Intensity 1

Up to delivery: We found 17 studies that examined the effect of level 1 intensity interventions delivered during pregnancy on cessation rates up to delivery (Baric et al 1976 [RCT -]; Bauman et al 1983 [RCT -]; Dunkely et al 1997 [RCT -]; Hajek et al 2001 A [RCT ++]; Hjalmarson et al 1991 [RCT +]; Kendrick et al 1995 [RCT +]; Lowe et al 1998 A [RCT +]; Lowe et al 1998 B [RCT +]; MacArthur et al 1987 [RCT -]; Mayer et al 1990 [RCT -]; Moore et al 2002 [RCT +]; Petersen et al 1992 [RCT -]; Reading et al 1992 [RCT -]; Secker-Walker et al; 1997 [RCT +]; Windsor et al 1985 [RCT +]; Windsor et al 2000 [RCT +]; Windsor et al 1985 B [RCT +]. This type of intervention was not effective in increasing abstinence rates (OR=1.12; 95%CI:0.96-1.31).

Post partum: We found four studies that examined the efficacy of level 1 intensity intervenations on post-partum abstinence rates (Hajek et al 2001 [RCT ++]; Hjalmarson et al 1991 [RCT +]; Petersen et al 1992 [RCT -]; Strecher et al 2000 [RCT -]). The intervention had no effect on smoking cessation rates post-partum (OR=1.27; 95%CI: 0.91-1.78).

Conclusion: One-off interventions accompanied by written and other materials lack efficacy.

Intensity 2

Up to delivery: We found 2 studies that examined the effect of level 2 intensity interventions delivered during pregnancy on cessation rates in late pregnancy (Burling et al

1991 [RCT -]; Pbert et al 2004 [RCT -]). Pooling data from these studies showed a significant effect on abstinence rates (OR=2.08; 95%CI: 1.25-3.49), however given the low quality of these studies, the result should be interpreted with caution.

Post partum: Data from one study (Pbert et al 2004 [RCT -]) that examined the efficacy of level 2 intensity intervenations on post-partum abstinence rates showed a significant effect (OR=2.82; 1.21-6.57].

Conclusion: Two low quality studies evaluating intensity 2 interventions found an effect.

Intensity 3

Up to delivery: We pooled data from three studies (O'Connor et al 1992 [RCT +]; Tsoh et al 2010 [RCT -]; Valbo et al 1996 [RCT -]) that examined the effect of level 3 intensity smoking cessation interventions delivered during pregnancy on cessation rates in late pregnancy. The meta-analysis shows a benefit of such interventions (OR=1.48; 95% CI: 0.75-2.93).

Post partum: Two studies (O'Connor et al 1992 [RCT +]; Polanska et al 2004 [RCT -]) examined the efficacy of level 3 intensity intervenations on post-partum abstinence rates and pooled data showed a significant effect (OR=3.66; 95%CI: 2.28-5.87).

Conclusion: Four studies evaluating interventions that followed smokers up for up to 4 weeks found the interventions effective up to delivery. One study (O'Connor et al 1992 [RCT +]) with post-delivery follow-up found no long-term effect.

Intensity 4

Up to delivery: We found 13 studies (Bullock et al 1995 [RCT -]; Cinciripini et al 2000 [RCT +]; Dornelas et al 2006 [RCT +]; Ershoff et al 1989 [RCT ++]; Ershoff et al 1999 [RCT +]; Lilley et al 1986 [RCT -]; McBride et al 1999 [RCT -]; McLeod et al 2004 [RCT +]; Patten et al 2010 [RCT +]; Rigotti et al 2006 [RCT +]; Sexton et al 1984 [RCT +]; Solomon et al 2000 [RCT +]; Walsh et al 1997 [RCT +]) that examined the effect of level 4 intensity interventions delivered during pregnancy on cessation rates in late pregnancy. Pooling these data showed a significant effect of this type of intervention (OR=1.70; 95%CI: 1.43-2.01)

Post partum: Eight of the studies (Bullock et al 2009 [RCT +]; Cinciripini et al 2000 [RCT +]; Dornelas et al 2006 [RCT +]; McBride et al 1999 [RCT -]; McLeod et al 2004 [RCT +]; Rigotti et al 2006 [RCT +]; Stotts et al 2002 [RCT -]; Walsh et al 1997 [RCT +]) examined the effect of level 4 intensity intervenations on post-partum abstinence rates. The meta-analysis showed no effect of this level on intervention (OR=1.16; 95%CI: 0.87-1.55).

Conclusion: Intensity 4 interventions were effective up to delivery, but not after.

Intensity 5

Up to delivery: We found 17 studies that examined the effect of level 5 intensity interventions delivered during pregnancy on cessation rates in late pregnancy (Albrecht et al 1998 [RCT -]; Belizan et al 1995 [RCT -]; Cope et al 2003 [RCT -]; De Vries et al 2006 [RCT -]; Gielen et al 1997 [RCT +]; Hartman et al 1996 [RCT +]; Hegaard et al 2003 [RCT +]; Lawrence

et al 2003 [RCT +]; Loeb et al 1983 [RCT +]; Malchodi et al 2003 [RCT +]; Panjari et al 1999 [RCT +]; Secker-Walker et al 1994 [RCT -]; Tappin et al 2000 [RCT +]; Tappin et al 2005 [RCT +]; Thornton et al 1997 [RCT +]; Valbo et al 1994 [RCT -]; Windsor et al 1993 [RCT+]). Pooling data from these studies revealed a significant effect of this level of intervention (OR=1.51; 95% CI: 1.28-1.78).

Post partum: Pooling data from the four studies that examined the efficacy of level 5 intensity intervenations on post-partum abstinence rates (De Vries et al 2006 [RCT -]; Lawrence et al 2003 [RCT +]; Thornton et al 1997 [RCT +]; Valbo et al 1991 [RCT -]) showed no effect (OR=1.28; 95%CI: 0.90-1.81).

Conclusion: Intensity 5 interventions were also effective up to delivery, but not after.

Results of studies that validated self-reported abstinence

Intensity 1 – Validated

Up to delivery: Nine studies of level 1 intensity interventions delivered during pregnancy reported biochemically validated abstinence rates in late pregnancy (Hajek et al 2001 [RCT ++]; Hjalmarson et al 1991 [RCT +]; Kendrick et al 1995 [RCT +]; Lowe et al 1998 A [RCT +]; Lowe et al 1998 B [RCT +]; Moore et al 2002 [RCT +]; Secker-Walker et al; 1997 [RCT +]; Windsor et al 1985 [RCT +]; Windsor et al 1985 B [RCT +]). Pooling data showed no effect of this type of intervention on abstinence rates (OR=1.01; 95%CI:0.85-1.19).

Post partum: Pooling data from the three studies (Hajek et al 2001 [RCT ++]; Hjalmarson et al 1991 [RCT +]; Strecher et al 2000 [RCT -]) that examined the efficacy of level 1 intensity interventions on post-partum biochemically validated abstinence rates showed no effect (OR=1.46; 95%CI: 0.98-2.17).

Intensity 2 – Validated

There were no studies of this kind.

Intensity 3 – Validated

Up to delivery and Post partum: Only one study of level 3 intensity interventions delivered during pregnancy reported biochemically validated abstinence rates in late pregnancy and post-partum (O'Connor et al 1992 [RCT +]). This study showed no effect at either time point (End of pregnancy OR=2.42; 95%CI: 0.82-7.12; Post-partum OR =2.65; 95%CI: 0.91-7.71).

Intensity 4 – Validated

Up to delivery: Eight studies of intensity 4 interventions delivered during pregnancy reported biochemically validated abstinence rates in late pregnancy (Cinciripini et al 2000 [RCT +]; Dornelas et al 2006 [RCT +]; Ershoff et al 1989 [RCT ++]; Ershoff et al 1999 [RCT +]; Patten et al 2010 [RCT +]; +]; Rigotti et al 2006 [RCT +]; Solomon et al 2000 [RCT +]; Walsh et al 1997 [RCT +]). Only three of these studies showed a significant effect on their own, but

pooling the data showed that this type of intervention increased abstinence rates (OR=1.72; 95%CI:1.27-2.33).

Post partum: Pooling data from the six studies (Bullock et al 2009 [RCT +]; Cinciripini et al 2000 [RCT +]; Dornelas et al 2006 [RCT +]; Rigotti et al 2006 [RCT +]; Stotts et al 2002 [RCT -]; Walsh et al 1997 [RCT +]) that examined the efficacy of level 4 intensity interventions on post-partum biochemically validated abstinence rates did not show a significant effect (OR=1.27; 95%CI: 0.88-1.85).

Intensity 5 - Validated

Up to delivery: 12 studies of level 5 intensity interventions delivered during pregnancy reported biochemically validated abstinence rates in late pregnancy (Albrecht et al 1998 [RCT -]; Gielen et al 1997 [RCT +]; Hartman et al 1996 [RCT +]; Hegaard et al 2003 [RCT+]; Lawrence et al 2003 [RCT +]; Loeb et al 1983 [RCT +]; Malchodi et al 2003 [RCT +]; Panjari et al 1999 [RCT +]; Tappin et al 2000 [RCT +]; Tappin et al 2005 [RCT +]; Thornton et al 1997 [RCT +]; Windsor et al 1993 [RCT+]). Although only two of these studies showed a significant effect of the intervention on their own, pooling all the data showed a small but significant effect of this type of intervention on abstinence rates (OR=1.34; 95%CI:1.11-1.63).

Post partum: Two studies (Lawrence et al 2003 [RCT +], Thornton et al 1997 [RCT +]) examined the efficacy of level 5 intensity intervention on post-partum. They showed no significant effect (OR=0.93; 95%CI: 0.62-1.38), but note that this study showed no effect up to delivery either.

Background of advisors delivering the interventions

We compared validated studies evaluating interventions delivered by midwives and those delivered by advisors other than midwives.

There were four studies of intensity 1 interventions, three (Hajek et al 2001 [RCT ++]; Lowe et al 1998 A [RCT +]; Secker-Walker et al; 1997 [RCT +]) utilising midwives, and one (Windsor et al 1985 [RCT +]) using non-midwives. The one study using non-midwives showed an effect (OR=8.11, 95%CI: 1.79-36.68), the midwife delivered interventions did not (OR=1.02, 95%CI: 0.63-1.66).

There were nine studies of intensity 4 interventions, two utilising midwives (Solomon et al 2000 [RCT +]; Walsh et al 1997 [RCT +]), and seven that used non-midwives (Bullock et al 2009 [RCT +]; Cinciripini et al 2000 [RCT +]; Dornelas et al 2006 [RCT +]; Ershoff et al 1989 [RCT ++]; Patten et al 2010 [RCT +]; Rigotti et al 2006 [RCT +]; Stotts et al 2002 [RCT -]). Both showed a significant effect of this type of intervention (midwives OR=2.49, 95%CI: 1.19-5.24; non-midwives 1.40 95%CI: 1.02-1.92).

There were thirteen studies of intensity 5 interventions, six utilising midwives (Hegaard et al 2003 [RCT+]; Lawrence et al [RCT +]; Panjari et al 1999 [RCT +]; Tappin et al 2000 [RCT +]; Tappin et al 2005 [RCT +]; Thornton et al 1997 [RCT +]) and seven that used non-midwives Gielen et al 1997 [RCT +]; Hartman et al 1996 [RCT +]; Loeb et al 1983 [RCT +]; Lowe et al 1997 [RCT +]; Malchodi et al 2003 [RCT +]; Pollack 2007 et al, [RCT ++]; Windsor et al 1993 [RCT+]). Both showed a significant effect of this type of intervention (midwives OR=1.33, 95%CI: 1.00-1.77; non-midwives 1.47 95%CI: 1.15-1.88).

The professional background of advisors delivering the intervention had no effect on outcome.

Conclusions

In studies that validated self-reported abstinence, brief one-off interventions (Intensity 1) were not effective. The only study of Intensity 3 interventions (O'Connor 1992, [RCT +]) did not detect a significant effect. Intensity 4 and 5 interventions showed efficacy during pregnancy and up to delivery. The effects did not extend into post-natal period. The professional background of advisors delivering the intervention had no effect on outcome.

SECTION 1A: EFFECTS OF INCENTIVES

There were 4 studies examining the effects of incentives contingent on abstinence (Donatelle et al 2000 [RCT ++]; Heil et al 2008 [RCT ++]; Higgins et al 2004 [RCT +]; Higgins et al 2010 [RCT +]. All validated self-reported abstinence biochemically. Pooling these data showed a significant effect both up to delivery (OR=5.77; 95%CI: 3.34-9.98) and post-partum (OR=5.86; 95%CI: 2.74-12.52).

Three of the studies followed up the participants after the incentives were discontinued (Heil et al 2008 [RCT ++]; Higgins et al 2004 [RCT +]; Higgins et al 2010 [RCT +]). Pooling data from these studies confirmed an ongoing benefit of incentives (OR=10.29; 95%CI: 2.75-38.51)

Conclusions

Provisions of incentives contingent on abstinence was effective in increasing cessation rates both pre-delivery and post-partum, and the effect was maintained even after the incentives were discontinued.

SECTION 1B: EFFICACY OF INTERVENTIONS TARGETING PARTNERS

We found only one study of a stop-smoking intervention targeting partners of pregnant women (De Vries 2006, [RCT -]). The study write-up does not allow data extraction, but the authors report that the intervention had no effect. Three other studies involved partners. Lilley et al. 1986 [RCT -] used leaflets directed at both the woman and her partner. Lowe et al. 1998 [RCT +] used an intervention which included a no-smoking contract between the woman and her partner. McBride et al. 2004 [RCT +] included partners as coaches and also provided support for partners who smoke. The studies do not allow data extraction on the partner component, but all three had overall negative results.

SECTION 2: EFFICACY OF INTERVENTIONS DELIVERED POST-PARTUM

Three trials studied interventions provided to women after delivery (Winickoff et al 2010 [RCT +]; Hannover et al 2009 [RCT -]; Wall et al 1995 [RCT -]). None of the trials validated

self-reported abstinence and only the highest intensity intervention (intensity 5) studied by Wall et al (1995) showed an effect.

SECTION 3: EFFICACY OF PHARMACOTHERAPIES

Nicotine replacement therapy is the only drug treatment that has been evaluated for use in pregnancy so far. All the trials validated self-reported abstinence biochemically at some time points at least. Four trials used patches (Coleman et al 2012, [RCT ++]; Hotham et al 2006 [RCT ++]; Kapur et al 2001, [RCT +]; Wisborg et al 2000, [RCT ++]), one used gum (Oncken et al 1998, [RCT +]) and one used a choice between patch, gum or lozenge (Pollack 2007 et al, [RCT ++]). The results were negative across the levels of support.

Nicotine replacement treatment did not show efficacy across the levels of support.

SECTION 4: EFFICACY OF INTERVENTIONS TO PREVENT RELAPSE

We found 14 studies (Ershoff et al 1995 [RCT +]; Hajek et al [RCT ++]; Hannover et al 2009 [RCT -]; Johnson et al 2000 [RCT +]; Lowe et al 1997 [RCT +]; McBride et al 1999 [RCT -]; McBride et al 2004 [RCT +]; Morasco et al 2006 [RCT +]; Pbert et al 2004 [RCT -]; Ratner et al 2000 [RCT -]; Reitzel et al 2010 [RCT ++];Ruger et al 2008 [RCT -]; Secker-Walker et al 1995 [RCT +]; Secker-Walker et al 1998 [RCT ++]; Severson et al 1997 [RCT -]; Van't Hof et al 2000 [RCT-]) focused on women who stopped smoking, with the aim of helping them to prevent relapse during and after pregnancy.

Regardless of how the studies were grouped (time of intervention, intensity of intervention, validation of abstinence) the interventions showed no effect.

NARRATIVE SUMMARY

INTERVENTION INTENSITY

As with acute care smokers, a range of interventions aimed at users of maternity services has been proposed. Advice by midwives accompanied by leaflets is by far the simplest and least expensive option that could be provided routinely on a large scale. It has been evaluated in 20 randomised trials and pooling them together shows that such one-off interventions have little effect.

Pregnant smokers are likely to have received strong encouragements to stop smoking from their friends, families, and health care providers. Those who continue to smoke despite such advice may need more intensive help.

Interventions of Intensity 2 and 3 were evaluated in only a small number of trials. The results suggest that these are likely to have only limited, if any, effects. Interventions of Intensity 4 and 5 however show efficacy, although the effects are not maintained after delivery.

It is worth noting that unlike in studies of acute care interventions, there was no observable trend in favour of face-to-face contact compared to telephone support. This could be in part

at least due to difficulties reported in some studies in getting pregnant women to attend face-to-face sessions.

The only Intensity 1 trial with a positive result used non-midwifery advisors. The efficacy of interventions of Intensity 4 and Intensity 5 was similar regardless of the professional background of the person delivering the intervention. These results correspond with the results of a survey of UK services for pregnant smokers (Taylor and Hajek, 2001). Some services employed midwives to deliver specialist stop-smoking interventions while others employed advisors with different backgrounds. Advisor background had no effect on 4-week success rates.

The current practice within NHS is for pregnant smokers to receive multisession support and medication from stop smoking specialists employed by local stop smoking services. The key finding of this review supports this practice.

Interventions using incentives contingent on abstinence

There is evidence that progressive reinforcement schedules using incentives contingent on abstinence are effective. It should be noted that the existing studies used carefully designed schedules where continuing abstinence was frequently checked and the rewards were progressive, with temporary lapses resetting the rewards to lower levels. This differs from some of the uncontrolled experiments conducted currently within the NHS. Implementing such interventions in routine care would be demanding. The staff would need to strictly adhere to schedules and frequent contacts from the above studies, and measures would need to be in place to try to limit a range of problems inherent in this approach.

Efficacy of pharmacotherapy

Nicotine replacement therapy in pregnancy is considered much safer than smoking (see Review 1) but only a few studies have evaluated its use in pregnancy and several of them were aborted due to concerns, which were in all cases shown unwarranted. As with other populations, NRT did not work when accompanied by minimal behaviour support. However, in this group, it did not show efficacy even when accompanied by more intensive support. Only a few studies with relatively small samples are available, the results go in the 'right' direction and it is possible that another large trial with the same trend would tip the pooled results over the significance line. It is also possible that NRT accompanied by home visits as provided by the UK services may be effective, but additional trials are needed to determine this (see Research Gaps below).

Interventions with partners

We did not find any positive results of such interventions, but they were not extensively evaluated. Recruiting pregnant women is generally difficult, and large studies recruiting women plus smoking partners may not be practicable.

Interventions to prevent relapse

Interventions to prevent relapse in women who stopped smoking recently show no effect, regardless of their timing (during pregnancy, at delivery, or post-partum).

Evidence Statements

ES: 2.1: There is strong evidence from trials that validated self-reported abstinence rates that low intensity (intensity 1-3) smoking cessation interventions in pregnancy (i.e. those

that have minimal contact and follow-up for < 1 month following a target quit date) have no effect on abstinence rates in late pregnancy.

Only one study (Windsor et al 1985 [RCT +]) found an effect of a low intensity intervention (Intensity 1) whilst ten showed no effect (Hajek et al 2001 [RCT ++]; Hjalmarson et al 1991 [RCT +]; Kendrick et al 1995 [RCT +]; Lowe et al 1998 A [RCT +]; Lowe et al 1998 B [RCT +]; Moore et al 2002 [RCT +]; O'Connor et al 1992 [RCT +]; Secker-Walker et al; 1997 [RCT +]; Windsor et al 1985 [RCT +]; Windsor et al 1985 B [RCT +]). Pooling data from these studies showed no significant effect. Intensity 1 OR=1.01 (95%CI: 0.85-1.19); Intensity 3 OR=2.42 (95%CI: 0.82-7.12).

ES 2.2: There is moderate evidence from trials that validated self-reported abstinence rates that low intensity (intensity 1-3) smoking cessation interventions in pregnancy have no effect on abstinence rates post-partum.

Three studies (Hajek et al 2001 [RCT ++]; (O'Connor et al 1992 [RCT +]; Strecher et al 2000 [RCT -]) showed no effect and one (Hjalmarson et al 1991 [RCT +]) showed a modest benefit. Pooling data from these studies showed no significant effect. Intensity 1 OR=1.46 (95%CI: 0.98-2.17); Intensity 3 OR=2.65 (95%CI: 0.91-7.71).

ES 2.3: There is strong evidence from trials that validated self-reported abstinence rates that higher intensity (intensity 4-5) smoking cessation interventions in pregnancy (i.e. those that provide follow-up for > 1 month after a target quit date, either by telephone, written or electronic correspondence or face-to-face contact) increase abstinence rates in late pregnancy.

Six studies (Dornelas et al 2006 [RCT +]; Ershoff et al 1989 [RCT ++]; Walsh et al 1997 [RCT +]; Hartman et al 1996 [RCT +]; Hegaard et al 2003 [RCT+] Windsor et al 1993 [RCT+]) demonstrated efficacy of such interventions (Intensity 4-5), whilst 14 showed no effect (Albrecht et al 1998 [RCT -]; Cinciripini et al 2000 [RCT +]; Ershoff et al 1999 [RCT +]; Gielen et al 1997 [RCT +];; Lawrence et al [RCT +]; Loeb et al 1983 [RCT +]; Malchodi et al 2003 [RCT +]; Panjari et al 1999 [RCT +]; Patten et al 2010 [RCT +]; Rigotti et al 2006 [RCT +]; Solomon et al 2000 [RCT +]; Tappin et al 2000 [RCT +]; Tappin et al 2005 [RCT +]; Thornton et al 1997 [RCT +]). Pooling data from these studies showed a significant effect. Intensity 4 OR=1.72 (95%CI: 1.27-2.33); Intensity 5 OR=1.34 (95%CI: 1.11-1.63).

ES 2.4: There is strong evidence from trials that validated self-reported abstinence rates that high intensity (intensity 4-5) smoking cessation interventions in pregnancy do not increase abstinence rates post-partum.

One RCT (Walsh et al 1997 [RCT +]) showed that this type of intervention retained its beneficial effect on abstinence rates into the post-partum period, however this finding was not replicated by others (Bullock et al 2009 [RCT +]; Cinciripini et al 2000 [RCT +]; Dornelas et al 2006 [RCT +]; Lawrence et al [RCT +]; Rigotti et al 2006 [RCT +]; Stotts et al 2002 [RCT -]; Thornton et al 1997 [RCT +]). Pooling data from these studies showed no significant effect. Intensity 4 OR=1.27 (95%CI: 0.88-1.85); Intensity 5 OR=0.93 (95%CI: 0.62-1.38).

ES 2.5: There is no evidence that interventions delivered by midwives are more effective than interventions delivered by other providers such as counsellors and health advisors.

Only one Intensity 1 trial had a positive result and this trial used a non-midwifery intervention (Windsor et al 1985 [RCT +]). The efficacy of interventions of Intensity 4 (Bullock et al 2009 [RCT +]; Cinciripini et al 2000 [RCT +]; Dornelas et al 2006 [RCT +]; Ershoff et al 1989 [RCT ++]; Patten et al 2010 [RCT +]; Rigotti et al 2006 [RCT +]; Stotts et al 2002 [RCT -]; Solomon et al 2000 [RCT +]; Walsh et al 1997 [RCT +]) and Intensity 5 (Gielen et al 1997 [RCT +]; Hartman et al 1996 [RCT +]; Loeb et al 1983 [RCT +]; Lowe et al 1997 [RCT +]; Malchodi et al 2003 [RCT +]; Pollak et al 2007 [RCT +]; Hegaard et al 2003 [RCT +]; Lawrence et al 2003 [RCT +]; Panjari et al 1999 [RCT +]; Tappin et al 2000 [RCT +]; Tappin et al 2005 [RCT +]; Thornton et al 1997 [RCT +]) were similar regardless of the professional background of the person delivering the intervention.

ES 2.6: There is strong evidence that the provision of financial incentives (vouchers redeemable for retail items for up to >$1,000) contingent on abstinence is effective in increasing cessation rates in late pregnancy, post-partum, and after the incentives are discontinued.

All four studies identified that examined this type of intervention demonstrated efficacy at time points up to delivery (Donatelle et al 2000 [RCT ++]; Heil et al 2008 [RCT ++]; Higgins et al 2004 [RCT +]; Higgins et al 2010 [RCT +])

Three studies demonstrated efficacy post-partum (Donatelle et al 2000 [RCT ++]; Higgins et al 2004 [RCT +]; Higgins et al 2010 [RCT +]), whilst one did not (Heil et al 2008 [RCT ++]). Pooled results show efficacy (OR=5.86; 2.74-12.52)

Two studies demonstrated efficacy post-discontinuation (Higgins et al 2004 [RCT +]; Higgins et al 2010 [RCT +]), whilst one did not (Heil et al 2008 [RCT ++]). Pooled results show efficacy (OR=10.29; 95%CI: 2.75-38.51).

ES 2.7: There is weak evidence that smoking cessation interventions targeting partners of pregnant women are ineffective.

One study (De Vries et al 2006, [RCT-) found no effect of such intervention with partners but did see a significant effect on women smokers. The three others (Lilley et al. 1986 [RCT -]; Lowe et al. 1998 [RCT +]; McBride et a. 2004 [RCT +]), which included a partner component had overall negative results as well in terms of women or partner smoking.

ES 2.8: There is weak evidence that low intensity interventions delivered to women post-partum are not effective and high intensity interventions are effective.

One study (Winickoff et al 2010 [RCT +]) showed no effect of Intensity 1 intervention. One study of Intensity 4 intervention (Hannover et al 2009 [RCT -]) showed no effect, whilst another of intensity 5 (Wall et al 1996 [RCT -]) demonstrated efficacy.

ES 2.9: There is strong evidence from trials that validated self-reported abstinence rates that nicotine replacement therapy, when used in standard doses, is ineffective in helping pregnant women quit smoking during pregnancy.

Of the six studies, four examined the use of patches (Coleman et al 2012, [RCT ++]; Hotham et al 2006 [RCT ++]; Kapur et al 2001, [RCT +]; Wisborg et al 2000, [RCT ++]), one of gum (Oncken et al 1998, [RCT +]) and one of a choice between patch, gum or lozenge (Pollak 2007 et al, [RCT ++]). None demonstrated a significant benefit over placebo across levels of support. Pooling interventions of different intensity provided negative results as well: Intensity 3 OR=1.27 (95%CI: 0.82-1.96); Intensity 4 OR=8.20 (95%CI: 0.40-169.90); Intensity 5 OR=1.48 (95%CI: 0.96-2.28).

ES 2.10: There is strong evidence from trials that validated self-reported abstinence rates that nicotine replacement therapy, when used in standard doses, has no effect on abstinence rates post-partum.

Three trials (Oncken et al 1998, [RCT +]; Pollack 2007 et al, [RCT ++]; Wisborg et al 2000, [RCT ++]) failed to demonstrate long-term efficacy of NRT. Pooling data from these studies showed no significant effect. Intensity 5 OR=1.08 (95%CI: 0.65-1.79).

ES 2.11: There is strong evidence from trials that validated self-reported abstinence rates that interventions aimed to prevent relapse in women who stopped smoking during pregnancy are ineffective regardless of their timing.

All 9 studies that focused on relapse prevention during and after pregnancy failed to show any beneficial effect (Ershoff et al 1995 [RCT +]; Hajek et al [RCT ++]; Johnson et al 2000 [RCT +]; Lowe et al 1997 [RCT +]; McBride et al 2004 [RCT +]; Morasco et al 2006 [RCT +]; Reitzel et al 2010 [RCT ++]; Secker-Walker et al 1995 [RCT +]; Secker-Walker et al 1998 [RCT ++]). Pooling these data confirm a lack of effect (OR=1.15; 95%CI: 0.94-1.43)

APPLICABILITY STATEMENT AND RESEARCH GAPS

The NHS practice currently involves referral of pregnant women who smoke to specialist smoking cessation treatment that typically consists of multi-session behavioural support for at least 4-weeks following a target quit date supplemented by the use of NRT and usually also by home visits. This is more intensive than any of the interventions evaluated so far. Women are referred by midwives and the intervention is provided by specialist pregnancy advisors employed for this purpose. The service is expensive because only a relatively small number of pregnant smokers attend treatment and the success rates are lower than in the mainstream service, but it is felt that if pregnant smokers were referred to mainstream service instead, the proportion of women taking up the referral and the results would be even lower. In this sense, the current UK practice have overtaken research results

We identified four areas where more research is needed.

1. The reviewed evidence suggests that lower intensity interventions are effective and that NRT is not effective in this population. The UK advisors however provide a more intensive support than that examined in any of the studies reviewed. It is possible that NRT accompanied by this level of support is more effective than other options, but it is also possible that more economical interventions with a wider reach would provide the same or better results. Some of the minimal support studies reviewed above reported very high success rates (mostly studies with low quality rating), but overall the quit rates tended to be under 10%, and lower in studies which followed the women post-partum. A trial is needed comparing the current UK practice of intensive specialist support, home visits and medication with an Intensity 3 or 4 intervention which could be delivered routinely by midwives.

2. There is good evidence that incentives contingent on abstinence facilitate smoking cessation. It should be noted though that the procedure shown effective required frequent visits, progressive reinforcement, and re-setting the rewards after lapses. The NHS is currently experimenting with incentives schemes, but these are typically provided in a much looser way and their efficacy is not formally evaluated. There are potential problems with the approach as discussed in Myers at al (2009), but it may hold a promise. A randomised evaluation of its implementation in routine care would help to assess its practicality, cost, and likely impact.

3. Regarding the lack of efficacy of relapse prevention interventions, in this area, an additional problem is that pregnant women who stopped smoking are unlikely to use medications or attend treatment sessions. Opportunistic encouragements and written materials which until recently were the only practicable options are known to lack efficacy. Currently however, electronic media provide a new alternative. A relapse prevention intervention based on text messaging has been shown practicable and it currently awaits a formal evaluation. If proven effective in general population (where such evaluation would be much easier to implement than in pregnant smokers), the next step would be to evaluate such approach formally with users of maternity services as well.

4. Regarding stop smoking medications, two approaches await evaluation. A. Pregnant women metabolise nicotine about twice as fast as non-pregnant smokers. It is possible that NRT dosing which follows the standard labelling leads to under-dosing in pregnancy and that higher dosing may achieve better results. B. Varenicline has been shown effective with several hard to reach groups. It has no known teratogenic effects. Given the lack of evidence that NRT helps in pregnancy and the high priority of smoking cessation in pregnancy, studies are needed to determine safety and efficacy of varenicline in this group.

INTRODUCTION

Each year thousands of smokers are admitted to secondary care in the United Kingdom (UK) for treatment of smoking related diseases. Hospitalisation provides a unique opportunity for people to stop smoking. Smokers who are admitted to hospital are often highly motivated to quit and the hospital setting provides a potentially supportive environment to do so. Hospitals are smokefree environments and admission brings smkokers into direct contact with healthcare professionals who can advise on giving up smoking and offer evidence-based treatment.

Pregnancy is another opportune moment for stopping smoking. Most women in the UK know that smoking in pregnancy is discouraged and many are aware of some of the risks it can pose to their unborn child. Midwives and other primary care workers provide encouragement and advice and most stop-smoking services offer specialist help.

There exists extensive literature on interventions in these settings, which can contribute to guidelines on how best to support such smokers. The literature can be divided into trials which evaluate specific stop smoking interventions, and papers which concern barriers and facilitators to implementing specific treatments and overall smoke-free and tobacco control provision in acute services and within maternity care pathways.

This review concerns the efficacy of smoking cessation interventions with hospital patients and their relatives and with pregnant women and their partners. Review 3 addresses the barriers and facilitators and practical circumstances of delivering smoking cessation help to these groups.

AIM

The aim of this review is to examine the efficacy of smoking cessation interventions delivered in acute services (including patients, visitors, and staff) and to users of maternity services who smoke and their partners.

RESEARCH QUESTIONS

This review aims to answer the following two questions posed by NICE:

Question 1: How effective are smoking cessation interventions in helping people from the populations of interest?

Question 2: How effective are interventions for temporary abstinence in helping people from the populations of interest?

STRUCTURE OF THE REVIEW

The review is divided into two chapters that address the two populations of interest: (1) users of acute secondary care services and staff and visitors of these services, and (2) users of maternity services and their partners.

Chapter 1 concerns users of acute secondary care services and staff and visitors of these services and is divided into five sections.

Section 1 covers the efficacy of interventions delivered to non-surgical patients. This section concerns trials comparing interventions of different intensity with minimal support or usual care;

Section 2 covers the efficacy of interventions delivered to patients undergoing surgery;

Section 3 covers the efficacy of pharmacotherapies to aid smoking cessation in acute secondary care service users. This section concerns trials where comparison groups differed in the provision of medications but not in the level of behavioural support;

Section 4 covers the efficacy of interventions delivered to hospital employees;

Section 5 covers the efficacy of interventions delivered to parents of hospitalised children

Chapter 2 concerns the efficacy of interventions delivered to users of maternity services and their partners. It is divided into four sections.

Section 1 covers the efficacy of interventions delivered to pregnant women. This section concerns trials comparing interventions of different intensity with minimal support or usual care. Two separate subsections cover studies examining the efficacy of interventions based on incentives; and studies examining the efficacy of interventions targeting partners of pregnant women;

Section 2 covers the efficacy of interventions delivered post-partum;

Section 3 covers the efficacy of pharmacotherapies to aid smoking cessation in users of maternity services. This section concerns trials where study arms received the same intensity of behavioural support, but differed in receiving or not receiving active pharmacotherapy;

Section 4 covers efficacy of interventions to prevent relapse.

In both Chapters, each section includes meta-analyses and narrative summaries. An interpretative evaluation and evidence statements are at the end of the Chapters.

METHODOLOGY

TYPES OF STUDIES CONSIDERED IN THIS REVIEW

We included all randomised controlled trials with the populations of interest as well as trials with patients' relatives and with staff.

TYPES OF INTERVENTIONS CONSIDERED IN THIS REVIEW

In the Chapter concerning acute secondary care services, we included any intervention that was initiated during hospitalisation and that aimed to assist clients in stopping or reducing smoking or in remaining abstinent. We also included studies where interventions started before and after hospitalisation, e.g. those commenced during pre-operative assessment or initiated after discharge, where such practice could be initiated by the secondary care teams. Studies of smoking interventions delivered as part of broader rehabilitation programmes were included if it was possible to extract data on the outcome of the smoking cessation component. We also included interventions that were delivered to staff and visitors of acute services. In the Chapter concerning pregnancy, any intervention that was initiated during are after pregnancy and that aimed to assist users of maternity services in stopping or reducing smoking or in remaining abstinent was included.

CATEGORISING INTERVENTIONS BY INTENSITY

A number of different types of behavioural interventions have been proposed to help smokers quit. They can be categorised according to their theoretical underpinning, use of treatment aids such as booklets, videos and biological feedback, background of the person delivering the intervention, etc. The Cochrane review of interventions with hospital patients (Rigotti et al. 2007 [Systematic review, ++]) categorised the interventions according to the length of time over which support was provided. Length of support is generally related to the cost of the intervention and also to its efficacy. Such approach seems practical for informing clinical recommendations and we used it throughout this review.

The studies have been categorised by the length of time over which support was provided, and whether extended contact was face-to-face or not, into the following levels of intensity:

Intensity 1: Single contact with or without take-away written and other materials, no follow-up support.

Intensity 2: One or more contacts with or without take-away written and other materials up to but not beyond the target quit date (TQD)

Intensity 3: Any contact plus follow-up for up to but not beyond 4 weeks after TQD

Intensity 4: Any contact plus telephone/correspondence/e-mail etc. follow-up for > 1 month

Intensity 5: Any contact plus follow-up for > 1 month including at least one face-to-face contact

For the purposes of evidence statements, the term brief intervention will be used as a term to reflect both intensity 1 & 2 interventions. Intensive support will be used as a term for intensity 3-5 interventions.

We also considered whether the interventions work when they are and when they are not accompanied by pharmacological treatments.

Issues not covered in this review

We excluded trials of interventions delivered entirely outside the secondary care and maternity care settings, and trials with psychiatric patients. This review did not consider evidence relating to the health benefits of stopping smoking. Interventions with health care professionals aimed at identifying smokers and referring them to treatment were initially scheduled as a part of this review. However, the consideration of such trials fits more closely into the forthcoming review of treatment barriers and facilitators.

Outcomes and data extraction

For trials concerning secondary care, the principal outcome measure was abstinence from smoking at least six months after the start of the intervention. For trials concerning users of maternity services, the principal outcome measure was abstinence from smoking at the longest follow-up period up to and including delivery; and separately abstinence from smoking at the longest follow-up after delivery.

Regarding data extraction, we followed the approach used in the Cochrane reports and extracted data indicating the most conservative measure of quitting at the longest follow up. Biochemically validated quit rate was preferred to self-reported abstinence, continuous or sustained abstinence was preferred to point prevalence abstinence, and abstinence at later time-points was preferred to abstinence at shorter time points. Participants lost to follow up were counted as continuing smokers.

Evaluation of trial quality

In smoking cessation studies where study arms differ in patient contact, one of the main potential sources of bias is lack of validation of self-reported abstinence. This is because participants who receive more attention and resources can feel under greater pressure to report benefit. Another factor which has a potential to bias smoking cessation studies is the use of short-term 7-day 'point prevalence' abstinence reported long after the intervention finished, as opposed to sustained abstinence that traces the effects of the initial intervention. Not using ITT is the third major potential source of bias as patients failing in their quit attempt are more likely to drop out than those who are successful. We were able to largely remove this bias as most studies reported the original sample sizes and so we were able to re-calculate ITT results where needed. We also assessed randomization procedures and allocation concealment, but these features can be expected to have only limited impact on trials of smoking cessation interventions where there exist no strong predictors of outcome.

Each of the included studies was rated ++, + or - to indicate its quality. The quality of the included reviews was assessed using criteria outlined in NICE guidance. The quality of included trials was assessed as follows.

Table 1: Quality assessment ratings

++	Self-reported abstinence was verified biochemically, sustained or continuous abstinence reported, no other risks of bias
+	Self-reported abstinence was verified biochemically, only point prevalence abstinence reported, no major risks of bias
–	Self-reported abstinence not validated and/or other major risks of bias (e.g. incomplete randomization, unclear N, unclear calculation of success rates)

We rated the quality of reviews as ++ for systematic reviews showing awareness of key methodological features of stop-smoking studies, + for reviews which were less systematic and/or did not take into account the key quality aspects of included studies, and – for reviews which were selective and/or posed methodological problems.

DATA ANALYSIS

Where it was appropriate to pool studies, data were entered into RevMan 5. We pooled data using Mantel-Haenszel fixed-effect method, with 95% confidence intervals. To investigate statistical heterogeneity we used the I^2 statistic. Where there was substantial heterogeneity between studies we explored possible reasons for this using subgroup analyses. We express results as odds ratios (intervention odds/control odds) for achieving abstinence from smoking together with the 95% confidence interval for this estimate.

EVIDENCE STATEMENTS

Evidence statements used in this review contain a descriptor, strength, and direction of the evidence.

Scoring the strength of evidence was based on the quality of the individual studies, the number of studies included in the meta-analysis, and the results of the meta-analysis.

The strength of evidence was classified as:

- No evidence
- Weak evidence: None of the included studies score [+] for quality and/or the result of the meta-analysis is only marginally significant
- Moderate evidence: One or more studies score [+] or [++] for quality and the result of the meta-analysis is significant, but most studies are of low quality and/or less than 3 studies are included and/or the results of the meta-analysis are heterogeneous
- Strong evidence: One or more studies score [+] and [++] for quality, the result of the meta-analysis is significant and homogenous, and there are more than two studies included in the meta-analysis

APPLICABILITY STATEMENTS

The degree of applicability of the main conclusions to the UK setting is assessed in the narrative summary at the end of each Chapter.

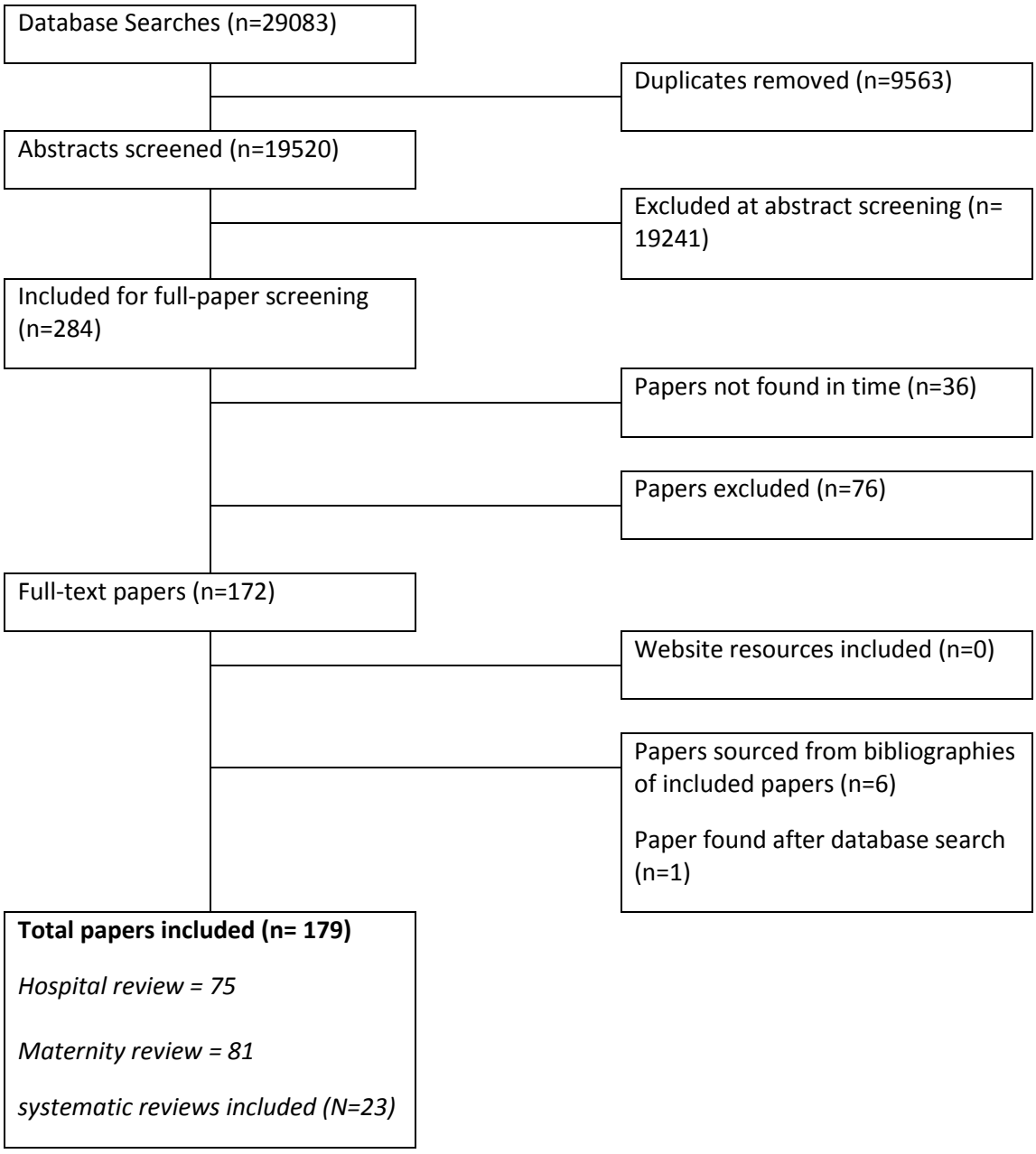
SEARCH METHODOLOGY

We systematically searched reviews and trials published between 1990 and December 2011 in the English language, but we also included literature published in early 2012 while we were working on the review. The searchable databases included ASSIA, MEDLINE, Cochrane Central Register of Controlled Trials, CINAHL and PsychINFO (a full list of the databases searched is included in the review protocol in Appendix 1). Several websites were also searched for relevant data these included NHS Centre for Smoking Cessation and Treatment, Action on Smoking and Health (ASH), Treat tobacco.net and WHO Tobacco Free Initiative (a full list of websites searched is included in Appendix 1). A systematic search of the grey literature was not undertaken but hand searching of bibliographies of systematic reviews that met the inclusion criteria was carried out to ensure that relevant data was included in this review. The search terms included for this review are also in the review protocol in Appendix 1).

SEARCH RESULTS

Searches of the databases returned 29,083 records. After duplicates were removed a total of 19,520 titles and abstracts were screened. Full papers were also obtained where there was no abstract and the relevance could not be assessed by the title alone. One member of the project team screened all titles and abstracts and a second member of the team re-screened 30% to check accuracy. Of the total number of abstracts 267 (1.4%) required review from a third member of the project team as to whether they should be included in the review. A total of 284 papers were identified for full text retrieval. A flow diagram illustrating the screening procedure is included in figure 1 below. Studies excluded at the full-paper screening stage are listed in the appendix 2, along with a brief reason for exclusion.

Figure 1: Flow diagram for papers



CHAPTER ONE

SMOKING CESSATION INTERVENTIONS IN ACUTE SERVICES

INTRODUCTION

Hospitalised smokers are often aware that their illness is related to their smoking. This is the case particularly for smokers with cardiovascular disease, respiratory illness and certain cancers. Being admitted to hospital with a smoking-related problem is likely to increase motivation to quit. The hospital stay also brings smokers into contact with health professionals who can provide further encouragement and help. Apart from routine encouragement and advice by doctors and nurses, many Specialist Stop Smoking Services in the UK employ staff who can provide specialist help and initiate stop-smoking interventions at bedside. In addition to this, UK hospitals are now smoke-free which means that smokers undergo a period of abstinence from smoking, without being exposed to the usual environmental cues and prompts to smoke. Such smokers are also often frightened and focused on their health problem, and so generally cope with tobacco abstinence during their hospital stay well, especially where hospitals provide nicotine replacement to those who need it. All these factors can be expected to encourage smoking cessation and to facilitate engagement in stop-smoking treatment in those who need help.

A large number of studies evaluated a range of stop-smoking interventions trying to use this window of opportunity and they are reviewed in this chapter. It is worth noting at this stage, that there are some problems in generalising the results of the majority of these studies to the UK setting. The NHS is now far ahead of the care for smokers available in most other countries, in that stop smoking medications are provided free of charge and there is also free access to specialist multi session face-to-face counselling. Most of the existing trials were conducted in environments and with methods, which were much less favourable to successful smoking cessation than the current UK routine practice. Nevertheless, the existing literature is extensive and it does provide some useful pointers.

Our brief was to review RCTs evaluating smoking cessation interventions and interventions aimed at facilitating temporary abstinence. We identified a relatively large number of studies seeking to determine the efficacy of smoking cessation interventions delivered to users of acute services, but we did not identify any studies evaluating interventions aimed at facilitating temporary abstinence.

STRUCTURE OF THE CHAPTER

We found 75 studies evaluating smoking cessation interventions with users of acute services which had follow-up periods of at least 6 months. The studies are summarised in Table 2.

Table 2: Summary of studies included in Chapter 1

	Summary
Bolman et al 2002 Netherlands	*Participants:* 789 inpatients recruited from cardiac wards across 11 hospitals *Intervention:* Advice from a cardiologist and 15-30 min nurse counselling on ward. Advice again in the outpatient clinic at 4-6 weeks post discharge. (Intensity 5) *Control procedure:* Usual care *Outcomes:* 12 month sustained abstinence *Validation:* None *Quality:* - *Notes:* Data from 25 deaths, 38 refusals, and 64 people with missing baseline data were excluded from analysis.
Borglykke et al 2008 Denmark	*Participants:* 223 patients hospitalised with COPD *Interventions:* Standard information offered in hospital and group counselling over 5 weeks, NRT offered (Intensity 5) *Control procedure:* Standard information only *Outcomes:* PP at 12m *Validation:* Blood COHb *Quality:* + *Notes:* Blood samples assessed in 84% of patients
Brandt 1997, Denmark	*Participants:* 56 hospitalised COPD patients *Interventions:* Smokers informed they have an illness called 'smokers lung' (Intensity 1) *Control procedure:* Smokers informed they have an illness called chronic bronchitis *Outcomes:* 12 months (not specified) *Validation:* CO *Quality:* +
British Thoracic Society A 1990, UK	*Participants:* 1462 chest outpatients *Interventions:* advice + target quit day discussed, 5 letters and 2 HV contacts (Intensity 5) *Control procedure:* Advice only *Outcomes:* 9 month continuous abstinence

	Validation: Blood COHb *Quality:* ++
British Thoracic Society B 1990, UK	*Participants:* 1392 chest outpatients *Interventions:* (1) advice only; (2) advice + agreement to quit; (3) advice + 6 letters; and (4) advice + agreement + letters *Outcomes:* 6 month continuous abstinence *Validation:* Blood COHb *Quality:* ++ Notes: We merged 1+2 (one-off intervention, Control) and 3+4 (extended contact; Intensity 4) for analysis
Campbell et al 1991, UK	*Participants:* 212 in-patients with smoking-related diseases *Intervention:* Physician advice plus a single session of inpatient counselling and nicotine gum for 3 months. Followed up at 2, 3, 5 weeks, 3 months, and 6 months by counsellor (Intensity 4) *Control procedure:* Same as intervention but with placebo gum *Outcomes:* 12 month sustained abstinence *Validation:* CO *Quality:* ++
Campbell et al 1996, UK	*Participants:* 62 Inpatients with respiratory or cardiovascular disease *Intervention:* Physician advice plus a single session of inpatient counselling and nicotine patch for 3 months. Outpatient follow-up by counsellor at 2, 4, 8, and 12 weeks (Intensity 4) *Control procedure:* Same as intervention but with placebo patch *Outcomes:* 12 months sustained abstinence *Validation:* CO *Quality:* ++
Carlsson 1997, Sweden	*Participants:* 168 MI patients, intervention after discharge *Interventions:* CVD prevention programme with exercise, diet and stop-smoking advice (Intensity 5) *Control procedure:* Usual care via GP *Outcomes:* Abstinence from smoking at 1 year (not defined) *Validation:* none *Quality:* -
Caruthers 2005, USA	*Participants:* 80 smokers after discharge from hospital

	Interventions: 8 phone calls, some used medications (Intensity 4) *Control procedure:* Usual care *Outcomes:* 6 month PP *Validation:* CO validated *Quality:* + *Notes:* Unpublished PhD thesis. Controls for baseline differences not clear.
Chan et al 2005, Hong Kong	*Participants:* 80 smoking parents of sick children brought to hospital *Interventions:* Motivational interviewing and telephone reminders 1 week after intervention (Intensity 3) *Control procedure:* Healthy diet counselling *Outcomes:* 1 month PP *Validation:* None *Quality:* - Note: Intervention with parents of patients
Chouinard et al 2005, Canada	*Participants:* 168 inpatients with CVD or PVD *Interventions:* (a) Single session of inpatient nurse counselling plus pharmacotherapy (nicotine patches, gum and bupropion). (Intensity 2); (b) Same as intervention (a), but with 6 follow-up telephone calls over 2 months post discharge (Intensity 4) *Control procedure:* Cessation advice *Outcomes:* 6 month sustained abstinence *Validation:* Urine cotinine or CO *Quality:* ++ *Notes:* 23% used pharmacotherapy.
Croghan et al 2005, USA	*Participants:* 30 smokers undergoing surgical resection of lung or oesophageal cancers *Intervention:* Advice from surgeons and study nurses and a single session of inpatient counselling (Intensity 2) *Control procedure:* Physician advice only *Outcomes:* 6 months 7-day PP *Validation:* CO or saliva tobacco alkaloid *Quality:* +
Dalsgaro et al 2004, Denmark	*Participants:* 336 hospital employees *Interventions:* 5 counselling sessions, 2 phone calls over 6 months, and 7 weeks Bupropion. (Intensity 5)

	Control procedure: Identical support + 7 weeks placebo *Outcomes:* 6 month continuous abstinence *Validation:* CO validated *Quality:* ++ Notes: Hospital employees, not patients
De Busk et al 1994, USA	*Participants:* 252 inpatients with acute MI *Intervention:* Physician advice plus single session of counselling and NRT. Self help materials and relaxation tapes were also provided. Follow-up at 48hrs, 1 weeks and then monthly for 6-months via telephone (Intensity 4) *Control procedure:* Advice only *Outcomes:* 12 months sustained abstinence *Validation:* CO and plasma cotinine. *Quality:* ++ *Notes:* NRT was provided to only the 'highly-addicted' patients. Intervention post-discharge.
Dornelas et al 2000, USA	*Participants:* 100 smokers Inpatients with acute MI. *Intervention:* Single inpatient counselling session followed by telephone calls at weeks 1, 4, 8, 12, 16, 20, and 26 (Intensity 4) *Control procedure:* Advice only *Outcomes:* 12 month PP *Validation:* Significant other *Quality:* - Note: Validation available for only 70% of cases
Feeney et al 2001, Australia,	*Participants:* 198 inpatients with acute MI *Intervention:* Physician advice to quit plus single session of nurse counselling. Outpatient telephone follow up at 1,2,3,4 weeks and 2,3,6,12 months (Intensity 4) *Control procedure:* Same as above but no proactive follow-up contact *Outcomes:* 12 month sustained abstinence *Validation:* Urinary cotinine *Quality:* ++
Froelicher et al 2004 USA	*Participants:* 277 inpatients with CVD or PVD from across 10 hospitals *Intervention:* Physician advice plus single session of nurse counselling. Then outpatient telephone follow-up at 2,7,21,28,90 days (Intensity 4)

	Control procedure: Physician advice + booklet *Outcomes:* 12 months 7-day PP *Validation:* Saliva cotinine OR verification by significant other *Quality:* +
Hajek et al 2002, UK	*Participants:* 540 inpatients with acute MI. *Intervention:* Nurse advice and single session of inpatient counselling with self-help materials (Intensity 2) *Control procedure:* Brief intervention (Intensity 1 and 2) and booklet *Outcomes:* 12 months continuous abstinence *Validation:* CO and salivary cotinine. *Quality:* ++
Hand et al 2002, UK	*Participants:* 245 hospital in-patients and outpatients with smoking related diseases *Interventions:* Advice and support + 3 weeks use of nicotine patch and nicotine inhalator (Intensity 5) *Control procedure:* Advice and support only *Outcomes:* 1 year continuous abstinence *Validation:* CO validated *Quality:* ++
Hanssen et al 2009, Norway	*Participants:* 288 MI patients *Interventions:* pro-active telephone follow-up included smoking cessation advice (8 calls in 6 months + access to reactive line) (Intensity 4) *Control procedure:* No intervention *Outcomes:* 18 month (not defined if PP or continuous abstinence) *Validation:* None *Quality:* - *Notes:* 7 died in each group. Intervention was provided post-discharge
Hasuo et al 2004, Japan	*Participants:* 120 inpatients with any diagnosis *Intervention:* 3 sessions of inpatient nurse counselling and then telephone follow up at 7, 21, 42 days (Intensity 4) *Control procedure:* Same as above, but no follow-up calls (intensity 2) *Outcomes:* 12 months – not defined *Validation:* urinary cotinine (not clear if results are self-report or cotinine validated) *Quality:* -

Haug et al 2011, Germany	*Participants:* 477 patients in a rehabilitation centre (following acute medical illnesses) *Interventions:* Internet based smoking cessation intervention + 6 post discharge email invites to log on (Intensity 4) *Control procedure:* Baseline smoking assessment only *Outcomes:* 6 month PP *Validation:* None *Quality:* -
Hennrikus et al 2005, USA	*Participants:* 2095 inpatients (all diagnoses) from across 4 hospitals *Interventions:* (1) Physician advice and smoking cessation booklet with an additional booklet mailed after discharge (Intensity 1); (2) Physician advice plus single session of inpatient nurse counselling followed by 3-6 telephone calls over 6 months (Intensity 4) *Control procedure:* Smoking cessation booklet in hospital *Outcomes:* 12 month 7-day PP *Validation:* Saliva cotinine *Quality:* + *Notes:* 43% of counselling sessions in intervention 2 were conducted after discharge by telephone rather than at bedside
Hennrikus et al 2010, USA	*Participants:* 124 outpatients with peripheral arterial disease *Interventions:* minimum of 6 counselling sessions over 5 months + pharmacotherapy (a choice of NRT, bupropion or varenicline) (Intensity 5) *Control procedure:* Brief intervention (Intensity 1 and 2) and information about smoking cessation services *Outcomes:* 6 month PP *Validation:* CO validated or salivary cotinine *Quality:* +
Hilleman et al 2004, USA	*Participants:* 39 smokers who had recently undergone CABG *Interventions:* referred immediately to smoking cessation service for 8 week course + NRT (Intensity 5) *Control procedure:* Called monthly and if reported smoking then referred onto 8 week course *Outcomes:* 12 month continuous abstinence *Validation:* CO validated *Quality:* ++
Horn et al 2008, USA	*Participants:* 75 teenage smokers *Interventions:* In-hospital counselling, audio workbook, personalised postcard sent after

	discharge and 3 FU calls (1, 3 and 6 months) (Intensity 4) *Control procedure:* Basic advice *Outcomes:* 6 month – asked, "did you smoke in the last month?" *Validation:* None *Quality:* -
Kim 2005, South Korea	*Participants:* 401 general outpatients *Interventions:* Nurse advice, stage matching, setting TQD, booklets, mailed reminders, phone calls at 1 week and 1 month (Intensity 3) *Control procedure:* Usual care *Outcomes:* Abstinence from smoking at 5 months ('since the last quit attempt') *Validation:* CO *Quality:* +
Lacasse et al 2008, Canada	*Participants:* 196 patients on cardio-pulmonary wards *Interventions:* Psychological support and NRT + up to 4 phone calls within 6 weeks post discharge (Intensity 4) *Control procedure:* Usual care *Outcomes:* 1 year PP *Validation:* Urine cotinine, but not taken into account *Quality:* -
Lewis 2009, UK	*Participants:* 450 hospitalised smoker *Interventions:* (1) counselling + 4 weekly out-patients appointments and information about stop smoking services (Intensity 4); (2) as above but given an appointment at the stop smoking service (Intensity 5). Patients were recommended to use NRT or bupropion. *Control procedure:* brief intervention (Intensity 1 and 2) *Outcomes:* 1 year PP *Validation:* CO validated *Quality:* +
Lewis et al 1998, USA	*Participants:* 185 inpatients with any diagnosis except certain cardiac conditions *Interventions:* (1) Physician advice, a single session of counselling, nicotine patch for 6 weeks and self-help materials. Follow-up telephone calls at 1,3,6 weeks and 6 months. [Intensity 4]; (2) As above but with placebo patch (Intensity 4) *Control procedure:* Advice only *Outcomes:* 6 month PP

	Validation: CO *Quality:* +
Li et al 2008 USA	*Participants:* 277 female smokers hospitalized with CVD *Interventions:* Inpatient counselling + 5 follow up phone calls over 3 months (Intensity 4) *Control procedure:* Usual care *Outcomes:* 30 month PP *Validation:* None *Quality:* -
Lindström et al 2008, Sweden	*Participants:* 117 smokers undergoing elective surgery *Interventions:* Weekly sessions, face-to-face or by telephone and NRT, 4 week pre and post surgery (Intensity 5) *Control procedure:* Usual care *Outcomes:* Abstinence from 3 weeks pre to 4 weeks post surgery *Validation:* CO validation *Quality:* ++
Mahabee-Gittens et al 2008, USA	*Participants:* 365 smoking parents of paediatric patients admitted to the emergency department. *Interventions:* Brief intervention + fax referral to a quitline (Intensity 1) *Control procedure:* Usual care *Outcomes:* 3 month PP *Validation:* None *Quality:* - *Notes:* Parents of patients
Martucci et al 2010 Italy	*Participants:* 233 smokers undergoing bronchoscopy *Interventions:* 15 minutes advice before and after surgery. Pharmacotherapy suggested but only prescribed on demand (Intensity 2) *Control procedure:* Usual care *Outcomes:* 12 month PP *Validation:* CO validation *Quality:* +
Metz et al 2007, Germany	*Participants:* 307 smokers at a rehabilitation centre for acute and chronic disorders *Interventions:* CBT or Motivational Treatment in hospital + 5 telephone booster sessions

	(Intensity 4) *Control procedure:* CBT or Motivational Treatment in hospital + usual care *Outcomes:* 12 month PP *Validation:* None *Quality:* -
Miller et al 1997, USA	*Participants:* 1942 general hospital inpatients *Interventions:* (1) Physician advice, single inpatient counselling session and self help materials. Telephone follow-up at 48 hours, 1, 3, and 12 weeks (Intensity 4); (2) As above by only one follow-up call (at 48 hours) (Intensity 3). *Control procedure:* Advice only *Outcomes:* 12 month sustained abstinence *Validation:* Plasma cotinine or family member corroboration *Quality:* +
Mohiuddin et al 2007, USA	*Participants:* 209 in-patients with acute coronary syndrome or decompensated CHF *Intervention:* Single session of inpatient counselling, self-help booklet, and NRT and/or bupropion. Outpatient follow-up consisted of weekly group meetings for up to 3m. (Intensity 5) *Control procedure:* Same as intervention but without any follow up (Intensity 2) *Outcomes:* 12 months sustained abstinence *Validation:* CO *Quality:* ++ *Notes:* NRT or bupropion offered on individualized basis to both groups
Moller et al 2002, Denmark	*Participants:* 120 smokers undergoing surgery *Intervention:* Weekly counselling initiated 6-8 week pre-operatively with NRT (type not specified). Abstinence or reduction option. (Intensity 5) *Control procedure:* Usual care *Outcomes:* 12 month sustained abstinence *Validation:* CO validation *Quality:* ++
Molyneux et al 2003, UK	*Participants:* 274 medical and surgical inpatients *Interventions:* (1) brief counselling plus a self-help booklet, no NRT and no follow up (Intensity 2); (2) brief counselling plus a self-help booklet and an offer of 6-week supply of NRT. No follow up (Intensity 2) *Control procedure:* Usual care

	Outcomes: 12 months sustained *Validation:* CO *Quality:* ++ *Notes:* NRT offered= gum, patch, inhalator, lozenge, nasal spray; 96% used NRT
Mosca et al 2010, USA	*Participants:* 304 admitted to hospital with CHD *Interventions:* Counselling during hospital + 3 FU calls (2, 4, 12 weeks) and a final visit/call at 6 weeks post discharge (Intensity 4) *Control procedure:* Usual care *Outcomes:* 6 month (not defined) *Validation:* CO validated *Quality:* +
Nagle et al 2005, Australia	*Participants:* 1422 inpatients (all diagnoses, but those in ICU were excluded) *Intervention:* Two sessions of inpatient nurse counselling plus a booklet and offer of NRT in hospital and for 5 days post-discharge. There was no follow-up (Intensity 2) *Control procedure:* Physician advice and booklet *Outcomes:* 12 months 7-day PP *Validation:* Saliva cotinine *Quality:* +
Neuner et al 2009, Germany	*Participants:* 1044 smokers at an emergency department *Interventions:* in-hospital counselling + telephone booster sessions (nicotine gum given to those who set a TQD) (Intensity 3) *Control procedure:* Usual care *Outcomes:* 12 month PP *Validation:* None *Quality:* -
Ortigosa *et al* 2000, Spain	*Participants:* 90 Inpatients with acute MI *Intervention:* Physician advice with telephone follow up at 2,3 and 4 weeks (Intensity 3) *Control procedure:* Usual care *Outcomes:* 12 month PP *Validation:* CO *Quality:* +
Papadakis et al 2011,	*Participants:* 28 patients at stroke prevention clinic *Interventions:* Breif counselling from a nurse specialist plus 4 weeks supply of free

Canada	smoking cessation medication (a choice of NRT, bupropion or varenicline) + a prescription for further supply (Intensity 1) *Control procedure:* Prescription only *Outcomes:* 6 month PP *Validation:* CO validated *Quality:* +
Pedersen *et al* 2005, Denmark	*Participants:* 105 inpatients with CHD *Intervention:* Advice to quit plus information about NRT (NRT was available). Patients attended 5 outpatient visits post discharge (Intensity 5) *Control procedure:* As above, but without follow-up *Outcomes:* 12 month PP *Validation:* None *Quality:* -
Pederson *et al* 1991, USA	*Participants:* 74 inpatients with COPD. *Intervention:* Physician advice (prior to admission), followed by 3-9 sessions of inpatient counselling and self help materials, but no outpatient follow-up (Intensity 2) *Control procedure:* Advice only *Outcomes:* 6 month PP *Validation:* Serum COHb *Quality:* + *Notes:* Only a subset validated
Pelletier *et al* 1998, Canada	*Participants:* 504 inpatients with acute MI. *Intervention:* Physician advice and self-help materials (Intensity 2) *Control procedure:* Usual care *Outcomes:* 12 months PP *Validation:* None *Quality:* - *Note:* Not fully randomised
Quist-Paulsen *et al* 2003, Norway	*Participants:* 240 inpatients admitted to a cardiac ward *Intervention:* 1-2 sessions of inpatient nurse counselling and advice on using NRT. Telephone follow up at 2,7 and 21 days and 3 and 5 months, with a clinic visit with a cardiac nurse at 6 weeks (Intensity 4) *Control procedure:* Advice to quit and self-help booklet

	Outcomes: 12 months PP *Validation:* Urine cotinine *Quality:* + *Notes:* Nicotine gum or patch encouraged for patients with strong urges to smoke in hospital
Ralston *et al* 2008, USA	*Participants:* 42 smoking caregivers of children admitted to hospital for respiratory illness *Interventions:* Counselling >30 minutes and offered NRT (Intensity 2) *Control procedure:* Brief counselling *Outcomes:* 6 month (not defined) *Validation:* None *Quality:* -
Ratner et al 2004, Canada	*Participants:* 237 patients awaiting surgery *Interventions:* Face-to-face counselling 1-3 weeks pre surgery and written materials, nicotine gum and smoking cessation hotline number. Post surgery counselling in hospital and via telephone (Intensity 4) *Control procedure:* Usual care *Outcomes:* Abstinence at 12 month (no definition provided) *Validation:* CO validation or urine cotinine *Quality:* +
Reid et al 2003 Canada	*Participants:* 254 inpatients admitted with CVD *Intervention:* A single session of brief nurse counselling followed by telephone call at 4 weeks. If patients were smoking at this time they were offered 3 counselling sessions (weeks 4, 8 and 12) and nicotine patch for 8 weeks (Intensity 4) *Control procedure:* Same as above, but without outpatient follow-up. *Outcomes:* 12 month 7-day PP *Validation:* CO validation in a random sample of 25 self-reported abstainers *Quality:* +
Reid et al 2007 Canada	*Participants:* 99 hospitalised smokers with CAD *Interventions:* Counselling in hospital and offer of NRT + interactive voice response follow up (contact patients at 3,14 and 30 days post discharge) (Intensity 4) *Control procedure:* Counselling in hospital and offer of NRT + usual care *Outcomes:* 12 month PP *Validation:* None

	Quality: -
Rigotti *et al* 1997 USA	*Participants:* 615 inpatients in medical or surgical services. *Intervention:* Physician advice and a single session of inpatient counselling plus self-help materials. Telephone follow-up was provided weekly for 3 weeks post discharge. (Intensity 3) *Control procedure:* Usual care *Outcomes:* 6 month PP *Validation:* Salivary cotinine. *Quality:* +
Rigotti *et al* 1994 USA	*Participants:* 87 inpatients scheduled for CABG surgery *Intervention:* 3 inpatient counselling sessions, plus self-help material, followed by one telephone call 1 week post discharge (Intensity 3) *Control procedure:* Advice only *Outcomes:* 12 month sustained abstinence *Validation:* Salivary cotinine. *Quality:* ++
Rigotti *et al* 2006 USA	*Participants:* 254 inpatients with CVD or PVD from across 5 hospitals *Intervention:* Bupropion 150 mg b.d. for 12 weeks plus a single session of nurse counselling in hospital. Patients were also given a self-help booklet and received 5 follow up phone calls at 2,7,21 days, and 2 and 3 months (Intensity 4) *Control procedure:* Same as above but with placebo *Outcomes:* 12 months continuous abstinence *Validation:* Saliva cotinine *Quality:* ++
Rodriguez et al 2007 *USA*	*Participants:* 111 smokers undergoing deep sedation (for incision and drainage of abscess, or orthopaedic reduction or relocation) *Interventions:* 30 minutes of music played during sedation + scripted smoking-cessation message (Intensity NA) *Control procedure:* Music only *Outcomes:* 2 week sustained abstinence *Validation:* Self report *Quality:* - *Notes:* Study was stopped due to lack of effect
Rosal et al 1992,	*Participants:* 267 inpatients (smokers or recent quitters) with coronary artery stenosis.

USA	*Intervention:* 2 sessions of inpatient counselling, plus self help materials and relaxation tapes. Telephone follow up at 1, 3 weeks and 3 months if quit, or 2 and 4 months if did not quit (Intensity 4) *Control procedure:* Advice only *Outcomes:* 12 months sustained abstinence *Validation:* CO *Quality:* ++
Schiebel et al 2007 USA	*Participants:* 39 smokers at an emergency department *Interventions:* Advice to quit + proactive quitline intervention (baseline session + 4 FU calls around TQD) (Intensity 3) *Control procedure:* Advice to quit + self help manual *Outcomes:* 6 month PP *Validation:* None *Quality:* -
Schofield et al 1999, Australia	*Participants:* 4158 hospitalised smokers *Interventions:* Personalised letter urging them to quit from physician, sent 1-2 weeks post discharge (Intensity 1) *Control procedure:* Usual care *Outcomes:* 12 month PP *Validation:* Urine cotinine or CO validated *Quality:* +
Simon *et al* 2003, USA	*Participants:* 223 inpatients (all diagnoses) *Intervention:* A single session of nurse or health educator counselling and booklet, plus nicotine patch treatment for 8 weeks. Telephone follow-up conducted at 1 and 3 weeks and 1, 2, and 3 months (Intensity 4) *Control procedure:* A single session of nurse or health educator counselling and booklet, plus nicotine patch treatment for 8 weeks but no telephone contact *Outcomes:* 12 months 7-day PP *Validation:* Saliva cotinine OR report by spouse *Quality:* +
Simon et al 2009, USA	*Participants:* 85 smokers admitted to hospital for at least 24 hours *Interventions:* counselling and 5 FU calls +7 weeks Bupropion (Intensity 4) *Control procedure:* counselling and 5 FU calls + 7 weeks placebo

	Outcomes: 6 month PP *Validation:* Salivary cotinine *Quality:* +
Simon et al 1997, USA	*Participants:* 229 smokers undergoing non-cardiac surgery *Intervention:* Inpatient counselling (30-60 mins), self-help materials, video and nicotine gum (3mg) if no contraindications. Telephone FU 5 times in 1-3 weeks post discharge, 2m and 3m (Intensity 4) *Control procedure:* Advice only *Outcomes:* 12 month PP *Validation:* CO or corroboration by significant other *Quality:* -
Sivarajan et al 2004, USA	*Participants:* 277 women hospitalized with CVD *Interventions:* Counselling at bedside, tapes and booklets + 5 FU calls (Intensity 4) *Control procedure:* Usual care *Outcomes:* 30 month PP *Validation:* None *Quality:* -
Smith et al 2009, Canada	*Participants:* 276 patients admitted with MI or for a CABG *Interventions:* Counselling, take home materials + 7 FU calls over 2 months post discharge (Intensity 4) *Control procedure:* Advice from doctor/nurse + 2 pamphlets *Outcomes:* 12 month PP *Validation:* None *Quality:* -
Smith et al 2011, Canada	*Participants:* 643 inpatients *Interventions:* In-hospital education + multiple FU calls (up to 60 days post discharge) (Intensity 4) *Control procedure:* Brief in-hospital advice + pamphlets *Outcomes:* 12 month PP *Validation:* Salivary cotinine *Quality:* +
Steinberg et al 2011, USA	*Participants:* 79 hospitalised smokers *Interventions:* Brief behavioural support (5-10 mins) + varenicline. Data collection visits

	at 4, 12 and 24 weeks (Intensity 5) *Control procedure:* Support + placebo *Outcomes:* abstinent at all time points 4, 12, 24 weeks PP *Validation:* CO validated *Quality:* +
Stevens *et al* 1993, USA	*Participants:* 1119 general hospital inpatients admitted for >36 hours *Intervention:* Single session of inpatient counselling supplemented by self-help materials. 1-2 telephone contacts were provided in the first 3 weeks of discharge (Intensity 3) *Control procedure:* Usual care *Outcomes:* 12 month sustained abstinence *Validation:* None *Quality:* -
Stevens *et al* 2000, USA	*Participants:* 1173 general hospital inpatients admitted for >36 hours *Intervention:* Single session of counselling supplemented by self-help materials, video. Follow up consisted of 1 telephone call at 1-week post discharge (Intensity 3) *Control procedure:* Usual care *Outcomes:* 12 month sustained abstinence *Validation:* None *Quality:* -
Taylor *et al* 1990, USA	*Participants:* 173 inpatients with acute MI. *Intervention:* A single session of inpatient counselling supplemented by self-help materials and relaxation tapes. Nicotine gum was available. 6-7 telephone follow-up calls were undertaken over 4 months post discharge (Intensity 4) *Control procedure:* Usual care *Outcomes:* 12 month sustained abstinence *Validation:* Serum thiocyanate and CO *Quality:* +
Taylor et al 1996, USA	*Participants:* 328 hospitalised smokers *Interventions:* 1 hour in-hospital counselling session + 4 FU calls after discharge (Intensity 4) *Control procedure:* Brief intervention (Intensity 1 and 2) *Outcomes:* 1 year PP *Validation:* plasma cotinine or family confirmation

	Quality: +
Thomsen et al 2010, Denmark	*Participants:* 130 female smokers undergoing breast cancer surgery *Interventions:* Single smoking cessation counselling session and NRT, 3-7 days pre surgery (Intensity 3) *Control procedure:* Usual care *Outcomes:* 12 month continuous *Validation:* None *Quality:* +
Tonnesen et al 2000, Denmark	*Participants:* 446 smokers referred to a lung clinic *Interventions:* 1) 15mg patch 2) nicotine inhaler 3) 15mg patch + inhaler for 3 months (Intensity 4) *Control procedure:* 5mg patch "placebo" for 3 months *Outcomes:* 12 month continuous abstinence *Validation:* Salivary cotinine *Quality:* ++
Tonnesen et al 2006, Denmark	*Participants:* 370 COPD patients *Interventions:* 12 week course of nicotine sublingual tablets with low (4 visits + 6 phone calls) or high (7 visits + 5 phone calls) intensity support (Intensity 5 for both) *Control procedure:* 12 week course of placebo sublingual tablets with low (4 visits + 6 phone calls) or high (7 visits + 5 phone calls) intensity support *Outcomes:* 1 year continuous abstinence *Validation:* CO validated *Quality:* ++
Vial *et al* 2002, Australia	*Participants:* 102 inpatients from medical and surgical wards *Interventions:* (1) Pharmacist consultation about NRT use, supplemented by a booklet and up to 16 weeks of subsidized nicotine patches that could be obtained at weekly visits to the hospital pharmacist; (2) As above, but patches were obtained from a community pharmacists (Intensity 5) *Control procedure:* advice to quit plus a booklet *Outcomes:* 12 month sustained abstinence *Validation:* CO test 'whenever possible' *Quality:* -
Wakefield et al 2004, Australia	*Participants:* 137 cancer patients *Interventions:* Motivational intervention and a FU call (Intensity 4)

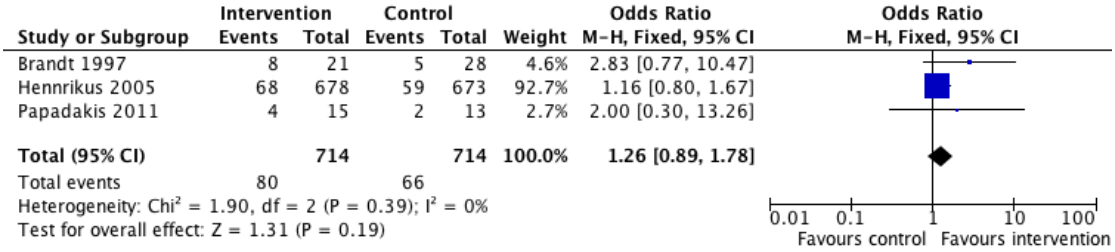
	Control procedure: Usual care *Outcomes:* 6 month continuous abstinence *Validation:* Urine cotinine or CO validated *Quality:* ++
Wiggers et al 2006, Netherlands	*Participants:* 385 smokers at outpatient departments (vascular surgery, cardiology and vascular medicine) *Interventions:* counselling, 8 weeks nicotine patches + a FU call (Intensity 3) *Control procedure:* Usual care *Outcomes:* 12 month PP *Validation:* Urine or Salivary cotinine *Quality:* +

SECTION 1: EFFICACY OF INTERVENTIONS DELIVERED TO NON-SURGERY PATIENTS

PART 1: INTERVENTION INTENSITY

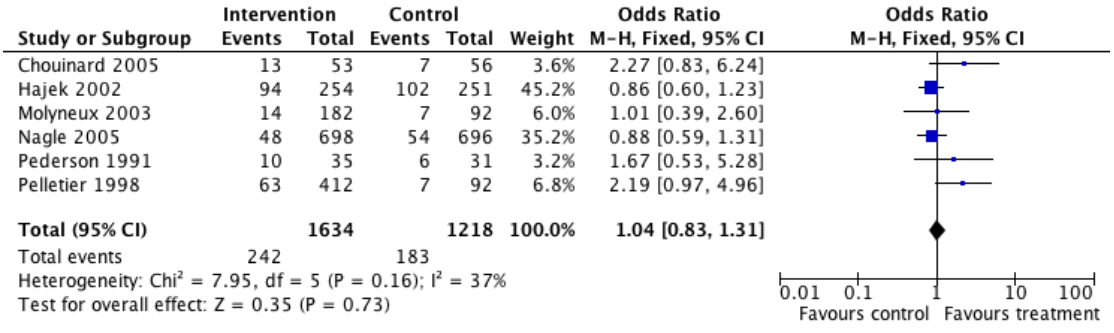
Below we analyse all studies where more intensive support was compared with less intensive or no support. Drug trials where both study arms received the same intensity of behavioural support are analysed in Section 3.

Intensity 1 (Single contact in hospital lasting up to 15 minutes, no follow-up support)



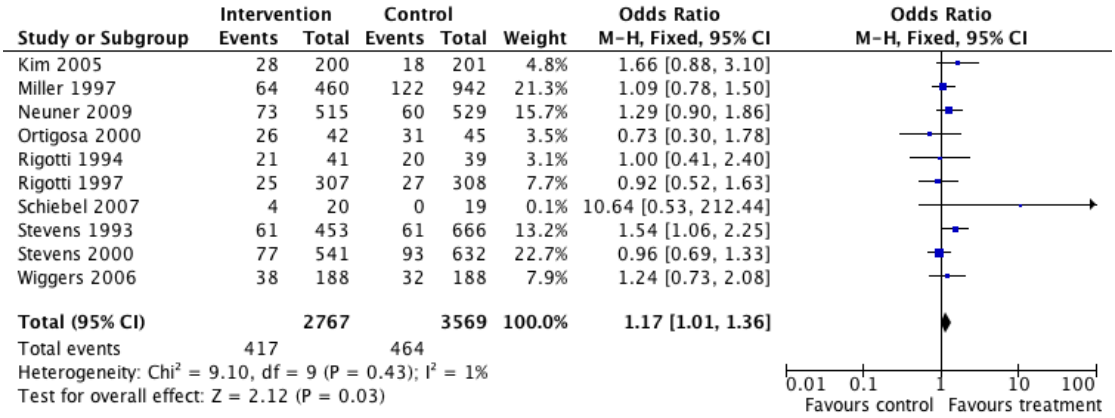
Three studies reported on the effects of one-off brief interventions (Intensity 1 and 2) with no follow-up. The results were homogenous and show no additional effect of such interventions compared to usual care.

Intensity 2 (One or more contacts in hospital lasting in total > 15 minutes, no follow-up support)



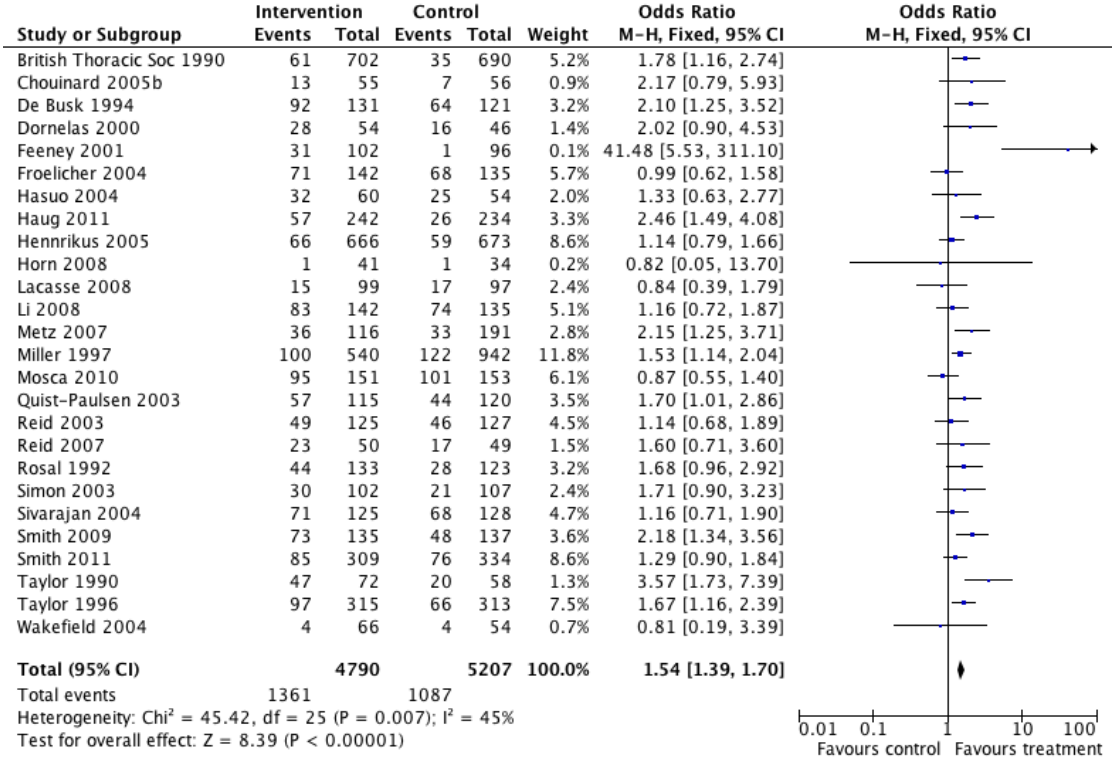
The results from six studies which reported slightly more intensive interventions in hospital (a longer counselling session or two and booklets) with no further follow up were similar, showing no effect of such interventions. The results were again homogenous.

Intensity 3 (Any hospital contact plus follow-up <=1 month)



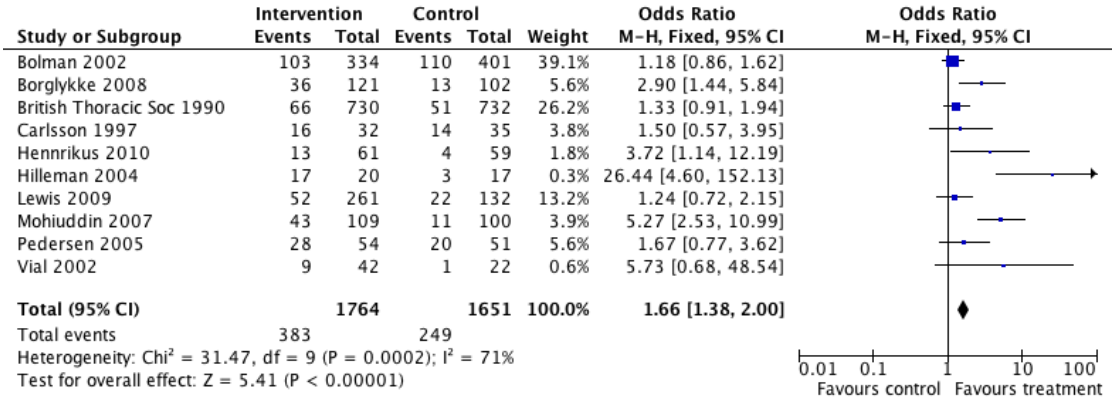
Ten studies provided telephone support post-discharge for up to 4 weeks. This also did not generate a significant effect overall. The studies are homogenous. Only one study (Stevens et al 1993, [RCT -]) yielded a significant result. If there is an effect, it is likely to be small.

Intensity 4



The largest number of trials (26) included telephone follow-ups for over 4 weeks. Such interventions are effective. The studies were heterogeneous, with two outliers (Feeney et al 2001, [RCT ++]; Taylor et al 1996, [RCT +]). Removing them reduced the heterogeneity (p=0.06) with the result remaining significant (OR=1.48, 1.33-1.64).

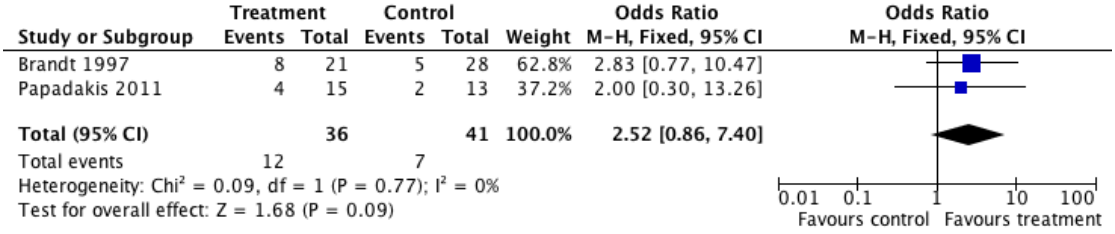
Intensity 5 (Any hospital contact plus follow-up >1 month including at least one face-to-face session)



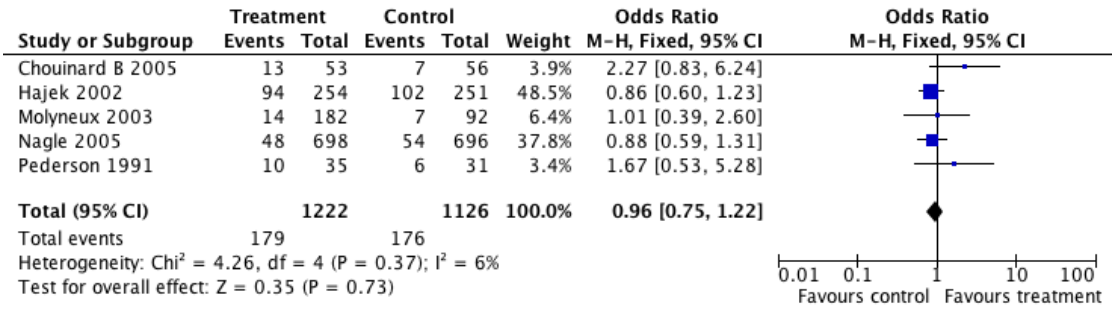
Ten studies included at least one post-discharge face-to-face contact. They differed widely in the number of sessions and the nature of support provided. There were also substantial differences in the nature of the control interventions, which ranged from minimal to Intensity 5. There was an overall significant effect, but the studies were heterogeneous. Removing the two outliers, which both provided intensive face-to-face treatment over extended periods of time (Hilleman et al 2004, [RCT ++]; Mohiuddin et al 2007, [RCT ++]) reduced heterogeneity (p=0.19). The overall effect was reduced as well but it remained significant (OR=1.45, 1.19-1.76).

We next re-ran the five analyses including only studies which validated self-reported abstinence.

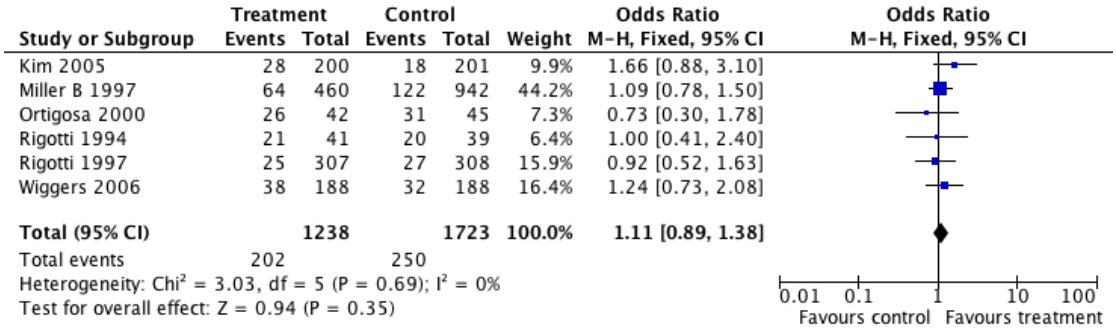
Validated studies of intensity 1



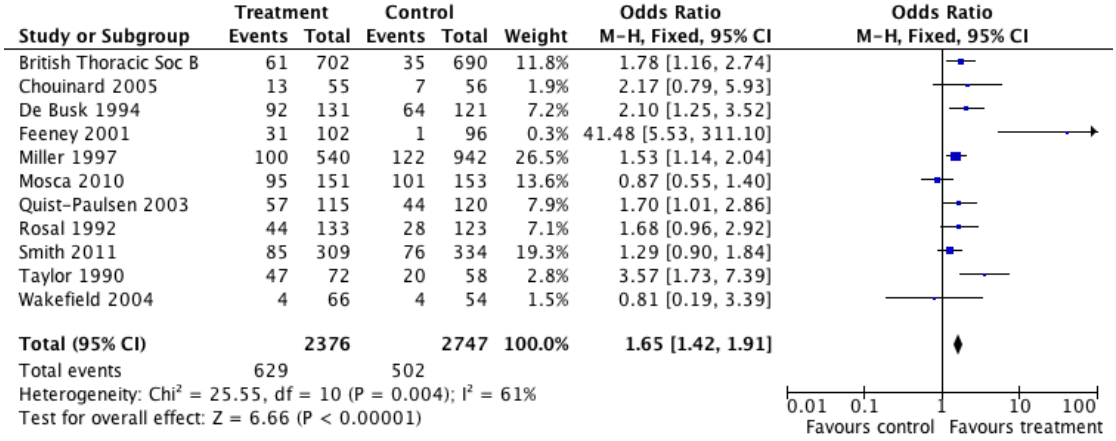
Validated studies of intensity 2



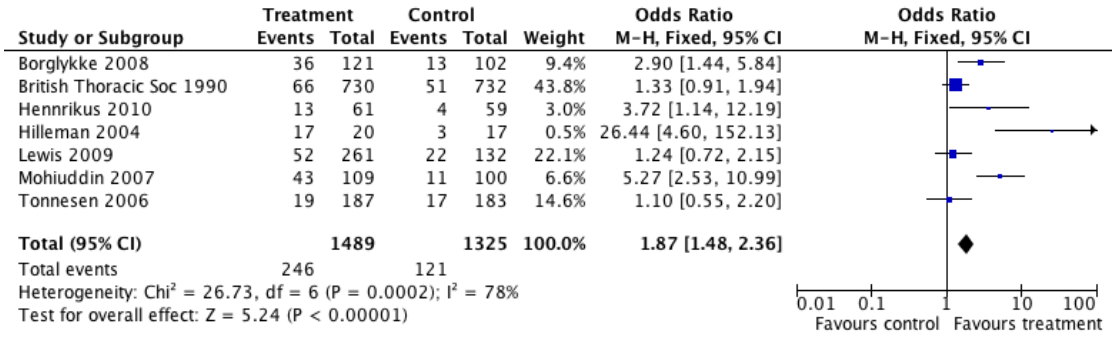
Validated studies of intensity 3



Validated studies of intensity 4



Validated studies of intensity 5

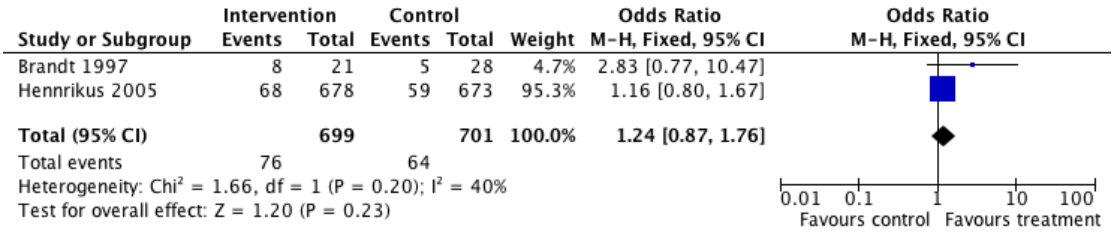


The results remain unaltered, showing a lack of efficacy for low intensity interventions, and significant effects of interventions providing follow-up support for the duration longer than four-weeks. They thus agree with the finding by Rigotti et al. (2007 [Systematic Review ++]).

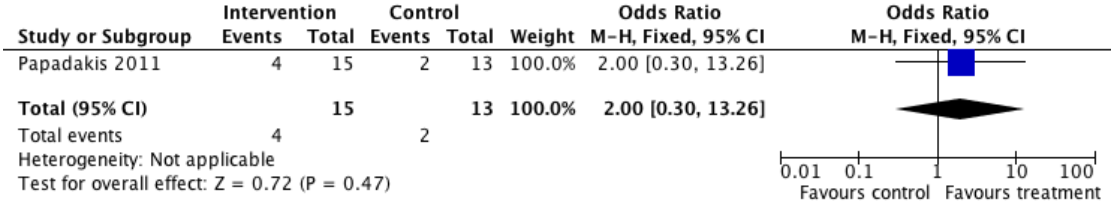
The next key question, not addressed in the previous meta-analyses, concerns the role of stop smoking medications. Some of the interventions examined in these studies included medications and some did not. The analyses presented above do not clarify whether significant effects can be achieved without medications, and whether the finding of differential effectiveness of interventions of different intensity is confounded by more intensive interventions being more likely to include pharmacotherapy. Clarifying this issue has obvious implications for recommended practice and for intervention costs.

We divided studies of each intensity into those which included medications and those that did not. The relevant meta-analyses are presented below. Medication was mostly NRT.

Intensity 1 – behavioural support only



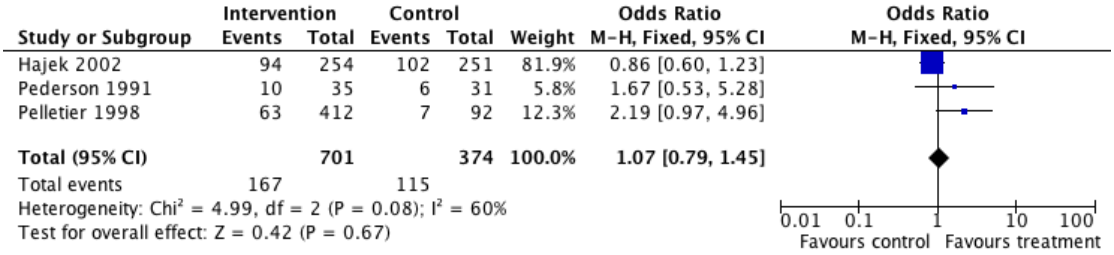
Intensity 1 – behavioural support plus medications



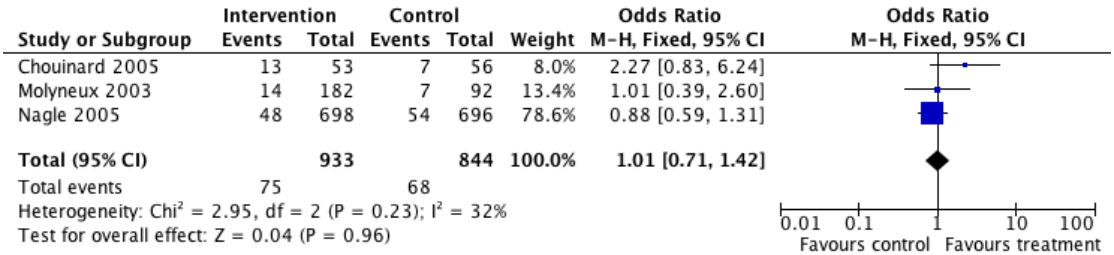
The study allowed a choice of NRT, bupropion or varenicline.

Intensity 1 interventions are ineffective with or without medications.

Intensity 2 – behavioural support only



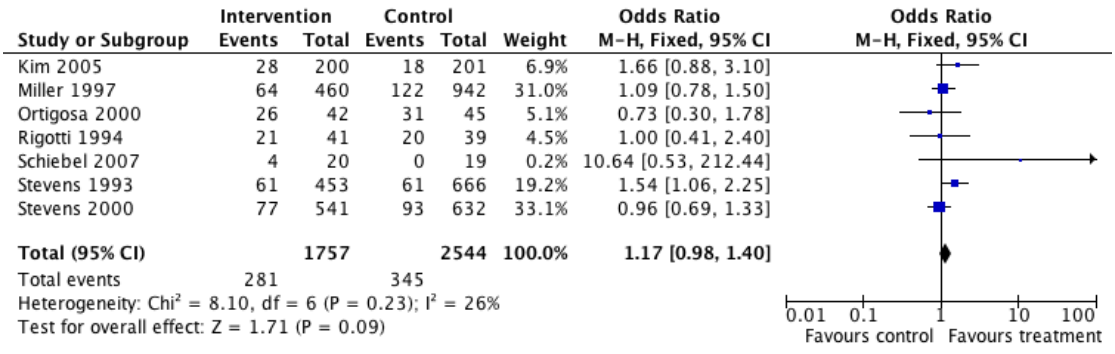
Intensity 2 – behavioural support plus medications



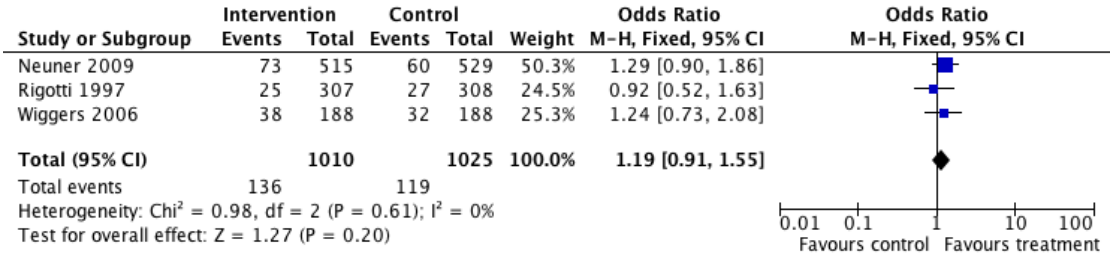
All studies used NRT.

Intensity 2 interventions are ineffective with or without medications.

Intensity 3 – behavioural support only



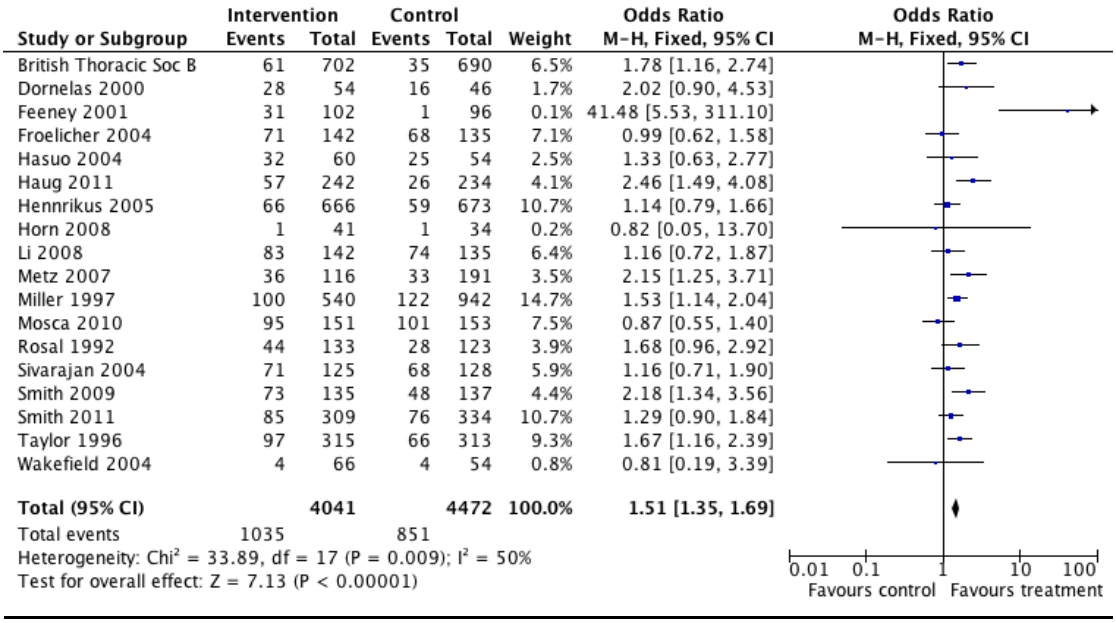
Intensity 3 – behavioural support plus medications



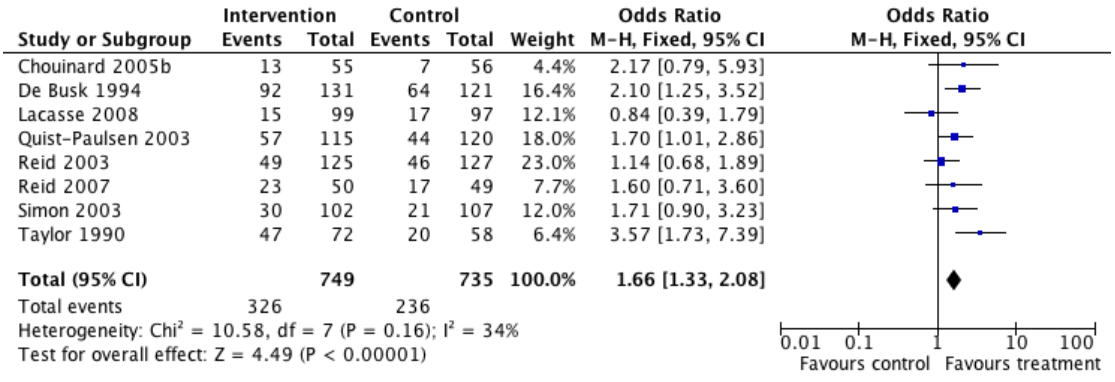
All three studies used NRT.

Intensity 3 interventions are ineffective with or without medications. The results are homogenous.

Intensity 4 – behavioural support only



Intensity 4 – behavioural support plus medications

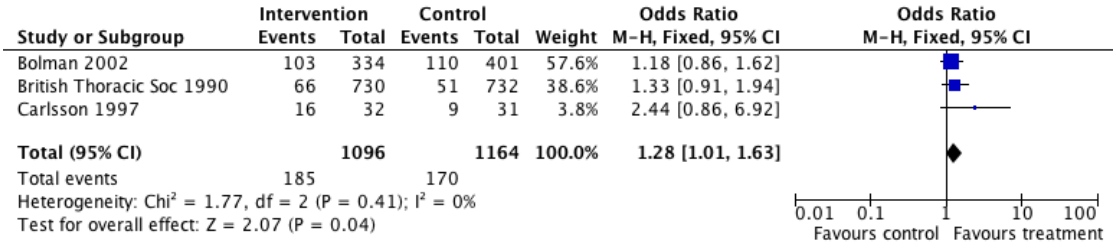


All studies used NRT. Chouinard et al 2005 [RCT ++] included bupropion as well.

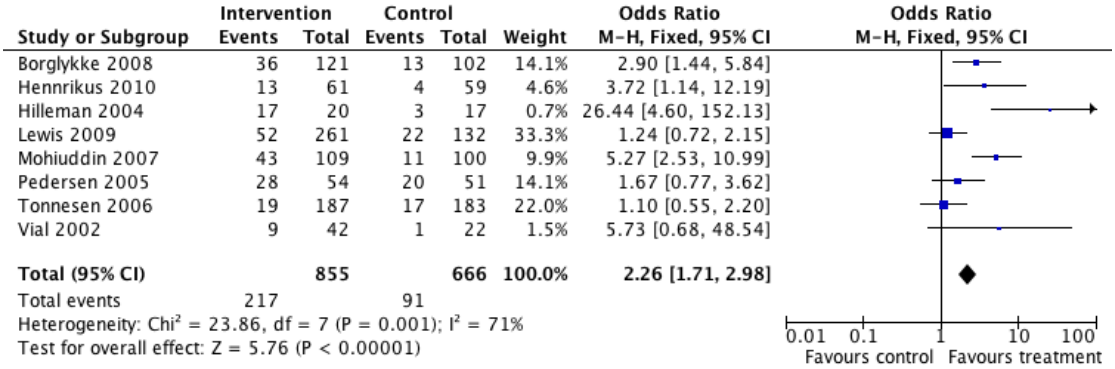
The results of the pooled behaviour support only studies were heterogenous. Removing the outlier (Feeny et al. 2001 [RCT ++]) reduces heterogeneity (p=0.10) with the result remaining significant (OR=1.43, 1.26-1.61).

Intensity 4 interventions are effective without medications and their efficacy further increases when medications are added.

Intensity 5 – behavioural support only



Intensity 5 – behavioural support plus medications

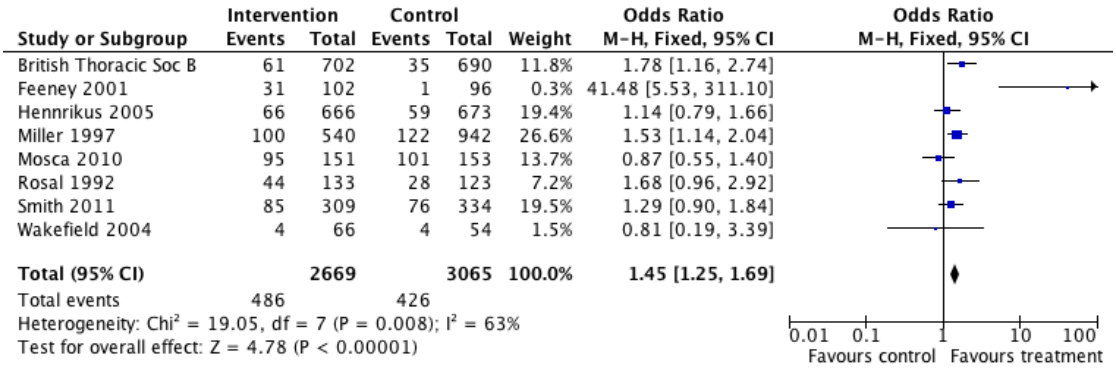


All studies used NRT, Mohiuddin et al 2007 [RCT ++] included bupropion as well and Hennrikus et al 2010 [RCT +] provided a choice of NRT, bupropion or varenicline.

Intensity 5 interventions without medications showed borderline effects, but with medications included, such interventions have good efficacy.

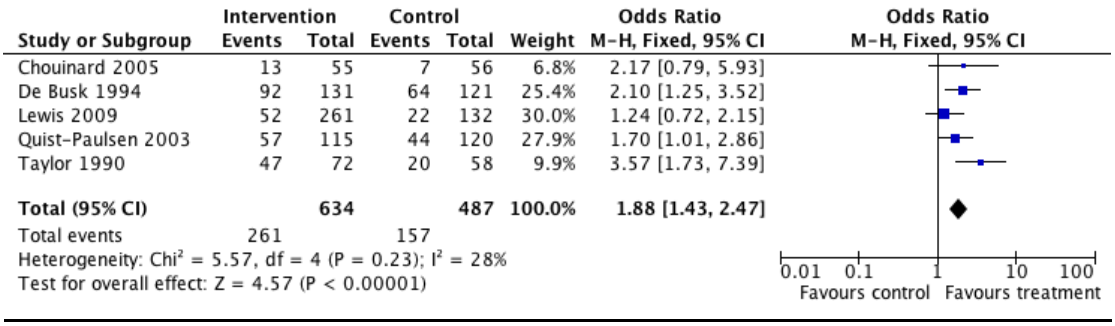
We next re-ran intensity 4 & 5 analyses including only studies which validated self-reported abstinence.

Intensity 4 – behavioural support only – validated

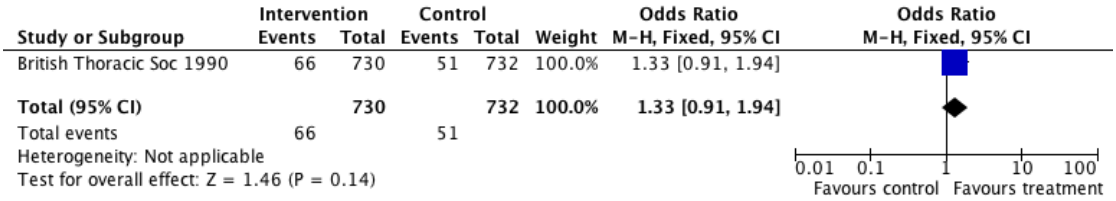


The results of the pooled validated behaviour support only studies were heterogenous. Removing the outlier (Feeny et al. 2001 [RCT ++]) reduces heterogeneity (p=0.28) with the result remaining significant (OR=1.35, 1.15-1.57).

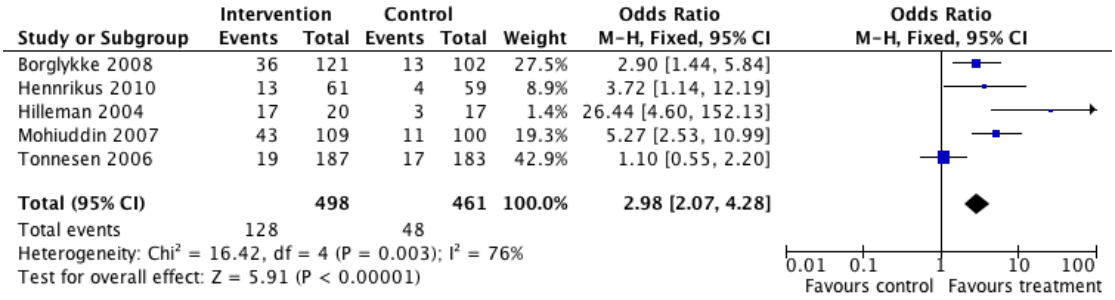
Intensity 4 –behavioural support plus medications – validated



Intensity 5 – behavioural support only – validated



Intensity 5 – behavioural support plus medications – validated



The results of the pooled validated behaviour support plus medications studies were heterogenous. Removing the outlier (Tonnesen et al. 2006 [RCT ++]) reduces heterogeneity (p=0.13) with the result remaining significant (OR=4.39, 2.81-6.84).

The analyses including validated studies only show good efficacy of intensive interventions accompanied by medications, especially when support is provided face-to-face.

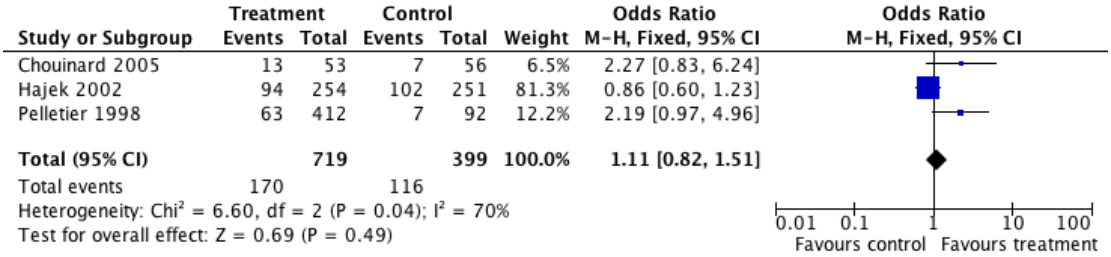
PART 2: PATIENT GROUPS

There is little reason to expect that stop-smoking interventions targeting dependent smokers motivated to quit will differ in efficacy depending on smokers' physical illness. However, we analysed separately the interventions for the main groups of hospital patients.

A. PATIENTS WITH CARDIOVASCULAR DISEASE

Intensity 1: There were no such studies

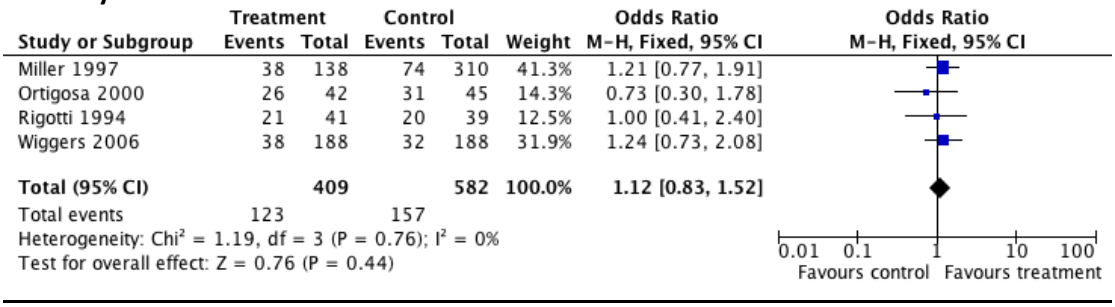
Intensity 2:



Study or Subgroup	Treatment Events	Treatment Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Chouinard 2005	13	53	7	56	6.5%	2.27 [0.83, 6.24]
Hajek 2002	94	254	102	251	81.3%	0.86 [0.60, 1.23]
Pelletier 1998	63	412	7	92	12.2%	2.19 [0.97, 4.96]
Total (95% CI)		**719**		**399**	**100.0%**	**1.11 [0.82, 1.51]**
Total events	170		116			

Heterogeneity: $Chi^2 = 6.60$, df = 2 (P = 0.04); $I^2 = 70\%$
Test for overall effect: Z = 0.69 (P = 0.49)

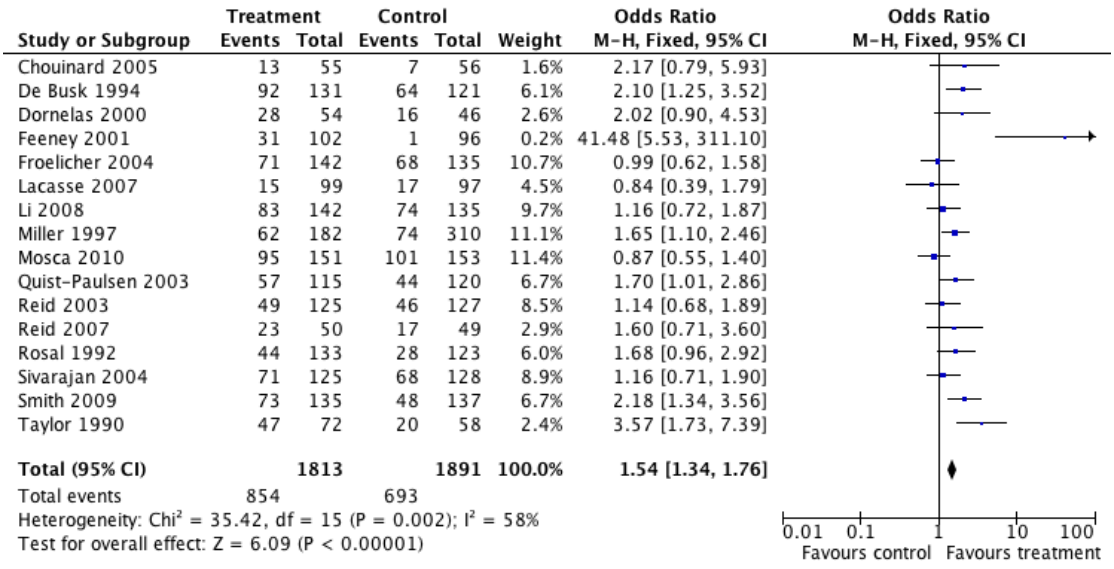
Intensity 3:



Study or Subgroup	Treatment Events	Treatment Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Miller 1997	38	138	74	310	41.3%	1.21 [0.77, 1.91]
Ortigosa 2000	26	42	31	45	14.3%	0.73 [0.30, 1.78]
Rigotti 1994	21	41	20	39	12.5%	1.00 [0.41, 2.40]
Wiggers 2006	38	188	32	188	31.9%	1.24 [0.73, 2.08]
Total (95% CI)		**409**		**582**	**100.0%**	**1.12 [0.83, 1.52]**
Total events	123		157			

Heterogeneity: $Chi^2 = 1.19$, df = 3 (P = 0.76); $I^2 = 0\%$
Test for overall effect: Z = 0.76 (P = 0.44)

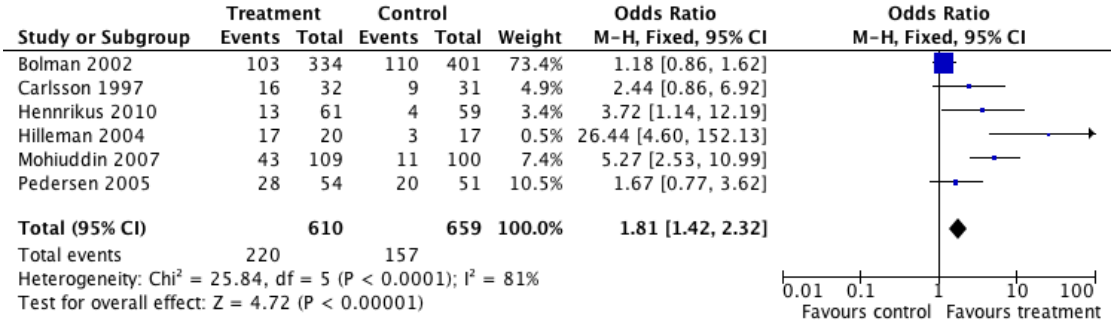
Intensity 4



Study or Subgroup	Treatment Events	Treatment Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Chouinard 2005	13	55	7	56	1.6%	2.17 [0.79, 5.93]
De Busk 1994	92	131	64	121	6.1%	2.10 [1.25, 3.52]
Dornelas 2000	28	54	16	46	2.6%	2.02 [0.90, 4.53]
Feeney 2001	31	102	1	96	0.2%	41.48 [5.53, 311.10]
Froelicher 2004	71	142	68	135	10.7%	0.99 [0.62, 1.58]
Lacasse 2007	15	99	17	97	4.5%	0.84 [0.39, 1.79]
Li 2008	83	142	74	135	9.7%	1.16 [0.72, 1.87]
Miller 1997	62	182	74	310	11.1%	1.65 [1.10, 2.46]
Mosca 2010	95	151	101	153	11.4%	0.87 [0.55, 1.40]
Quist-Paulsen 2003	57	115	44	120	6.7%	1.70 [1.01, 2.86]
Reid 2003	49	125	46	127	8.5%	1.14 [0.68, 1.89]
Reid 2007	23	50	17	49	2.9%	1.60 [0.71, 3.60]
Rosal 1992	44	133	28	123	6.0%	1.68 [0.96, 2.92]
Sivarajan 2004	71	125	68	128	8.9%	1.16 [0.71, 1.90]
Smith 2009	73	135	48	137	6.7%	2.18 [1.34, 3.56]
Taylor 1990	47	72	20	58	2.4%	3.57 [1.73, 7.39]
Total (95% CI)		**1813**		**1891**	**100.0%**	**1.54 [1.34, 1.76]**
Total events	854		693			

Heterogeneity: $Chi^2 = 35.42$, df = 15 (P = 0.002); $I^2 = 58\%$
Test for overall effect: Z = 6.09 (P < 0.00001)

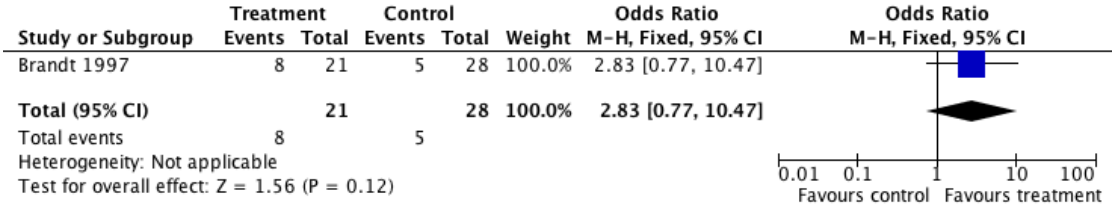
Intensity 5



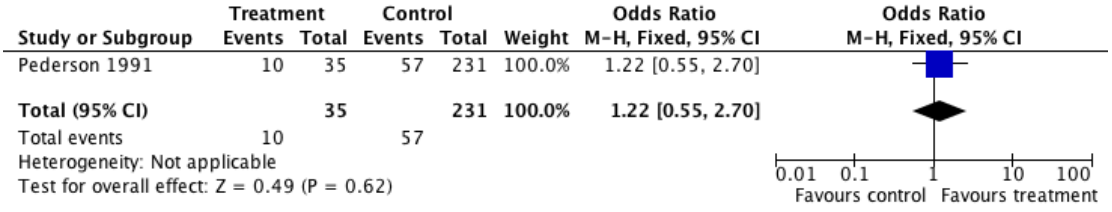
The results are the same as for all patient groups together, showing lack of efficacy for low intensity interventions, and significant effects of interventions providing support over periods longer than four weeks.

B. Patients with respiratory disease

Intensity 1

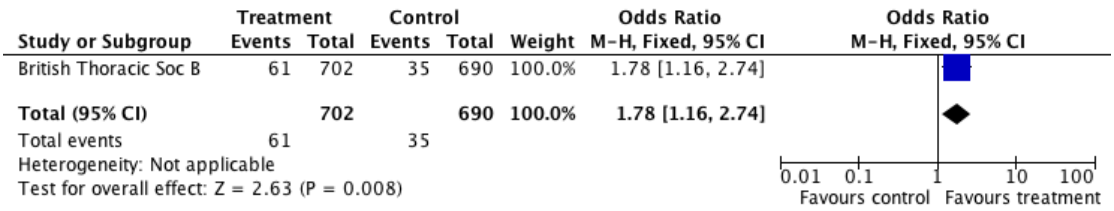


Intensity 2

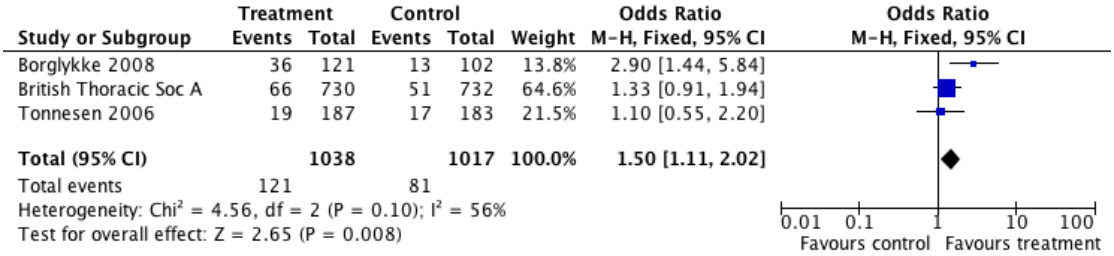


Intensity 3: No studies were available

Intensity 4



Intensity 5



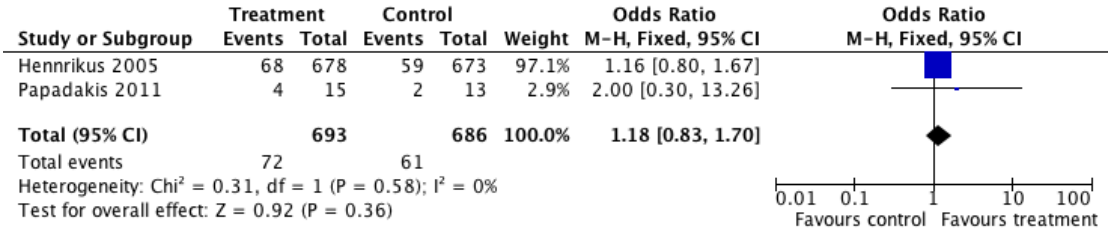
The results are similar to those from other patient groups, showing lack of efficacy for low intensity interventions, and better effects of more intensive interventions, although in this group of studies, only interventions with extended face-to-face support achieved a significant effect.

C. Patients with cancer

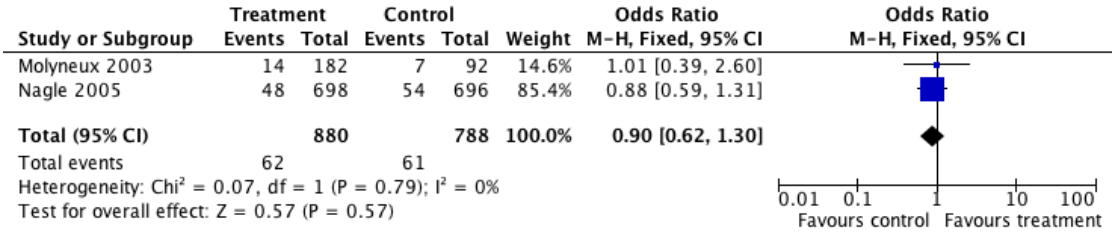
There was only one study focusing on cancer patients. This was Intensity 4 with no medications and showed no intervention effect (Wakefield et al 2004, [RCT ++]).

D. Unselected/other hospital patients

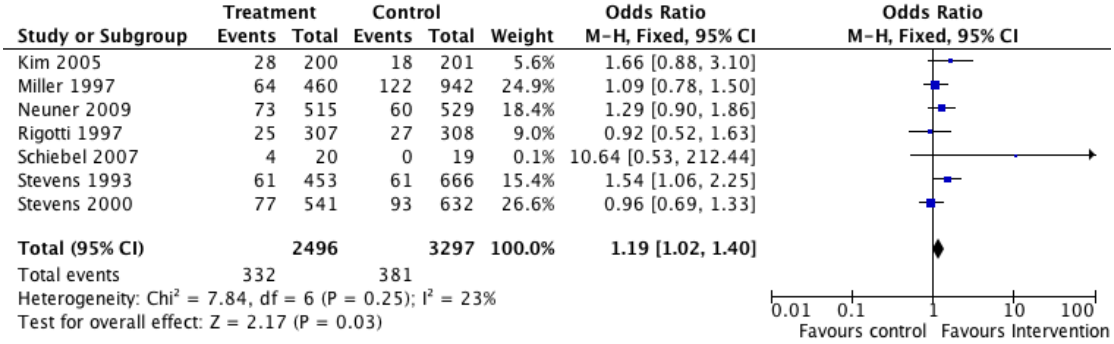
Intensity 1



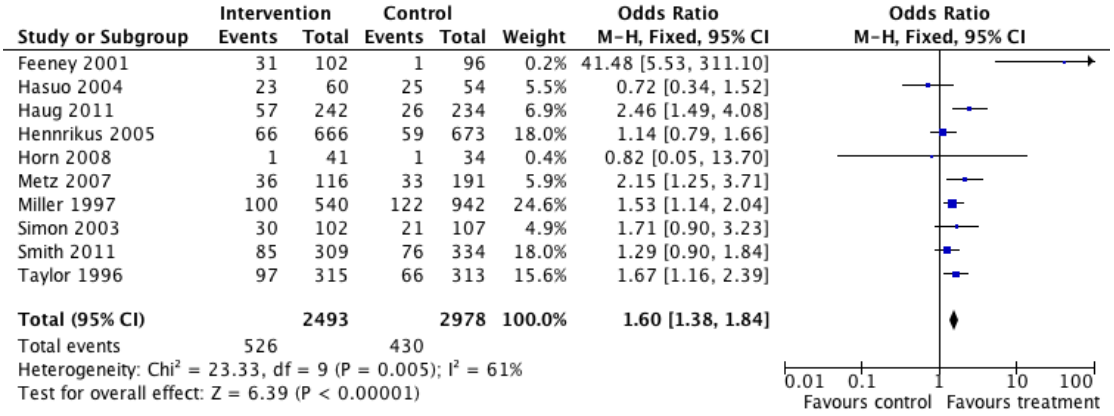
Intensity 2



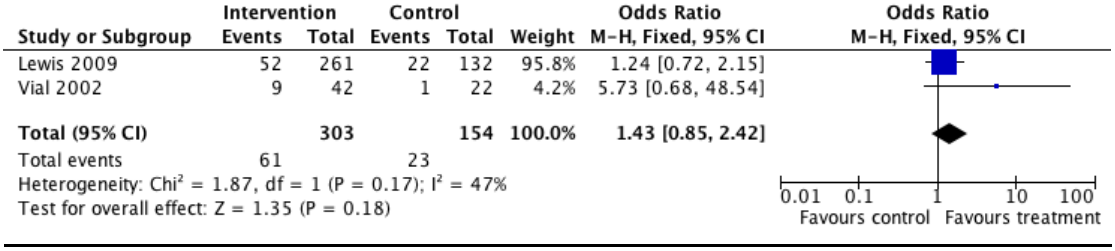
Intensity 3



Intensity 4



Intensity 5

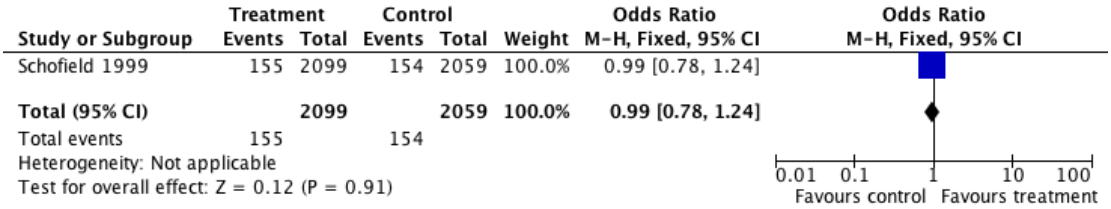


The results show lack of efficacy for low intensity interventions and significant effects of Intensity 4 interventions, though the results of the three Intensity 5 interventions did not reach significance (Lewis et al 2009 [RCT +]; Pedersen et al 2005 [RCT -]; Vial et al 2002 [RCT -]).

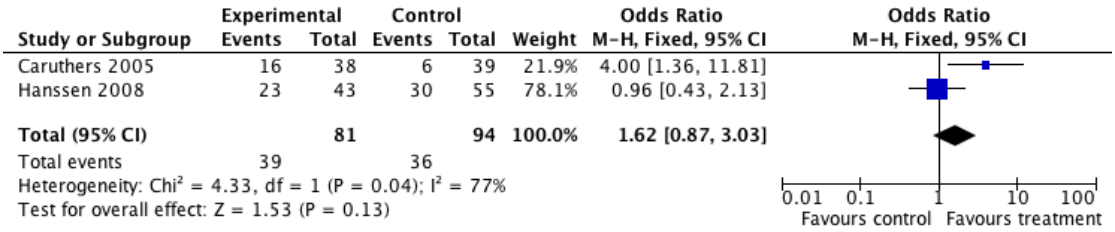
D. Patients receiving intervention after hospital discharge

Three trials evaluated interventions delivered after hospital discharge (i.e. patients did not receive any intervention whilst in hospital). We are including them because they target hospital patients and hospitals could in theory refer patients to such programmes. One trial (Carruthers et al 2005 [RCT +]) included NRT.

Intensity 1



Intensity 4



Only one study evaluating the efficacy of extended support accompanied by NRT showed a significant effect.

CONCLUSIONS

The overall picture emerges showing that brief interventions (Intensity 1 and 2) with users of acute care are not effective, even if they include medications. Regarding interventions providing support for over 4 weeks, interventions with face-to-face support seem to achieve better results than interventions relying on phone calls, but without the addition of medications, any effects are modest. The inclusion of medications strongly enhances efficacy of these treatment.

Note on the impact of professional background of staff delivering stop-smoking interventions

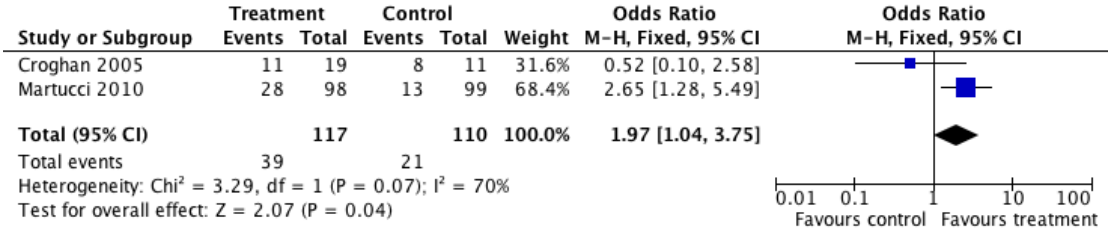
We were unable to assess systematically any effects of the background of the person providing the advice. Brief intervention (Intensity 1 and 2) was provided mostly by doctors, while on-going interventions by telephone calls and face-to-face contacts were provided by trained stop-smoking advisors. It is unlikely that brief intervention (Intensity 1 and 2) by staff other than doctors would be effective. Given that extended support provided by staff other than doctors is effective, encouraging doctors to provide on-going telephone or face-to-face counselling sessions to smokers would not seem an economical use of their time. The professional background of stop-smoking advisors is likely to have limited relevance. The key ingredients of efficacy seem to be the length of support and inclusion of medications

SECTION 2: EFFICACY OF INTERVENTIONS DELIVERED TO SURGERY PATIENTS

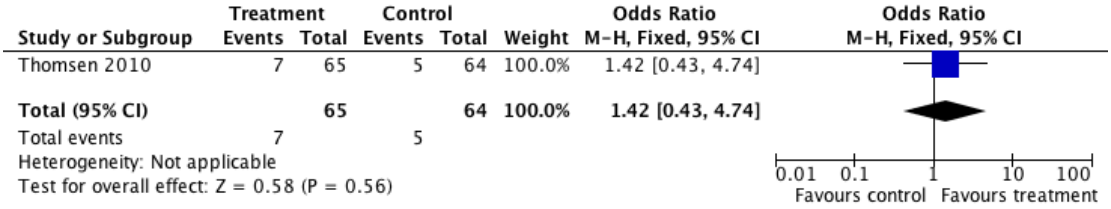
Six trials evaluated interventions initiated prior to surgery. With one exception (Croghan et al 2005 [RCT +]), all trials included NRT.

Intensity 1: There were no such trials

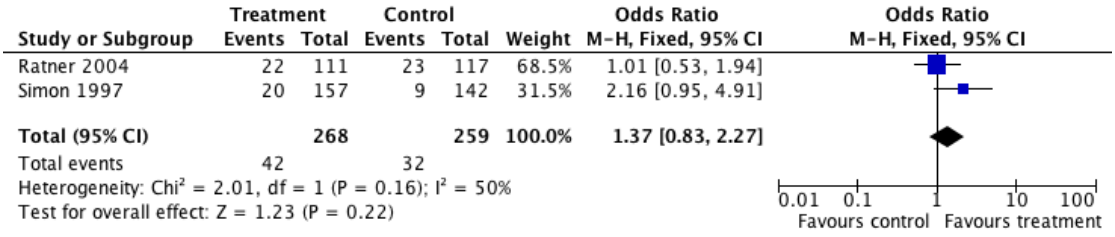
Intensity 2



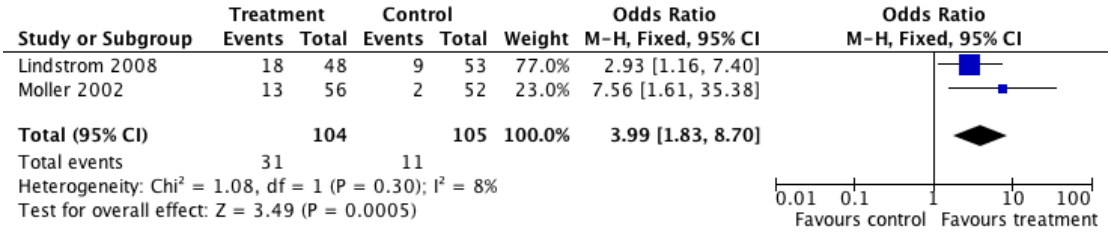
Intensity 3



Intensity 4



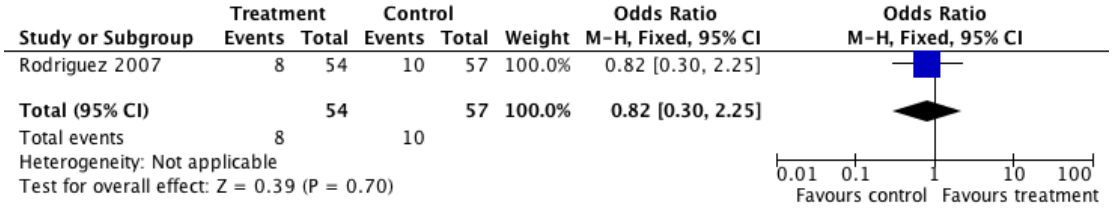
Intensity 5



Of the two studies examining level 2 intensity interventions, one was positive and one was negative. As the larger study was positive, the pooled results reach statistical significance.

Both studies of Intensity 5 interventions provided face-to-face contact and NRT. Both showed good efficacy.

One trial (Rodriquez et al 2007 [RCT -]) evaluated effects of one session of stop-smoking messages delivered under deep sedation.



The intervention had no effect.

CONCLUSIONS

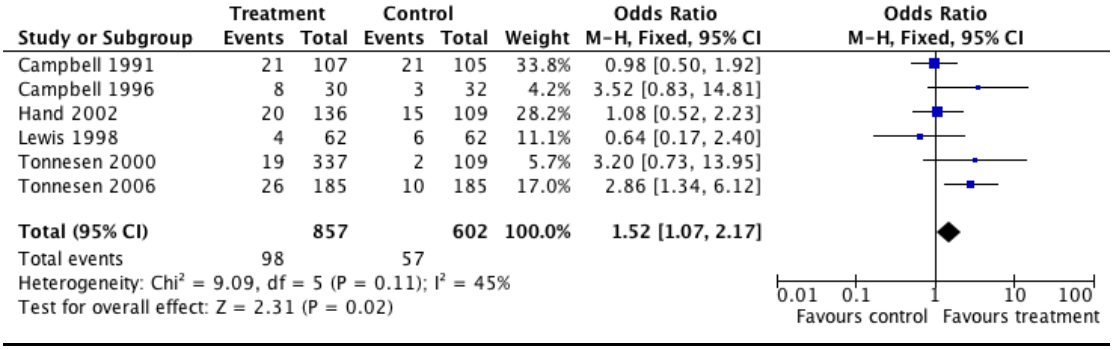
Brief interventions (Intensity 1 and 2) initiated prior to surgery lack efficacy even if accompanied by NRT. Face-to-face support lasting for over 4 weeks accompanied by NRT is effective.

Stop-smoking messages delivered under sedation are not effective.

SECTION 3: EFFICACY OF PHARMACOLOGICAL INTERVENTIONS WITH HOSPITAL PATIENTS

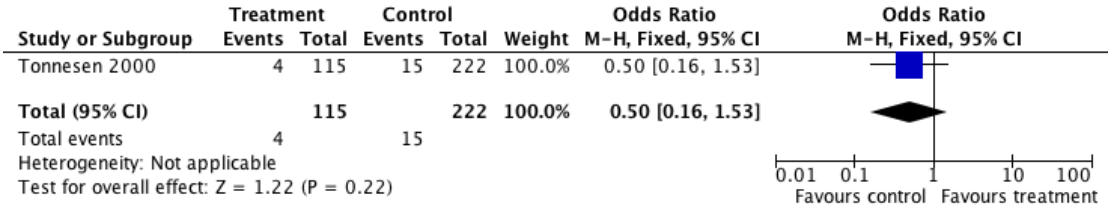
In this section, we cover trials which evaluated medications by comparing study arms with the same intensity of behavioural support which only differed in whether they received active medications or not.

Six trials compared NRT treatment accompanied by behavioural support with the same support delivered with placebo or with no medication. The intensity of behavioural support was 4 or 5 in all trials.



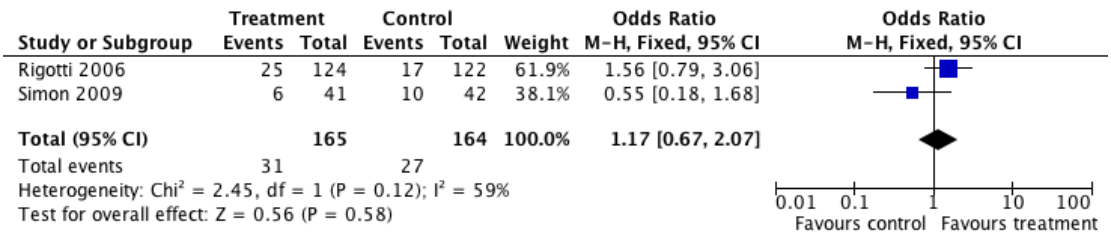
In this group of studies, NRT was effective.

One trial compared patch and inhaler alone with the two medications combined.



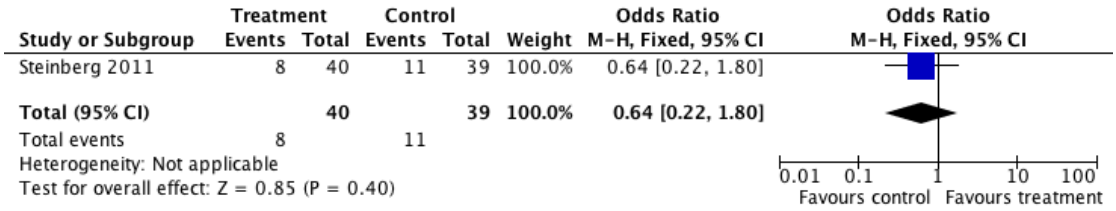
Single NRTs were as effective as their combination.

Two trials compared bupropion and placebo. Both trials relied on telephone calls and neither offered any post-quit face-to-face support.



The trials did not show the intervention effective.

One small placebo controlled trial evaluated varenicline accompanied by brief counselling session/sessions (it is not clear if there was one or more, but it was attended by 16 participants only).



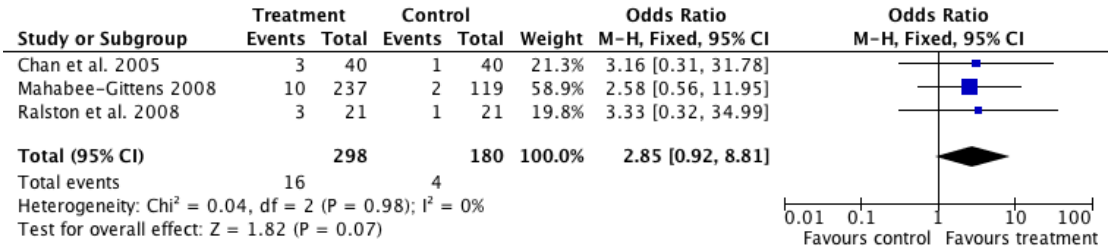
The trial did not find the treatment effective.

CONCLUSIONS

NRT accompanied by behavioural support extended over four weeks is effective. A combination of patches and inhaler was not more effective than each medication on its own. Bupropion and varenicline provided without on-going face-to-face support lack efficacy.

SECTION 4: EFFICACY OF INTERVENTIONS WITH PATIENTS' RELATIVES

Three trials evaluated interventions with parents of children hospitalised on paediatric wards. Two used one-off advice with a phone reminder (Chan et al 2005 [RCT -]) or fax referral to Quitline (Mahabee-Gittens et al 2008 [RCT -]) and one used >30 minutes of counselling and access to NRT for some participants (Ralston et al 2008 [RCT -], Intensity 2). This group of studies had shorter follow-ups (Chan one month, Mahabee-Gittens 3 months, Ralston 6 months).



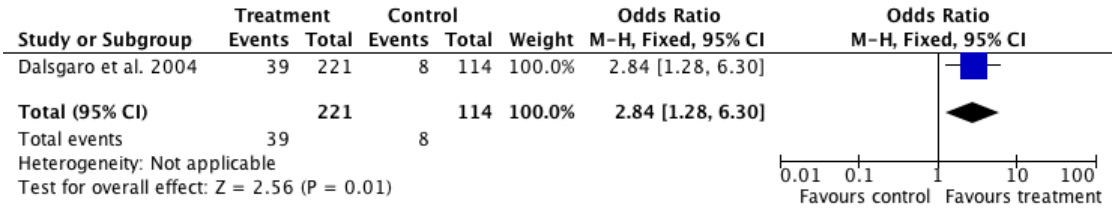
The interventions overall lacked efficacy despite a short follow-up. This is relevant because intervention effects often dissipate over time.

CONCLUSIONS

Brief interventions (Intensity 1 and 2) with parents of hospitalised children lack efficacy.

SECTION 5: EFFICACY OF INTERVENTIONS WITH HOSPITAL STAFF

We found only one study evaluating an intervention with hospital employees. It was a high-quality placebo controlled trial of bupropion with Intensity 5 support.



The trial showed bupropion with regular face-to-face support to be an effective treatment for hospital employees.

CONCLUSIONS

Bupropion accompanied by intensive support is an effective treatment for hospital employees.

SYSTEMATIC REVIEWS

We found two relevant Cochrane reviews. We discussed Rigotti et al. (2007 [systematic review, ++]) review earlier. Our conclusions in the areas covered by Rigotti et al. are similar. The same applies to the review by Thomsen et al. (2010 [systematic review, ++]) concerning surgery patients, also discussed above.

We identified 11 other reviews, listed below. We rated their quality as ++ for systematic reviews showing awareness of key methodological features of stop-smoking studies, + for reviews which were less systematic and/or did not take into account the key quality aspects of included studies, and – for reviews which were selective and/or posed methodological problems. All relevant and eligible studies included in these reviews are also included in our review.

Author	Aim	Number of studies	Findings	Quality
Aziz 2008	Effectiveness of smoking cessation intervention in hospitalised patients with cardiovascular disease	11	Significantly higher abstinence rates in patients receiving intervention in hospital continued post discharge for at least 3 months alongside NRT compared to usual care	+
Barth 2009	Effectiveness of behavioural interventions, telephone support and self-help interventions in people with coronary heart disease (CHD)	16	Positive effects of interventions on abstinence after 6 to 12 months	+
Mistiaen 2008	Effectiveness of follow – up telephone calls in the first month after discharge (not smoking specific)	33	Inconclusive evidence about the effectiveness of telephone FU	++
Munafo 2001	Effectiveness of interventions for hospitalised patients	15	High intensity behavioral support of at least 1 month of follow up contact is effective	++
Nayan 2011	Smoking cessation interventions and rates of smoking in cancer patients	8	No significant difference between interventions and usual care	++
Rice 2008	Effectiveness of nurse-delivered smoking cessation intervention	42	Slightly increased rate of quitting	++
Rice 2009	Effectiveness of nurse-delivered smoking cessation intervention – updated from Rice 2008	34	Interventions of high and low intensity provided by a nurse generated an increased rate of quitting	++
Rigotti 2008	Effectiveness of hospital interventions initiated during hospital stay	33	Counselling initiated during hospitalization with follow up of at least 1 month increased long term smoking cessation	++
Van der Meer 2009	Effectiveness of smoking cessation interventions in people with COPD	5	Interventions including medications were effective	++

Wagena 2004	Effectiveness of behavioural interventions for people with COPD	5	Intensive behavioral support + NRT increased abstinence rates. Bupropion did not increase abstinence rates.	++
Wiggers 2003	Effectiveness of smoking cessation interventions in cardiovascular patients	12	No evidence of effectiveness for pharmacotherapy, self help materials, group, individual or telephone counseling. Limited evidence for doctor or nurse delivered advice	+

NARRATIVE SUMMARY

INTERVENTION INTENSITY

A range of interventions aimed at helping smokers in acute care settings stop smoking has been proposed. Advice by doctors and nurses during a hospital visit, possibly repeated and reinforced during the hospital stay (if applicable) and accompanied by leaflets, is by far the simplest and least expensive option which could be provided routinely on a large scale. Unfortunately, there is no evidence that such interventions work. Smokers in acute care have usually received strong encouragements to stop smoking on a number of previous occasions and the fact that they continue to smoke despite high motivation to stop suggests a high level of dependence and a need for more intensive treatment.

The next level of intervention which is still requiring modest resources is to reinforce the in-hospital intervention by telephone calls over the first few weeks after discharge. This too was not shown effective.

For interventions with acute care patients to be effective, an extended support and stop smoking medication provided for over 4 weeks seem necessary. Face-to-face support may provide better results than support provided over telephone. Importantly, support alone without medications has only uncertain effects but it has good efficacy when provided together with smoking cessation medications.

PATIENT GROUPS

There is no a-priori reason to expect that smokers with different diagnoses would react differently to different interventions. We nevertheless analysed the main patient categories including patients with cardiovascular disease, respiratory disease, and general patient samples separately. The results broadly confirm the main findings. Only Intensity 5 interventions (extended face to face support) accompanied by medications were effective with patients undergoing surgery.

PHARMACOTHERAPY

NRT accompanied by extended multi-session support lasting over 4 weeks is effective in the acute services setting. A few small trials evaluated bupropion and varenicline accompanied by minimal support and did not find such treatments effective. NRT is known to be ineffective without support and follow-up and this is probably true for other stop-smoking medications as well.

PATIENT RELATIVES

Brief interventions (Intensity 1 and 2) with parents of hospitalised children did not show efficacy.

HOSPITAL STAFF

Bupropion with regular face-to-face support is an effective treatment for hospital staff.

IMPACT OF BACKGROUND OF STAFF DELIVERING THE INTERVENTIONS

We were unable to ascertain whether the background of the person providing the interventions affect outcomes, but given that extended support provided by staff other than doctors is effective, encouraging doctors to provide on-going telephone or face-to-face counselling sessions to smokers would not seem an economical approach. The professional background of stop-smoking advisors is likely to be of limited importance. The key ingredients of efficacy seem to be the length of support and inclusion of medications.

EVIDENCE STATEMENTS

Statements 1.1 to 1.5 concern non-surgical patients

ES 1.1: There is strong evidence from trials that validated self-reported abstinence rates that interventions with no follow-up (Intensity 1 and 2) are ineffective.

Two studies of level 1 intensity (Brandt et al 1997 [RCT +]; Papadakis et al 2011 [RCT +]), and five of level 2 intensity support (Chouinard et al 2005 [RCT ++]; Hajek et al 2002 [RCT ++]; Molyneux et al 2003 [RCT ++]; Nagle et al 2005 [RCT +]; Pederson et al 1991 [RCT +]) showed no effect. Pooled data from these studies confirm lack of effect: Intensity 1 OR=2.52 (95%CI: 0.86-7.40); Intensity 2 OR=0.96 (95%CI: 0.89-1.38)

ES 1.2: There is strong evidence from trials that validated self-reported abstinence rates that interventions delivered with telephone follow-ups for up to 4 weeks (Intensity 3) are not effective.

Six studies (Kim et al 2005 [RCT +]; Miller et al 1997 [RCT +]; Ortigosa et al 2000 [RCT +]; Rigotti et al 1994 [RCT ++]; Rigotti et al 1997 [RCT +]; Wiggers et al 2006 [RCT +]) showed no effect. Pooling these data give an odds ratio of 1.11 (95% CI: 0.89-1.38).

ES 1.3: There is strong evidence from trials that validated self-reported abstinence rates that interventions accompanied by on-going behavioural support for over 4 weeks in combination with smoking cessation medications are effective.

Of the eleven studies examining the efficacy of level 4 intensity interventions plus medication compared to usual care six showed a significant benefit (British Thoracic Society [RCT ++]; De Busk et al 1994 [RCT ++]; Feeney et al 2001 [RCT ++]; Miller et al 1997 [RCT +]; Quist-Paulsen et al 2003 [RCT +]; Taylor et al 1990 [RCT +]) and five did not (Chouinard et al 2005 [RCT ++]; Mosca et al 2010 [RCT +]; Rosal et al [RCT ++]; Smith et al 2011 [RCT +]; Wakefield et al 2004 [RCT ++]). When these studies are pooled there is evidence of a beneficial effect of this level of intervention (OR=1.65; 95%CI: 1.42-1.91). There were five studies examining level 5 intensity interventions with medication. Four showed a significantly positive effect (Borglykke et al 2008 [RCT +]; Hennrikus et al 2010 [RCT +];

Hilleman et al 2004 [RCT ++]; Mohiuddin et al 2007 [RCT ++]), and three did not (British Thoracic Society 1990 [RCT ++]; Lewis et al 2009 [RCT++]; Tonnesen et al 2006 [RCT ++]). When these studies are pooled there is evidence of a beneficial effect of this level of intervention (OR=1.87; 95%CI: 1.48-2.36).

ES 1.4: There is strong evidence that interventions with limited follow-up (Intensity 1-3) are not effective across non-surgical patient groups.

All interventions of intensity levels 1-3 were ineffective for patients with **cardiovascular disease** (Chouinard et al 2005 [RCT ++]; Hajek et al 2002 [RCT ++]; Pelletier et al 1998 [RCT -]; Miller et al 1997 [RCT +]; Ortigosa et al 2000 [RCT +]; Rigotti et al 1994 [RCT +]; Wiggers et al 2006 [RCT +]), **respiratory disease** (Brandt et al 1997 [RCT +]; Pederson et al 1991 [RCT +]), and **other groups of hospital patients** (Hennrikus, et al 2005 [RCT +]; Papadakis et al 2011 [RCT +]; Kim et al 2005 [RCT +]; Miller et al 1997 [RCT +]; Molyneux et al 2003 [RCT ++]; Nagle et al 2005 [RCT +]; Neuner et al 2009 [RCT -]; Rigotti et al 1997 [RCT +]; Schiebel et al 2007 [RCT -]; Steven et al 1997 [RCT]; Stevens et al 2000 [RCT -]).

ES 1.5: There is strong evidence that interventions with medications and follow-up of over 4 weeks are effective across non-surgical patient groups.

For patients with **cardiovascular disease** 8 trials of interventions for intensity 4-5 showed a positive effect (De Busk et al 1994 [RCT ++]; Feeney et al 2001 [RCT ++]; Hennrikus et al 2010 [RCT +]; Hilleman et al 2004 [RCT ++]; Mohiuddin et al 2007 [RCT ++] Quist-Paulsen et al 2003 [RCT +]; Smith et al 2011 [RCT +]; Taylor et al 1990 [RCT +]) and 14 did not (Bolman et al 2002 [RCT -]; Carlsson et al 1997 [RCT -]; Rosal 1992 [RCT ++]; Chouinard et al 2005 [RCT ++]; Dornelas et al 2000 [RCT +]; Froelicher et al 2004 [RCT +]; Lacasse et al 2008 [RCT -]; Li et al 2008 [RCT -]; Miller et al 1997 [RCT +]; Mosca et al 2010 [RCT +]; Pedersen et al 2005 [RCT -]; Reid et al 2003 [RCT +]; Reid et al 2007 [RCT -]; Sivarajan et al 2004 [RCT -]). When these studies are pooled there is evidence of a beneficial effect of this level of intervention. Intensity 4 OR=1.54 (95%CI: 1.34-1.76); Intensity 5 OR=1.81 (95%CI: 1.42-2.32).

For patients with **respiratory disease** 2 trials of interventions for intensity 4-5 showed a positive effect (British Thoracic Society B 1990 [RCT ++]; Borglykke et al 2008 [RCT +]) and 2 showed no effect (British Thoracic Society A 1990 [RCT ++]; Tonnesen et al 2006 [RCT ++]). There was only one study of intensity 4 intervention (British Thoracic Society B 1990 [RCT ++]) that showed benefit (OR=1.78; 95% CI:1.16-2.74). Pooling the intensity 5 intervention studies also showed a beneficial effect (OR=1.50 95%CI: 1.11-2.02).

For **other non-surgical groups of hospital patients** 5 trials of interventions for intensity 4-5 showed a positive effect (Feeney et al 2001 [RCT ++]; Haug et al 2011 [RCT -]; Metz et al 2007 [RCT -]; Miller et al 1997 [RCT +]; Taylor et al 1996 [RCT +]) and 7 did not (Hasuo et al 2004 [RCT +]; Hennrikus et al 2005 [RCT +]; Horn et al 2008 [RCT -]; Lewis et al 2009 [RCT +]; Simon et al 2003 [RCT +]; Smith et al 2011 [RCT +]; Vial et al 2002 [RCT-]). Pooling the intensity 4 intervention studies also showed a beneficial effect (OR=1.60 95%CI: 1.38-1.84). However pooling the two Intensity 5 studies (Lewis et al 2009 [RCT +]; Vial et al 2002 [RCT-]) showed no significant effect (OR=1.43; 95%CI: 0.85-2.42).

ES 1.6: There is mixed evidence concerning the efficacy of brief interventions in patients

undergoing surgery.

Only one (Martucci et al 2010 [RCT +]) of three studies (Croghan et al 2005 [RCT +]; Martucci et al 2010 [RCT +]; Thomsen et al 2010 [RCT +]) investigating the efficacy of level 2-3 pre-operative smoking cessation interventions was positive. Pooling data from the intensity 2 studies (Croghan et al 2005 [RCT +]; Martucci et al 2010 [RCT +]) showed a borderline benefit of this level of intervention (OR=1.97; 95%CI: 1.04-3.75). The one study of intensity 3 interventions (Thomsen et al 2010 [RCT +]) showed no effect (OR=1.42; 95%CI: 0.42-4.74).

ES 1.7: There is moderate evidence that in patients undergoing surgery smoking cessation interventions relying mostly on telephone contact (intensity 4) are not effective.

Two trials (Ratner et al 2004 [RCT +]; Simon et al 1997 [RCT -]) showed no effect of this level of intervention. Pooled data gives an odds ratio of 1.37 (95%CI: 0.83-3.27).

ES 1.8: There is strong evidence that in patients undergoing surgery intensive interventions (intensity 5) alongside nicotine replacement therapy are effective.

Two trials (Lindstrom et al 2008 [RCT ++]; Moller et al 2002 [RCT ++]) show a positive effect. Pooled data gives an odds ratio of 3.99 (95%CI: 1.83-8.70).

ES 1.9: There is weak evidence that stop smoking messages delivered under deep sedation are not effective.

One trial (Rodriguez et al 2007 [RCT -]) showed no effect (OR=0.82; 95%CI: 0.30-2.25)

ES 1.10: There is strong evidence that nicotine replacement treatment accompanied by extended support is effective in general hospital patients.

Only one (Tonnesen et al 2006 [RCT ++]) of the six trials (Campbell et al 1991 [RCT ++]; Campbell et al 1996 [RCT ++]; Hand et al 2002 [RCT ++]; Lewis et al 1998 [RCT +]; Tonnesen et al 2000 [RCT ++]; Tonnesen et al 2006 [RCT ++]) examining the efficacy of NRT showed a positive effect. However pooling these data showed a benefit of NRT (OR=1.52; 95% CI: 1.07-2.17).

ES 1.11: There is moderate evidence that bupropion and varenicline provided without face-to-face support are ineffective in acute care non-surgical patients

Bupropion: two trials showed no effect (Rigotti et al 2006 [RCT ++]; Simon et al 2009 [RCT +]). Varenicline: one trial showed no effect Steinberg et al 2011 [RCT +]). The odds ratios (95% CI) for bupropion and varenicline are 1.17 (0.67-2.87) and 0.64 (0.22-1.80) respectively.

ES 1.12: There is weak evidence that low intensity interventions with smoking parents of hospitalised children lack efficacy.

Three trials (Chan et al 2005, [RCT -]; Mahabee-Gittens et al 2008, [RCT -]; Ralston et al 2008 [RCT -]) have all negative results. Pooling these data show no significant effect of such interventions (OR=2.85; 95%CI: 0.92-8.81). There were no studies investigating the efficacy of bupropion or varenicline combined with face-to-face support in acute care patients

ES 1.13: There is moderate evidence that treatment of hospital staff with bupropion combined with regular face-to-face support is effective.

One high quality trial (Dalsgaro et al 2004 [RCT ++]) found a positive effect.

APPLICABILITY STATEMENTS

The NHS practice currently involves interventions at bed-side accompanied by medications and/or referrals to specialist stop-smoking service for treatment after discharge which combines extended face-to-face support with smoking cessation medications. The reviewed evidence confirms that this is likely to be the optimal approach. The high cost of such approach is mitigated by the fact that the NHS provides centrally funded stop-smoking serviceswhich are proactively recruiting smokers and have ample capacity to accept such referrals and to treat them without further costs and without any delays.

CHAPTER TWO: Smoking Cessation Interventions with Users of Maternity Services

INTRODUCTION

Most pregnant smokers in the UK are aware that smoking is unhealthy for their unborn child and many are receptive to stop-smoking encouragement and advice. However, there are several negative prognostic factors present as well, such as young age and living with smokers. Given the potentially serious negative health consequences of smoking for the mother and the child, a provision of help to pregnant smokers is considered an important priority.

A question arises as to what form should such provision take. The options range from one-off brief routine interventions through written materials and phone calls to intensive face-to-face treatments accompanied by medications. Such options differ in the likelihood of success, reach, attractiveness to smoker, and cost.

Due to the importance and emotional appeal of the topic, large investments have been made in the clinical practice but also in research in this area. More randomised trials have examined stop-smoking interventions with pregnant women than with any other single group. Their results can inform the best practice in this field.

This chapter reviews the existing experimental literature. As with the studies from acute care, caution is needed in generalising the results of many of the studies to the UK setting. The NHS actively promotes free specialist multi session face-to-face stop-smoking treatments accompanied by nicotine replacement medications, and it employs specialist staff to provide it. Most of the existing trials were conducted in environments and with methods that were much less favourable to successful smoking cessation than the current UK routine practice.

Our brief was to review RCTs evaluating smoking cessation interventions and interventions aimed at facilitating temporary abstinence. We identified a large number of studies seeking to determine the efficacy of smoking cessation interventions delivered to users of maternity services. We did not identify any studies of interventions aimed at facilitating temporary abstinence. Although changes in cigarette consumption in women who failed to stop smoking are sometimes reported, there is a general consensus that such outcomes have limited value. Given the large volume of material to review, tight time limits, and questionable value of such information, we did not attempt to systematically review the impact of stop-smoking interventions on cigarette consumption. The review focuses on stopping smoking as the key indicator of efficacy.

STRUCTURE OF THE CHAPTER

We found 81 studies evaluating smoking cessation interventions with users of maternity services that had follow-up periods of at least 6 months. The studies are summarised in e.g. the contents of leaflets).

Were were unable to retrieve three relevant studies on time (Secker-Walker et al 1994 [RCT -]; Thornton et al 1997 [RCT +]; Valbo et al 1994 [RCT -]. For these studies, we used data extraction from the Cochrane review. This is noted in the table summarising the included studies.

Table 3. They cover four different topics, which are addressed in the five separate sections.

- Section 1: Efficacy of behavioural interventions delivered during pregnancy. This section concerns trials where study arms differed in the intensity of behavioural support.
- Section 1A: Efficacy of interventions based on incentives
- Section 1B: Efficacy of interventions targeting partners
- Section 2: Efficacy of behavioural interventions delivered post-partum
- Section 3: Efficacy of pharmacotherapies delivered during and/or after pregnancy. This section concerns trials where study arms received the same intensity of behavioural support, but differed in receiving or not receiving active pharmacotherapy.
- Section 4: Efficacy of interventions to prevent relapse

An interpretative summary of findings is provided at the end of each section, and narrative summary and evidence statements are at the end of the Chapter.

Note on data extraction and the quality of relevant studies

In this field, full ITT analysis was rarely provided. Most studies excluded women with miscarriage, those who left their current health service provider, and usually also at least some of the women not available for follow-up. As these different categories were usually merged, we only had an option to go along with the reported sample, or include the full original sample. We opted for including the full sample.

We were struck by the low quality of many of these studies, especially older ones. The denominators used to calculate success rates kept changing, key methodological details were not provided, validation results were not taken into account in calculating outcomes, comparison groups were clustered post-hoc, and many papers convey a sense of a strenuous effort to come up with positive results. The Cochrane review of this literature (Lumley et al. 2009 [Systematic Review +]) is also of a lower standard than other Cochrane reviews, with limited attention paid to methodological considerations specific to smoking cessation research and categorisation of studies in a way that is not useful for practical considerations (e.g. the contents of leaflets).

Were were unable to retrieve three relevant studies on time (Secker-Walker et al 1994 [RCT -]; Thornton et al 1997 [RCT +]; Valbo et al 1994 [RCT -]. For these studies, we used data extraction from the Cochrane review. This is noted in the table summarising the included studies.

TABLE 3: SUMMARY OF STUDIES INCLUDED IN CHAPTER 2

Albrecht et al 1998, US	*Participants:* 84 teenage smokers *Interventions:* 8 didactic group sessions (TFS) or same with one-to-one non-smoking peer buddy (TFSB) (Intensity 5) *Control procedure:* Usual care (30 minute individual session with nurse). TFS program adapted by one developed by American Cancer Society. *Outcomes:* 4-6 weeks post intervention *Validation:* CO *Quality:* - Note: Study poorly reported, focus on cigs/day, results massaged. 5 quitters in TFS and UC groups combined (so estimate 2 and 3, though it is possible the actual figures not reported because all 5 were in UC). Unclear who carried out intervention.
Baric et al 1976, UK	*Participants:* 110 smokers, recruited at first antenatal visit (<20 weeks gestation) (I: n=63, C: n=47) Interventions: one-to-one counselling from senior medical student. Strong encouragement to quit, or reduce to <5 cigs/day (Intensity 1) *Control procedure*: Usual care (advice at discretion of the doctor) *Outcomes:* 11 weeks after baseline visit *Validation*: none *Quality:* -
Bauman et al 1983 USA	*Participants:* 170 pregnant women, 79 current smokers, in 1st or 2nd trimester *Interventions:* CO breath test plus anti-smoking advice delivered by the regular health educators at ante-natal clinics (Intensity 1) *Control procedure: Anti-smoking advice only* *Outcomes:* Self reported abstinence 6 weeks after intervention/advice *Validation:* none *Quality:* -
Belizan et al 1995, Latin America (4 countries)	*Participants:* 532 smokers *Interventions:* 4-6 home visits at 22, 26, 30 and 34 weeks gestation attended by social worker or nurse and support person, booklets, 'antismoking program'. Specially trained

	female social workers or obstetrics nurses delivered the intervention (intensity 5) *Control procedure:* Usual care provided by physicians and nurses *Outcomes:* 14 weeks post start of intervention (36 weeks of gestation) *Validation:* none *Quality:* - Note: Smoking one of a range of health behaviour interventions, no quit rates reported, figures below derived from a table in the paper
Bullock et al 1995, New Zealand	*Participants:* 131 women (50% smokers) with telephone access, single or with unemployed partner *Intervention:* Introduction pack plus weekly telephone call to provide support by trained volunteer until 12 weeks postpartum. (Intensity 4) *Control procedure:* Introduction pack and publicly available educational material *Outcomes:* 34/40 weeks of gestation *Validation:* none *Quality:* -
Bullock et al 2009, USA	*Participants:* 695 smokers *Interventions:* 1) Booklets alone; 2) Social support alone (weekly calls and a beep to provide 24-7 contact with nurse if needed); 3) Social support + booklet (Intensity 4) *Control procedure:* Usual care (pamphlet) *Outcomes:* 6 week post partum, PP *Validation:* Salivary cotinine *Quality:* +
Burling et al 1991, US	*Participants:* 139 smokers *Interventions:* Educational program by clinic nurse, personal letter from Chief of the Prenatal Clinic recommending quitting, CO feedback and 'Why Start Life Under a Cloud' booklet . Clinic nurse provided advice regarding health behaviours (including smoking). (Intensity 2) *Control procedure:* Usual care by nurse *Outcomes:* 34 weeks of gestation (not clear how long after intervention), not clear how smoking status established *Validation:* unclear (CO was measured by no mention of use to validate self-reports) *Quality:* - Note: Poorly reported, only % with little info on how calculated.
Cinciripini et al 2000, US	*Participants:* 82 smokers

	Interventions: Usual care with physician, mailed materials (Quit Calendar and Tip Guide) and 6 videos (Intensity 4) *Control procedure:* Usual care with physician and mailed materials only *Outcomes:* 4-5 post TQD and 1M post-partum, not clear how asked *Validation:* salivary cotinine at both time points *Quality:* + *Note:* Intervention to get staff involved had no effect on staff behaviour. Badly reported, figures do not tally.
Coleman et al 2012, UK	*Participants:* 1,050 smokers *Interventions:* 4 weeks nicotine patch 15mg/16 hours (plus another 4 weeks if abstinent one month after quit date) plus midwife counselling at baseline and 3 FU telephone calls (QD, 3 days post quit and at 4 weeks). 'Research midwife' specified, trained to provide behavioural support according to national standards (Intensity 3) *Control procedure:* As above but placebo patch *Outcomes:* Sustained abstinence, but allowing <5 cigs on up to 5 occasions *Validation:* CO or salivary cotinine *Quality:* ++
Cope et al 2003, UK	*Participants:* 280 smokers *Interventions:* Feedback on urine cotinine test, leaflet, quit-date set, procedure repeated at each visit up to delivery (number of visits not given) with reinforcement of advice. Counselling about smoking in pregnancy from hospital midwife and obstetrician as part of usual care (Intensity 5) *Control procedure:* Routine counselling from doctor or midwife *Outcomes:* 36 weeks; not clear how asked *Validation:* not matched to self-report so classified as none (colourimetry) *Quality:* - Note: 'Validated' N larger than self-reported, and write-up unclear. It was also unclear who carried out intervention.
De Vries et al 2006, Netherlands	*Participants:* 328 smokers *Interventions:* Video, self-help guide, booklet on effects of remaining smoke free post-delivery, booklet for partners (see note below), monthly sessions with MWs providing brief health counselling (who discussed smoking at 3 and 8 months gestation). MW trained based on work with MIS protocol, dedicated 10mins of consultation to smoking cessation (Intensity 5) *Control procedure:* Usual care from MW *Outcomes:* 6 weeks post intervention (PP) and 6 weeks post-partum (PP at both time points)

	Validation: Only 7 urine samples available post-partum, not taken into account *Quality:* - Note: Cluster randomised, no Ns given. Partner intervention is reported as having no effect, but no figures, % or Ns are provided.
Donatelle et al 2000, US	*Participants:* 309 smokers *Interventions:* Advice (delivered by WIC program or research staff) and self-help kit, designated supporter, monthly incentives for validated abstinence to both ($50 for first and last quit month and $25 for additional quit months), monthly phone calls for 10 months including 2M post-partum (intervention delivered by trained program or research staff) (Intensity 5). *Control procedure:* As above but no designated support. Brief intervention (Intensity 1 and 2) delivered by trained WIC program or SOS program research staff. *Outcomes:* 7-day PP at 8M gestation and 2M post-partum *Validation:* Salivary thiocyanate at all time points *Quality:* +
Dornelas et al 2006, US	*Participants:* 105 smokers *Interventions:* 1.5 hour counselling session and bi-monthly phone follow-up during pregnancy and monthly phone FU for 6 months post-delivery, conducted by a masters prepared mental health counsellor (Intensity 4) *Control procedure:* Usual care (standard cessation advice from a HCP) *Outcomes:* 7-day PP at delivery and 6M post-partum *Validation:* CO at all time points *Quality:* +
Dunkley et al. 1997, US	*Participants:* 100 smokers *Interventions:* Intervention midwives were trained to assess stage of change and provided a behavioural intervention (few details on intervention reported) (Intensity 1) *Control procedures:* Usual care Outcomes: 11-18 w and 37 w Validation: none Quality: - Notes: Includes care providers' views, include in review 3
Ershoff et al 1989, US	*Participants:* 242 smokers *Interventions:* Advice from health educator, leaflet and first of 8 booklets, others mailed weekly. (Intensity 4) *Control procedure:* Advice and leaflet only from health educator

	Outcomes: Continuous abstinence from week 20 to delivery *Validation:* Urinary cotinine *Quality:* ++
Ershoff et al 1995, US	*Participants:* 171 recent quitters *Interventions:* Advice from health educator, leaflet and 4 booklets with remaining 4 mailed at weekly intervals (Intensity 3) Intervention given during pregnancy *Control procedure:* 1 page tip sheet and behavioural technique for avoiding relapse *Outcomes:* 7-day PP during 3rd trimester *Validation:* Cotinine *Quality:* +
Ershoff et al 1999, US	*Participants:* 390 smokers *Interventions:* Booklet and 4-6 weekly proactive MI counselling sessions over phone with nurse (Intensity 4) *Control procedure:* 1) Tailored booklet; 2) Booklet plus access to automated phone messages, both by prenatal care providers (Intensity 1-2) *Outcomes:* 7–day PP at 34 weeks *Validation:* Urinary cotinine *Quality:* + Note: Very few phone messages were accessed, control procedure merged
Gielen et al 1997, US	*Participants:* 391 smokers *Interventions:* Booklet, 2 letters of encouragement mailed 1-2 weeks after first visit, baseline session with peer advisor, advice at each pre-natal visit from RNs and MDs (Intensity 5) *Control procedure:* Usual care from nurse *Outcomes:* 7-day PP at third trimester *Validation:* Salivary cotinine *Quality:* + Note: Documents high misreport rate, salivary failures 7 (37%) in I and 10 (48%) in C.
Hajek et al 2001 A, UK	*Participants:* 871 smokers *Interventions:* Baseline session with MW, tailored booklet ('How to stop smoking for good' or 'How to stay off smoking for good'), CO feedback plus invitation to pair with another pregnant smoker (Intensity 1) *Control procedure:* Usual care from MW *Outcomes:* 3M continuous abstinence at delivery and continuous abstinence 6M post-

	delivery *Validation:* CO *Quality:* ++ Note: Cluster randomised
58 et al 2001 B, UK	*Participants:* 249 recent ex-smokers *Interventions:* Baseline session with MW, tailored booklet ('How to stop smoking for good' or 'How to stay off smoking for good'), CO feedback plus invitation to pair with another pregnant smoker. (Intensity 1) *Control procedure:* Usual care from MW *Outcomes:* 3M continuous abstinence at delivery and continuous abstinence 6M post-delivery *Validation:* CO *Quality:* ++ Note: Cluster randomised; MWs had difficulty recruiting pregnant women
Hannover et al 2009 A, Germany	*Participants:* 338 smokers *Interventions:* Counselling in mothers home by trained counsellor + FU calls (4 and 12 weeks). Four counsellors were trained and supervised by a member of the Motivational Interviewing Network of Trainers. (Intensity 4) *Control procedure:* Usual care and self help material for each parent. *Outcomes:* 24 month sustained abstinence *Validation:* None *Quality:* -
Hannover et al 2009 B, Germany	*Participants:* 304 ex- smokers, post-partum women who were abstinent for 4 weeks at baseline *Interventions:* as above. *Control procedure:* as above *Outcomes:* 24 month sustained abstinence since birth of baby *Validation:* None *Quality:* -
Hartman et al 1996, US	*Participants:* 207 smokers *Interventions:* Advice and goals by doctors at each ante-natal visit, letter of support from physician and monthly postcards, CO feedback, volunteer counsellors (Intensity 5) *Control procedure:* Standard care by doctor *Outcomes:* Abstinence (unspecified) at end of pre-natal care

	Validation: CO *Quality:* +
Hegaard et al 2003, Denmark	*Participants:* 647 smokers *Interventions:* MW counselling at prenatal visit, CO, offer of a smoking cessation program of 9 one-to-one or group sessions over 14 weeks chaired by MW plus offer of NRT (Intensity 5) *Control procedure:* Usual care by MW *Outcomes:* Abstinence at 37 weeks (not clear if PP or cont) *Validation:* salivary cotinine *Quality:* + *Note:* Over 50% misreport rate - self-reported 14.4% (N=47) vs. 5% (16); validated 7% vs. 2.2%
Heil et al 2008, US	*Participants:* 82 smokers *Interventions:* Incentives contingent on abstinence (up to $1,180) for up to 24w post-partum, incremental, re-set after lapses. Visits daily for days 1-5, 2nd week twice weekly visit, week 3-7 once a week, biweekly until delivery (Intensity 5) *Control procedure:* Incentives to attend ($15 per visit antepartum and $20 per visit postpartum), non-contingent on abstinence *Outcomes:* Sustained abstinence at 28w or above; 7-day PP at 12 w and 24 w post partum. *Validation:* Urine cotinine *Quality:* + *Note:* Cluster randomised, cont. abstinence data collected but not reported for post-partum period. Unclear who provided the intervention (paper states 'clinic staff')
Higgins et al 2004, US *(pilot study for Heil et al. 2008)*	*Participants:* 53 smokers *Interventions:* As in Heil (Intensity 5) *Control procedure:* Incentives to attend ($11.50 per visit antepartum and $20 per visit postpartum), non-contingent on abstinence. *Outcomes:* As in Heil, but PP only *Validation:* As in Heil *Quality:* - *Note:* Only partially randomised, the rest assigned 'as consecutive admissions' – not explained. Unclear who provided the intervention, possibly study staff in obstetric clinic.
Higgins et al 2010, USA	*Participants:* 166 smokers *Interventions:* Abstinent contingent vouchers ($35) – visits daily for 5 days, twice weekly in week 2 (for 7 weeks), then weekly for 4 weeks, every other week until delivery.

	Postpartum visit once weekly for the first 4 weeks then every other week to 12 weeks (Intensity 5) *Control procedure:* As above + non-contingent vouchers ($35) *Outcomes:* end of pregnancy and 24 weeks post-partum, PP *Validation:* CO validated and urinary cotinine *Quality:* + Notes: Unclear who provided intervention
Hjalmarson et al 1991, Sweden	*Participants:* 653 smokers *Interventions:* Self-help manual delivered by obstetrician (Intensity 1) *Control procedure:* Usual care (information sheet from doctor) *Outcomes:* Continuous abstinence end-of-pregnancy and 8w post-partum *Validation:* Blood thiocyanate at all time points *Quality:* +
Hotham et al 2006, Australia	*Participants:* 40 smokers *Interventions:* 5 min counselling, quit brochure, set QD, 2 min supportive counselling given at all antenatal visits + Nicotine patches . Researchers officers were midwives who had undergone training with Quitline Staff (Intensity 4) *Control procedure:* As above but no offer of free NRT *Outcomes:* last antenatal visit *Validation:* CO and salivary cotinine *Quality:* ++ *Note:* No data provided for post partum outcomes
Johnson 2000, Canada	*Participants:* 254 ex-smokers *Interventions:* RP counselling in-hospital, self help materials, 8 telephone calls by the nurse who initiated counselling in-hospital (Intensity 4) *Control procedure:* Usual care *Outcomes:* 6 months post partum (not clear if PP or cont) *Validation:* CO validated *Quality:* +
Kapur et al 2001, Canada	*Participants:* 30 smokers *Interventions:* Nicotine patch (daily, 18-hour patch 15mg for 8 weeks, 10mg for next 2 weeks and 5mg for last 2 weeks), 4 counselling sessions at baseline, 1, 4 and 8 weeks provided by the Motherisk Program plus weekly telephone contact with researcher

	(Intensity 5) *Control procedure:* Placebo gum, same support *Outcomes:* Abstinence in 2nd Trimester (not clear if PP or cont) *Validation:* Serum thiocyanate *Quality:* + *Note:* Study stopped when rapid foetal movement occurred 3h after stopping smoking in a woman on placebo.
Kendrick et al 1995, USA	*Participants:* 5572 smokers *Interventions:* Different "models" and focus in each state but all used counselling + written materials (Colorado intervention: 5-minute counselling sessions by the nurse, 8 brochures for pregnant smokers and 1 brochure for postpartum women; Maryland intervention: brief counselling with self-help materials; Missouri intervention: written materials plus emphasis on being a lifetime ex-smoker) (Intensity 1) *Control procedure:* Usual care *Outcomes:* Questionnaire at 8 month of pregnancy at 6-12 week post-partum visit (data for this not included). Not clear if PP or continuous. *Validation:* Urine cotinine *Quality:* - Note: Cluster randomised (prenatal clinics across 3 states). ITT cannot be calculated as total Ns for intervention and control were not reported. Unclear who provided intervention
Lawrence et al 2003, UK	*Participants:* 918 smokers *Interventions:* a) 6 TTM based self help manuals) b) TTM self help manual and support from MW + sessions with an interactive computer programme giving tailored SC advice (both conditions delivered by MW and had 3 face to face sessions to discuss manual) (Intensity 5) *Control procedure:* Standard care delivered by MW *Outcomes:* 28-30 week and 10 day postpartum continuous abstinence *Validation:* Urine cotinine *Quality:* + Note: Cluster randomised
Lilley et al 1986, UK	*Participants:* 151 smokers *Interventions:* Individual counselling from doctor and leaflets directed at patient and partner, FU at 4 weeks at home, letter reinforcing advice to stop smoking 2 weeks after first visit (Intensity 4) *Control procedure:* Usual care *Outcomes:* 6 weeks after intervention (not clear if PP or cont)

	Validation: None *Quality:* -
Loeb et al 1983, US	*Participants:* 963 smokers *Interventions:* Letter of invitation, group meeting with short information session by physician, individual session with trained smoking counsellor, 6 weekly group sessions and follow up groups and calls (Intensity 5) *Control procedure:* Usual care *Outcomes:* Late pregnancy (not clear if PP or cont) *Validation:* Cord blood thiocyanate Quality: +
Lowe et al 1998, a Australia	*Participants:* 217 smokers *Interventions:* 1 session with MW and self-help manual, signed contract to stop smoking between participant and partner and between participant and quit-smoking friend (Intensity 1) *Control procedure:* Manual alone *Outcomes:* 20 week antenatal visit, PP *Validation:* Urinary cotinine *Quality:* +
Lowe et al 1998, b Australia	*Participants:* 108 smokers *Interventions:* 1 session with MW and self-help manual (Intensity 1) *Control procedure:* Usual care *Outcomes:* 20 week antenatal visit, PP *Validation:* Urinary cotinine *Quality:* + Note: Cluster randomised
Lowe et al 1997, Australia	*Participants:* 78 pregnant ex-smokers *Interventions:* 10 minute counselling with health educator, RP materials, materials to enhance social support, chose “buddy”. Reinforcement at routine visits by clinic staff (Intensity 5) *Control procedure:* Usual care including nurse advice *Outcomes:* Continued abstinence at end of pregnancy *Validation:* Saliva thiocyanate *Quality:* - (analysis does not include LTF as greater in control group)

Macarthur et al 1987, UK	*Participants:* 982 smokers *Interventions:* Health education from obstetrician about smoking at clinic visit plus leaflet (or delivered by MW if overlooked by obstetrician) (Intensity 1) *Control procedure:* Usual care (routine advice) *Outcomes:* At delivery smoking status noted *Validation:* urinary cotinine obtained for some of the women but later abandoned *Quality:* -
Malchodi et al 2003, US	*Participants:* 142 pregnant smokers *Interventions:* usual care + peer-led smoking cessation programme from the clinic HCPs and smoking cessation counselling from lay community health outreach workers (8 face to face contacts) (Intensity 5) *Control procedure:* Usual care by doctors and nurses which included regular advice at each prenatal visit *Outcomes:* 36 week gestation *Validation:* CO and urinary cotinine, not clear if cont or PP *Quality:* +
Mayer et al 1990, USA	*Participants:* 219 smokers *Interventions:* A: 1 session (20 mins) and booklets on behavioural strategies plus contract with quit date; B: 1 session (10 mins) and booklets on risk to baby (both by health educator) (Intensity 1) *Control procedure:* Usual care (written materials plus clinic attendance) *Outcomes:* Abstinence at last month of pregnancy (not clear if PP or cont) *Validation:* No (partial, results not taken into account) *Quality:* - Note: Poorly reported study. Interventions did not differ but better than UC
McBride et al 1999, USA	*Participants:* 897 (mixed smokers and recent quitters) *Interventions:* 1) Booklet plus pre-partum intervention: self-help booklet, mailed an RP kit, 3 pre-partum calls and a personalised letter; 2) Same plus 3 counselling calls within the first 4 months post-partum and newsletters at 2, 6 and 12 weeks post-partum (both Intensity 4) *Control procedure:* Self-help booklet only *Outcomes:* 7-day PP at 28 weeks of pregnancy and 12 months postpartum (longest F-U) *Validation:* Saliva samples (not consistent, outcomes based on self-reports) *Quality:* -

McBride et al b 1999, US	*Participants:* 438 ex-smokers at 28W of pregnancy (mixture of smokers and ex-smokers at baseline, all received intervention, see McBride et al 1999a) *Interventions:* 3 counselling calls within the first 4 months post-partum and newsletters at 2, 6 and 12 weeks post-partum (Intensity 4) *Control procedure:* Prenatal intervention or prenatal routine care – nothing post partum, so merged *Outcomes:* 7-day PP 12 months postpartum *Validation:* Inconsistent and not taken into account *Quality:* -
McBride et al 2004, US	*Participants:* 316 ex-smokers *Interventions: 1)* 3 counselling calls in pregnancy; 3 postpartum, monthly. Motivational Interviewing. Late pregnancy RP kit. 2) Partner assisted – as 1 plus advice to use partner as coach + 6 calls to partner + cessation support for smoking partners (Intensity 4) *Control procedure:* Usual care (provider advice and mailed pregnancy specific S-H) *Outcomes*: 7-day PP at 28 weeks and 12 month postpartum *Validation:* Saliva cotinine Quality: + Notes: Combined interventions 1 and 2 versus control for analysis. Unclear who provided intervention
McLeod et al 2004, New Zealand	*Participants:* 297 smokers at time of conception *Interventions:* 1) Smoking Education Group: education and support for cessation and reduction by MW; 2) Breast-feeding Group: education and support for breast feeding women who smoked by MW; 3) Combined Group: MW implemented smoking education and breast-feeding programmes (Intensity 4) *Control procedure:* Usual care by MW *Outcomes:* 36 weeks gestation and 4 months post partum (not clear if PP or cont) *Validation:* Serum cotinine (not clear if all data is validated or takes into account positive results) *Quality:* + Note: Cluster randomised
Moore et al 2002, UK	*Participants:* 1527 smokers *Interventions:* Usual care plus first of 5 booklets provided by MW, remaining 4 mailed to women (Intensity 1) *Control procedure:* Usual care only by MW *Outcomes:* 7-day PP at smoking status at the end of the 2nd trimester, PP *Validation:* Urinary cotinine

	Quality: + Note: Cluster randomised
Morasco et al, 2006	*Participants:* 33 ex-smokers *Interventions:* individual counselling, 90 minutes psychotherapy session and bimonthly phone calls from mental health counsellors (Intensity 4) Intervention given during pregnancy. *Control procedure:* Usual care *Outcomes:* 7-day PP at end of pregnancy and 6 month post partum *Validation:* CO validation *Quality*: +
O'Connor et al 1992, Canada	*Participants:* 224 smokers *Interventions:* Usual care plus a 20 minute one-to-one session with a public health nurse and a telephone FU (Intensity 3) *Control procedure:* Usual care (included brief intervention (Intensity 1 and 2) from MW + 2 hour group session by research nurse plus 1 follow up session) *Outcomes:* 7-day PP at 36 weeks gestation and 6 weeks postpartum, PP *Validation:* Urinary cotinine *Quality:* +
Oncken et al 2008, US	*Participants:* 194 smokers *Interventions:* Individual counselling and 6 week treatment with nicotine gum (Intensity 5) *Control procedure:* Same support with placebo gum *Outcomes:* 7-day post-partum at 32-34 weeks of gestation and 6-12 weeks postpartum *Validation:* Urinary cotinine and CO validated at both time points *Quality:* +
Panjari et al 1999, Australia	*Participants:* 732 smokers *Interventions:* Usual care plus 4 counselling sessions with same MW (first session 25 mins included video, subsequent sessions brief between 5-10 mins) up to 28w, booklets (Intensity 5) *Control procedure:* Usual care *Outcomes:* Abstinence at 34-36 weeks (not clear if PP or cont) *Validation:* Urinary cotinine *Quality:* + Note: N kept changing in the report, N randomised and evaluable used for data

	extraction.
Patten et al 2010, USA	*Participants:* 35 smokers *Interventions:* counselling at baseline based on the 5A's, video + FU calls at 1, 2, 4 and 6 weeks by a female counsellor (Intensity 4) *Control procedure:* Brief intervention (Intensity 1 and 2) based on the 5A's by a female counsellor and 4 pregnancy brochures *Outcomes:* ≥ 60 days post randomisation (not clear if PP or cont) *Validation:* Salivary cotinine *Quality:* + Note: $25 gift certificate after each assessment
Pbert et al 2004 A, USA	*Participants:* 392 smokers *Interventions:* Aimed at staff – to provide 4A support and booklets, elicit commitment to quit (Intensity 2) *Control procedure:* usual care (no training) *Outcomes:* 7-day PP pre-delivery (mixed with 1-M post-deliver 30-days) and 6M post-partum 7-day PP *Validation:* Salivary cotinine, but inconsistent *Quality:* - Note: Cluster randomised. Unclear who provided intervention
Pbert et al 2004 B, US	*Participants:* 158 ex-smokers *Interventions:* Aimed at staff – to provide 4A support and booklets, elicit commitment to maintain abstinence (Intensity 1) *Control procedure:* usual care (no training) *Outcomes:* 7-day PP pre-delivery (mixed with 1-M post-deliver 30-days) and 6M post-partum *Validation:* Salivary cotinine at pre-delivery, not used consistently *Quality:* - *Note:* Same paper as above. Results strange, no effect 6M after intervention, but another 6M later there was an effect
Petersen et al 1992 US	*Participants:* 1,439 current and recent smokers (quit in previous 3 months) *Intervention:* Pregnancy-specific self-help manual, audiotape on safe aerobic exercise. (Intensity 1) *Control procedure*: Routine obstetric care, mailed list of community-based smoking cessation resources and pregnancy-related materials *Outcomes:* Mid pregnancy and 6 month postpartum (not clear if PP or cont)

	Validation: Validation inconsistent Quality: -
Polanska et al 2004, USA	*Participants:* smokers or recently quit (within the month) *Interventions:* 4 home visits by MW (with offer of extending to further 5 visits if not successfully abstinent on fourth visit) plus written materials and final visit post-delivery. (Intensity 3) *Control procedure:* Standard written materials about the health risks of smoking on the foetus plus MW home visit post-delivery *Outcomes:* Smoking status shortly after delivery (not clear it PP or cont) *Validation:* None *Quality:* - Note: Cluster randomised, data difficult to extract
Pollak et al 2007, USA	*Participants:* 181 smokers *Interventions:* CBT provided by support specialists (five face-to-face visits and one via telephone 48 hours after quit date) plus quit kit plus NRT (patch, lozenge or gum) (Intensity 5) *Control procedure:* Same support but no NRT *Outcomes*: 7-day PP at 7 weeks post randomisation and 3 months postpartum *Validation:* salivary cotinine at all time points (paid $10 for each sample) *Quality:* +
Ratner et al, 2000	*Participants:* 251 post partum ex-smokers *Intervention:* Counselling session in hospital by trained nurse counsellors + 8 telephone (weekly for 1 month and biweekly for 2 months) (Intensity 4) *Control procedures:* Usual care *Outcomes*: Continuous abstinence at 12 months post partum *Validation*: CO validation only for those interviewed in person *Quality:* -
Reading et al 1982, UK	*Participants:* 129 smokers *Interventions:* Real-time ultrasound high feedback (mothers could see image) (Intensity 1) (unclear who carried out intervention) *Control procedure:* low feedback *Outcomes:* asked at 16 week ultrasound appointment if any health behaviours have changed since the last visit *Validation:* None

	Quality: - Note: No baseline details given on smoking status
Reitzel 2010, US	*Participants:* 251 ex-smokers *Interventions:* 3 clinic visits (30-33 weeks pregnant, week 8 and 26 postpartum) and given incentives ($40) at each visit, self help materials, 5-10 mins of RP counselling and either a) 6 telephone calls or b) all of the above plus 2 in-person counselling sessions (Intensity 5). Research personnel with Tobacco Treatment Specialist (TTS) training provided the brief intervention (Intensity 1 and 2) (usual care). Master's or doctoral-level couselors received MI, TTS and MAPS/MAPS+ protocol training *Control procedure:* Usual care *Outcomes:* Continuous abstinence at 26 weeks post partum *Validation:* CO validated *Quality:* ++
Rigotti et al 2006, US	*Participants:* 442 smokers *Interventions:* Proactive telephone counselling (delivered by a trained counsellor) during pregnancy and over 2-months post-partum (mean of 5 calls totalling 68 minutes) + targeted self-help materials (Intensity 4) *Control procedure:* One brief counselling call by trained counsellor+ self-help material *Outcomes:* Self-reported abstinence (7-day pp) at the end of pregnancy and 3-months post partum. Sustained abstinence (abstinent at end of pregnancy and 3-months) *Validation:* Salivary cotinine *Quality:* + Note: Authors excluded 21 women from analyses because they miscarried
Ruger et al, 2008	*Participants:* 57 ex-smokers *Interventions:* Motivational Interviewing at home visits (average 3) with self-help materials (Intensity 5) Intervention given during pregnancy *Control procedure:* Usual care *Outcomes:* 6 months postpartum *Validation:* none *Quality:* - Note: Timing of home visits and who provided intervention is not clear
Secker-Walker et al 1994, US	*Participants:* 600 smokers *Interventions:* Session with a trained health educator. Follow-up at 2nd antenatal clinic, 36 week and 6 week post-partum (Intensity 5) *Control procedures:* Usual care

	Outcomes: 36 weeks' gestation (not clear if PP or cont) *Validation*: Cotinine validated in only a subsample Quality: - Notes: Lumley data extraction used as paper could not be accessed.
Secker-Walker et al 1995, US	*Participants:* 175 ex-smokers *Intervention:* Individual counselling with health educator. Follow-up at 2nd prenatal visit, 36w and 6w postpartum plus booklet (intensity 5) *Control procedures:* Usual care *Outcomes:* 36 week pregnancy and 6w postpartum (not clear if PP or cont) *Validation:* Cotinine only at 36w pregnancy *Quality:* +
Secker-Walker et al 1997, US	*Participants:* 60 smokers *Interventions:* Brief intervention from obstetrician/MW and tip-sheet plus a video-tape showing the experience of 4 female smokers going through the quitting process (n=30) (Intensity 1) *Control procedure:* Brief intervention (Intensity 1 and 2) from an obstetrician/MW and tip-sheet only (n=30) *Outcomes:* Self-reported smoking status at 36 weeks (not clear if PP or cont) *Validation:* CO *Quality:* +
Secker-Walker et al 1998, US	*Participants:* 116 ex-smokers *Interventions:* Structured intervention from physician, individual counselling from nurse at 1st, 2nd, 3rd, 5th and 36w prenatal visits (Intensity 5) *Control procedure:* Brief intervention (Intensity 1 and 2) from physician *Outcomes:* Sustained abstinence from the 2nd prenatal visit to 36w of pregnancy and 1 year postpartum *Validation:* CO and urine cotinine at 36w *Quality:* ++
Severson et al (1997)	*Participants*: 1026 mothers who were ex-smokers *Intervention:* Information pack including a letter from paediatrician and extended support (counselling plus FU at 2, 4 and 5m visits by paediatricians) and materials (Intensity 5) *Control procedures*: Information pack only *Outcomes:* Sustained abstinence at 12 months (PP at 6 and 12month)

	Validation: None *Quality*: -
Sexton et al 1984, US	*Participants:* 935 smokers recruited from 52 obstetric providers *Interventions:* At least one face-to-face visit with a trained advisor (one had experience in pregnancy counselling one with experience in smoking intervention) + monthly phone calls and mail contacts (included homework assignments) (Intensity 4) *Control procedure:* Usual care (not specified) *Outcomes:* 8th month of pregnancy (not clear if PP or cont) *Validation:* None *Quality:* -
Solomon et al (2000), US	*Participants:* 171 smokers recruited from a large obstetric practice *Interventions:* Brief cessation advice from an obstetrician/midwife + written materials, plus telephone support delivered by an ex-smoker on a weekly basis (n=77) (Intensity 4) *Control procedure:* Brief cessation advice from an obstetrician/MW + written materials at first 3 prenatal visits (n=74) *Outcomes:* 7 day PP at week 34 *Validation:* Urinary cotinine *Quality:* + Note: Only 53% of women in the intervention group actually received the calls. Those who did receive calls had 13 on average.
Stotts et al (2002), US	*Participants:* 269 women smoking in week 28 of pregnancy. *Interventions:* Stage of Change-based personalized feedback letter and two sessions of MI delivered via telephone by trained counsellors and Nurse-educators within weeks 28-30 of pregnancy (Intensity 4) *Control procedure:* Usual care *Outcomes:* 34 weeks post partum (not clear if PP or cont) *Validation:* Urinary cotinine at week 34, not with all self-reported abstainers *Quality:* - Note: Mixed non-smokers and light smokers in outcome measures. Urine samples only available for 175 women
Strecher et al (2000), US	*Participants:* 173 smokers recruited from two obstetric clinics *Interventions:* Series of tailored computer generated messages based on answers to questionnaires, sent through the mail (one after each prenatal visit) (n=88) (Intensity 1) *Control procedure:* Self-help guide to quitting smoking (n=85) *Outcomes:* 24 weeks gestation and 12 weeks post partum (not clear if PP or cont)

	Validation: urinary cotinine *Quality:* - Note: There appear to be a number of errors in this paper, the numbers do not tally. Unsure who provided intervention.
Tappin et al (2000), UK	*Participants:* 100 smokers *Interventions:* MI (2-5 sessions, time over which these occurred is not stated) delivered at women's homes by a MW (Intensity 5) *Control procedure:* Usual care *Outcomes:* late pregnancy (not clear if PP or cont) *Validation:* Serum cotinine *Quality:* +
Tappin et al (2005), UK	*Participants:* 762 smokers *Interventions:* MI (2-5 sessions of 30 minutes) delivered at women's homes by a MW (n=351) (Intensity 5) *Control procedure:* Usual care (advice from MW plus booklet providing information on smoking in pregnancy n=411) *Outcomes:* Quitting defined as self report plus cotinine concentrations of < 13.7 ng/ml serum or < 14.2 ng/ml saliva at 36 weeks (not clear if PP or cont) *Validation:* Plasma or salivary cotinine *Quality:* +
Thornton et al 1997, UK	*Participants:* 418 pregnant women currently smoked or had recently quit *Intervention*: Routine advice from MW and obstetricians plus one-to-one counselling by a trained facilitator, invited to join a stop smoking support group, partner invited, CO monitoring (Intensity 5) *Control procedure*: Routine prenatal advice *Outcomes*: At delivery and 3 months postpartum (not clear if PP or cont) *Validation*: CO *Quality*: + *Notes*: Lumley data extraction used as paper could not be accessed. Timing of intervention is not clear.
Tsoh et al 2010, US	*Participants:* 42 smokers *Interventions:* 15 minute Video Doctor program (designed to simulate discussion with a prenatal HCP) + provider cueing sheet and educational worksheet for participant (Intensity 3) *Control procedure:* Usual care

	Outcomes: 30 day abstinence at 2 month FU *Validation:* None *Quality:* - Note: All participants received gift cards at baseline, 1 and 2 months FU ($30, £40 & $50)
Valbo et al 1991, Norway	*Participants:* 200 smokers *Interventions:* (I1) Smoking cessation group of 6 x 2hr sessions over 5 weeks delivered by a Clinical Psychologist (n=50) (Intensity 5); (I2) Information delivered from a doctor during a 1-hour session (Intensity 1); (I3) Pamphlet on risks of smoking and advice to quit (n=50) (Intensity 5) *Control procedure:* No advice (n=50) *Outcomes:* 7-day PP at 12 months post partum *Validation:* None *Quality:* -
Valbo et al 1994, Norway	*Participants:* 112 pregnant smokers *Interventions:* Self-help manual for 10-day program. 2 week reminder, 32 week scan + reinforcement by obstetrician or MW (Intensity 5) *Control procedure:* Information and encouragement to quit plus pamphlet by obstetrician or MW *Outcomes:* Late pregnancy (not clear if PP or cont) *Validation:* None *Quality:* - *Notes*: Lumley data extraction used as paper could not be accessed.
Valbo et al 1996, Norway	*Participants:* 158 smokers *Interventions:* Two hypnosis sessions (45 minutes each) over 2 weeks delivered by anaesthesiologist (n=52) (Intensity 3) *Control procedure:* Routine care (n=78) *Outcomes:* Continuous abstinence from 'quit day' at delivery. *Validation:* None *Quality:* - Note: 80 women were randomised to the intervention, but only 52 participated (13 did not get an appointment in time and 15 did not attend).
Van't Hof et al 2000, US	*Participants:* 287 mothers identified as non-smokers at time of delivery *Interventions:* nurse counselling (15-30mins) at 2 week, 2 and 4 month well baby clinic visits (Intensity 5)

	Control procedure: Usual care from paediatric provider *Outcomes:* 7-day PP at 6 months *Validation:* None *Quality:* -
Wall et al 1995, US	*Participants:* 2901 mothers who reported smoking in the month prior to getting pregnant *Interventions:* leaflet packs and personalised letter from paediatrician + group counselling by paediatrician at well baby visits at 2 weeks, 2, 4 and 6 months (4 in total) + watching a videotape (Intensity 5) *Control procedure:* leaflet packs + personalised letter from paediatrician only *Outcomes:* 7-day PP at 6 months *Validation:* None *Quality:* -
Walsh et al 1997, Australia	*Participants:* 253 smokers *Interventions:* Advice from a doctor; information video; 10 minutes MW counselling, self-help manual, then 3 follow-up MW visits and brief risk advice from doctor, enrolment in lottery for confirmed abstainers at second visit and invitation for adult to attend program with patient (Intensity 4) *Control procedure:* Brief intervention (Intensity 1 and 2) from a doctor and midwife plus anti-smoking materials *Outcomes:* 34th week of gestation and 6-12 weeks post-partum (not clear if PP or cont) *Validation:* Urinary cotinine *Quality:* + Note: Ns unclear
Windsor et al 1985, US	*Participants:* 309 smokers *Interventions:* (1) 10 minute skills counselling session (delivered by health educators) + generic self-help guide + booklet (n=103) (Intensity 1); (2) 10 minute skills counselling session + pregnancy specific self-help guide +booklet (Intensity 1) *Control procedure:* Usual care (2-3 minutes within a group prenatal education session at 1st visit) *Outcomes:* 7-day PP at mid and end of pregnancy *Validation:* Salivary thiocyanate *Quality:* + Note: Unclear if Ns reported are at mid-pregnancy, end of pregnancy or both
Windsor et al 1993, US	*Participants:* 994 smokers *Interventions:* Brief nurse advice to quit, an initial 15 min counselling session (delivered

	by a health counsellor) + self-help material (2 pamphlets), two follow-up visits (timing not specified), one of which included the provision of social support methods (a buddy letter, a buddy contract, and a buddy tip sheet) + quarterly newsletter with quitter testimonials (Intensity 5) *Control procedure:* Brief nurse advice to quit and self-help material *Outcomes:* Mid-pregnancy (4-8 weeks after 1st visit) and after 32 weeks gestation (not clear if PP or cont) *Validation:* Salivary cotinine *Quality:* + Note: Only one follow-up visit was given to women who enrolled late in pregnancy.
Windsor et al 2000, UK	*Participants:* 265 smokers *Interventions:* Video + guide to quitting smoking and a < 5 min counselling session . Patient education methods delivered by trained regular staff members (Intensity 1) *Control procedure:* Risk education and advised to stop smoking *Outcomes:* The first pre-natal visit after consent (not clear if PP or cont) *Validation:* Salivary cotinine (not clear if used in calculating success rate) *Quality:* -
Winickoff et al 2010, US	*Participants:* 101 parents (mix baseline ex-smokers and smokers, and mothers and fathers) *Interventions:* In-hospital counselling by trained study staff + quitline referral + letter to the newborn's paediatrician, parents primary care provider and mothers obstetrician recommending strategies to facilitate cessation (Intensity 1) *Control procedure:* Usual care *Outcomes*: 7-day PP at 3 months post-partum, PP *Validation:* Saliva swab (for cotinine analysis) mailed to participants *Quality:* + Note: $50 given as an incentive to return saliva swabs. For review 3 paper reports that hospital retained the question about fathers smoking status after the study finished because staff found it useful.
Wisborg et al 2000, Denmark	*Participants:* 250 smokers *Interventions:* Nicotine (15mg/16hr for 8 weeks, 10mg/16hr for 3 weeks) + 4 prenatal clinic visits (or telephone contact if did not attend clinic) with MW delivered counselling + pamphlet (Intensity 5) *Control procedure:* Same support, placebo patches *Outcomes:* Continuous abstinence 4-weeks prior to delivery and one year post partum *Validation:* Salivary cotinine at 4th visit *Quality:* ++

SECTION 1: EFFICACY OF BEHAVIOURAL INTERVENTIONS DELIVERED DURING PREGNANCY

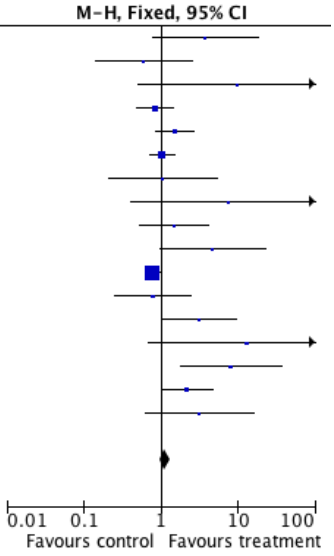
PART 1: INTERVENTION INTENSITY

Below we analyse all studies where more intensive behavioural support was compared with less intensive or no support. Drug trials where both study arms received the same intensity of behavioural support are analysed in Section 3. For each intensity of support, the results are presented separately for outcomes up to delivery, and outcomes post-delivery (usually from several months up to one year post-partum). We present the results of all the studies first, and follow this with a meta-analysis including only trials which validated self-reported abstinence biochemically. We also analysed separately studies in which interventions were delivered by midwives and those where the advisors had non-midwifery background.

Intensity 1 – Up to delivery

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Baric 1976	9	63	2	47	0.6%	3.75 [0.77, 18.25]
Bauman 1983	3	39	6	49	1.6%	0.60 [0.14, 2.56]
Dunkely 1997	4	50	0	50	0.2%	9.77 [0.51, 186.52]
Hajek a 2001	26	431	31	440	9.5%	0.85 [0.49, 1.45]
Hjalmarson 1991	56	492	18	231	7.2%	1.52 [0.87, 2.65]
Kendrick 1995	54	888	69	1177	18.4%	1.04 [0.72, 1.50]
Lowe a 1998	3	106	3	111	0.9%	1.05 [0.21, 5.31]
Lowe b 1998	4	59	0	47	0.2%	7.70 [0.40, 146.77]
Macarthur 1987	9	493	6	489	2.0%	1.50 [0.53, 4.24]
Mayer 1990	8	72	2	77	0.6%	4.69 [0.96, 22.87]
Moore 2002	156	724	207	803	50.9%	0.79 [0.62, 1.00]
Petersen 1992	6	43	8	47	2.2%	0.79 [0.25, 2.50]
Reading 1982	19	39	6	26	1.2%	3.17 [1.05, 9.58]
Secker-Walker 1997	5	30	0	30	0.1%	13.16 [0.69, 249.48]
Windsor 1985	14	102	2	104	0.6%	8.11 [1.79, 36.68]
Windsor 2000	24	139	11	126	3.2%	2.18 [1.02, 4.66]
Windsor b 1985	6	103	2	104	0.6%	3.15 [0.62, 16.01]
Total (95% CI)		**3873**		**3958**	**100.0%**	**1.12 [0.96, 1.31]**
Total events	406		373			

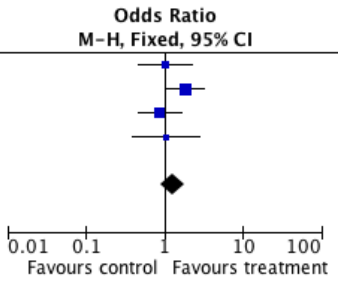
Heterogeneity: $Chi^2 = 38.29$, df = 16 (P = 0.001); $I^2 = 58\%$
Test for overall effect: Z = 1.43 (P = 0.15)



Intensity 1 – Post partum

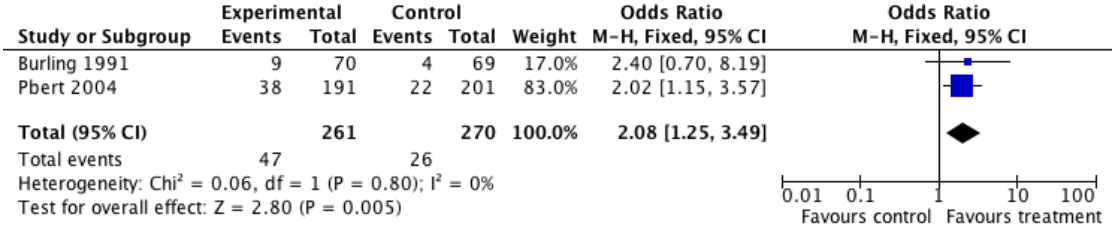
Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Hajek a 2001	13	431	13	440	20.0%	1.02 [0.47, 2.23]
Hjalmarson 1991	70	492	19	231	35.6%	1.85 [1.09, 3.15]
Petersen 1992	35	71	41	78	31.8%	0.88 [0.46, 1.67]
Strecher 2000	10	104	8	87	12.6%	1.05 [0.40, 2.79]
Total (95% CI)		**1098**		**836**	**100.0%**	**1.27 [0.91, 1.78]**
Total events	128		81			

Heterogeneity: $Chi^2 = 3.63$, df = 3 (P = 0.30); $I^2 = 17\%$
Test for overall effect: Z = 1.42 (P = 0.15)

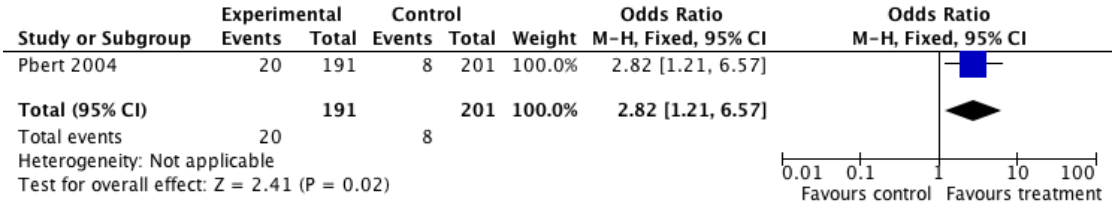


One-off interventions accompanied by written and other materials lack efficacy.

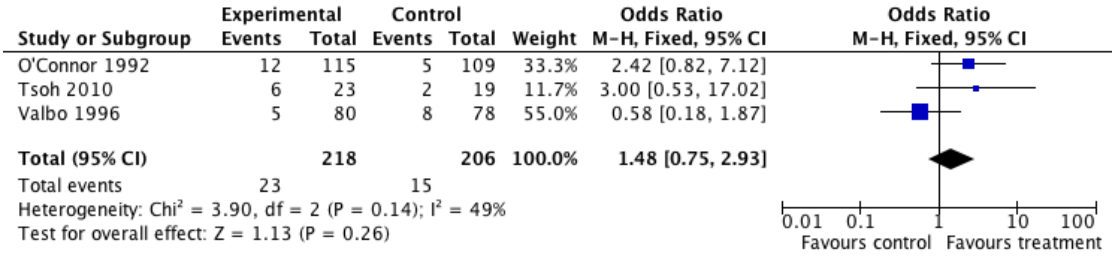
Intensity 2 – Up to delivery



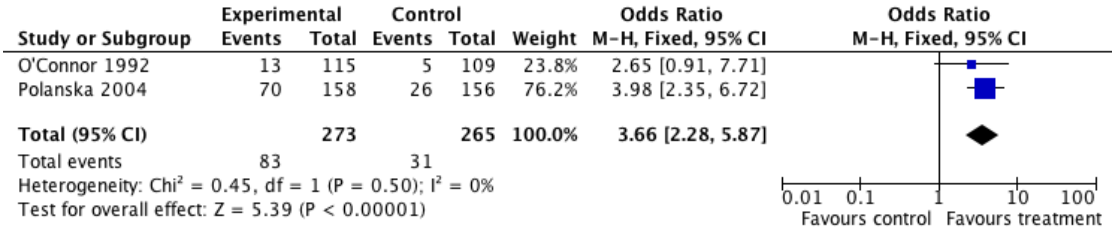
Intensity 2 – Post partum



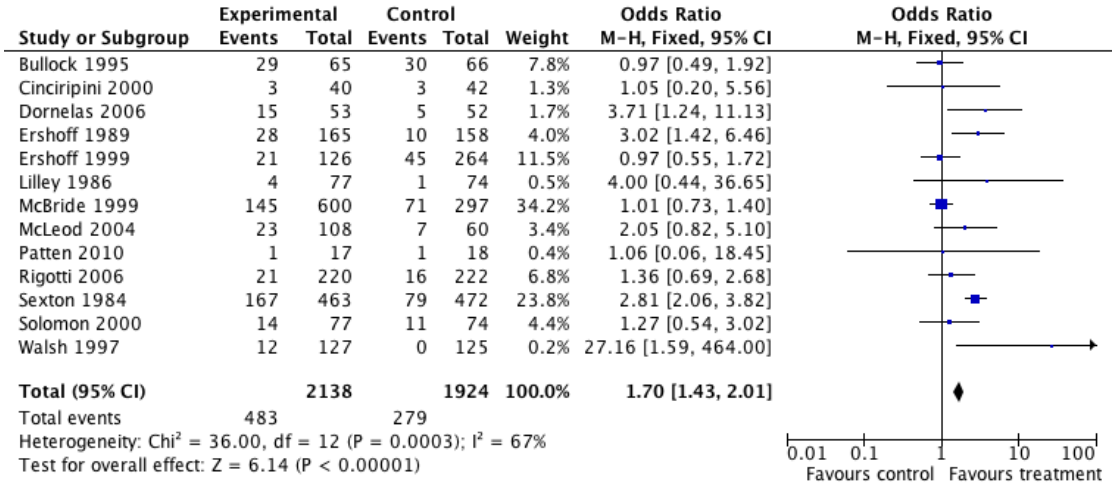
Intensity 3 – Up to delivery



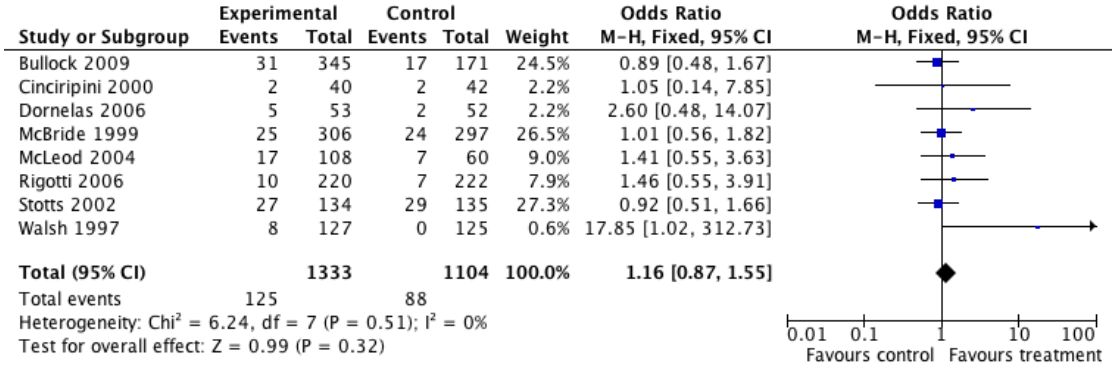
Intensity 3 – Post partum



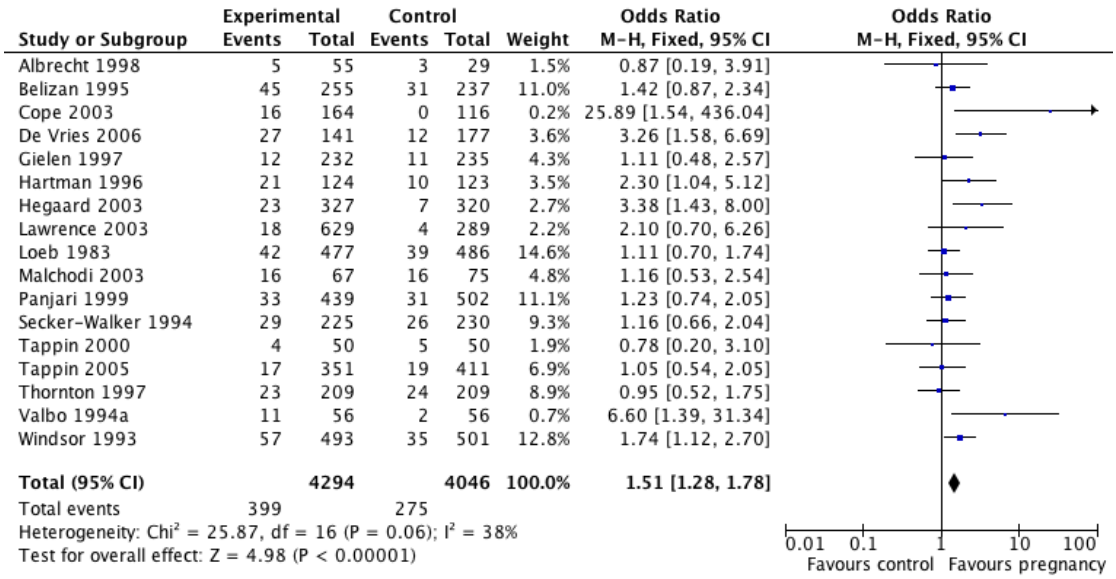
Intensity 4 – Up to delivery



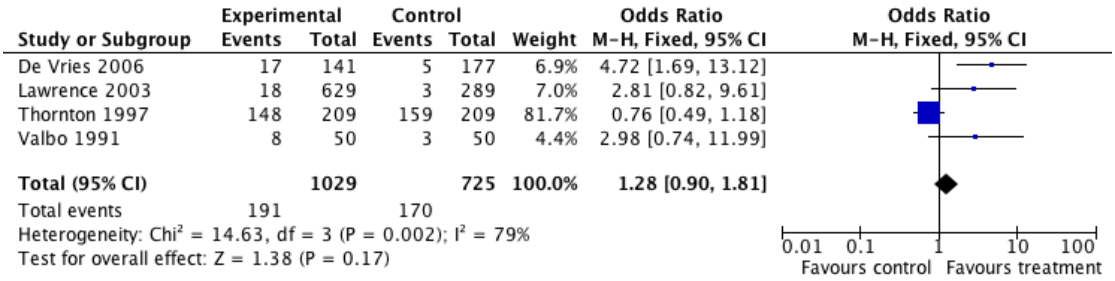
Intensity 4 – Post partum



Intensity 5 - Up to delivery



Intensity 5 – Post partum

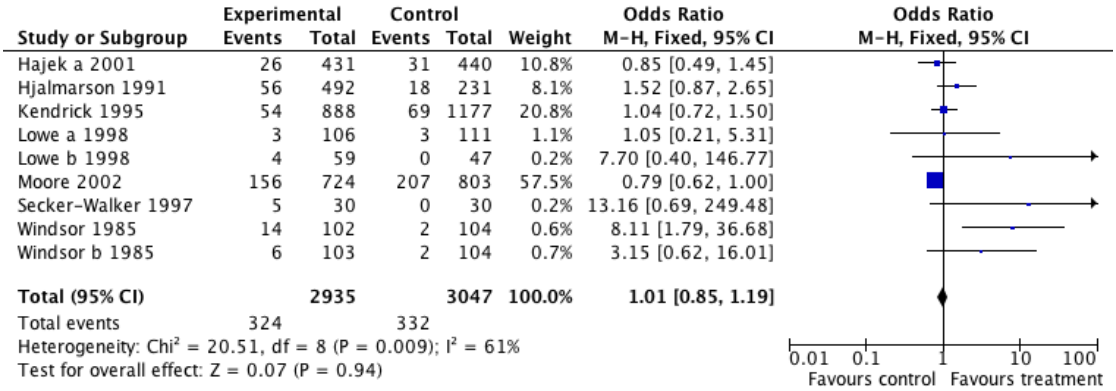


When all studies are included, apart from Intensity 1 (one-off interventions accompanied by written materials or videos), all intensities of intervention had a significant impact up to delivery. With the exception of Intensity 2 where a single study (Pbert et al 2004 [RCT -]) reported a significant result, no pooled results showed efficacy post-partum.

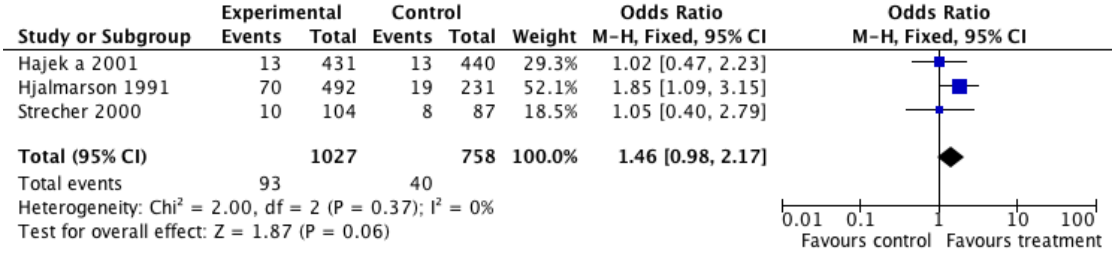
Results of studies that validated self-reported abstinence

Below are analyses including only studies that validated self-reported abstinence biochemically.

Intensity 1 – Validated – Up to delivery



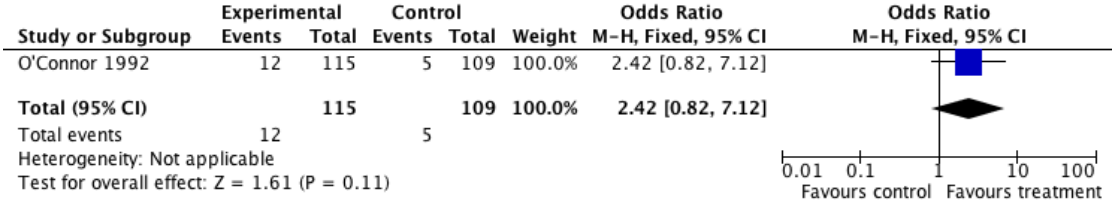
Intensity 1 – Validated – Post partum



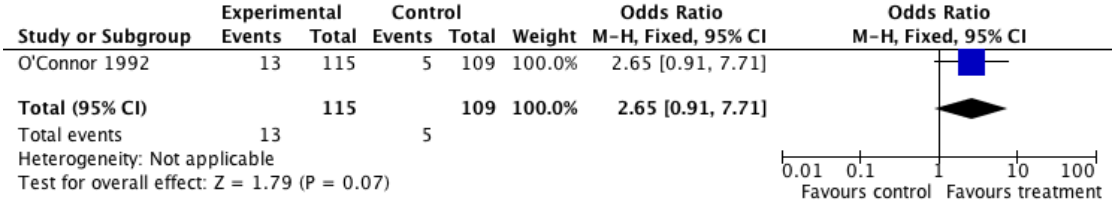
Intensity 2 - Validated

There were no studies of this kind.

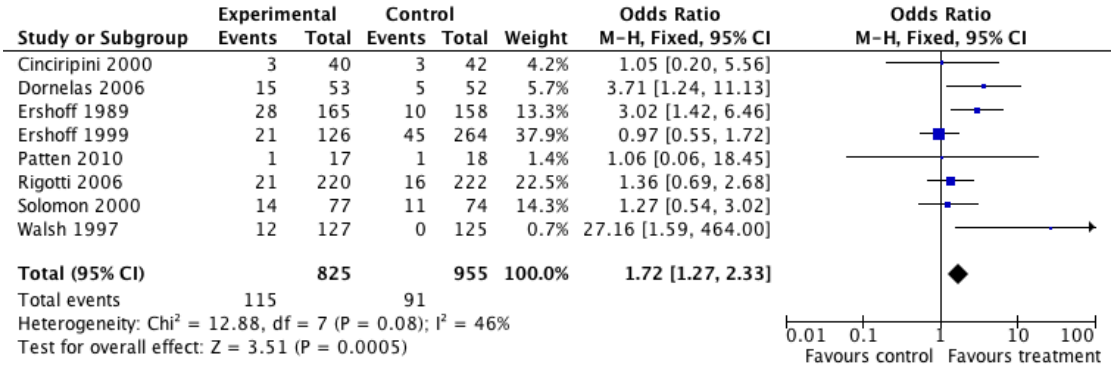
Intensity 3 – Validated – Up to delivery



Intensity 3 – Validated – Post partum



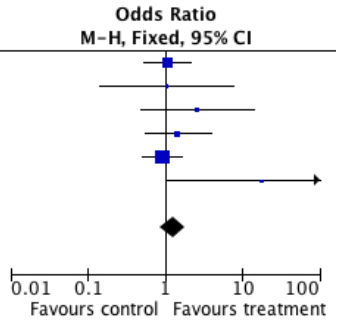
Intensity 4 – Validated – Up to delivery



Intensity 4 – Validated – Post partum

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Bullock 2009	19	179	17	171	31.5%	1.08 [0.54, 2.15]
Cinciripini 2000	2	40	2	42	3.8%	1.05 [0.14, 7.85]
Dornelas 2006	5	53	2	52	3.7%	2.60 [0.48, 14.07]
Rigotti 2006	10	220	7	222	13.5%	1.46 [0.55, 3.91]
Stotts 2002	27	134	29	135	46.7%	0.92 [0.51, 1.66]
Walsh 1997	8	127	0	125	1.0%	17.85 [1.02, 312.73]
Total (95% CI)		**753**		**747**	**100.0%**	**1.27 [0.88, 1.85]**
Total events	71		57			

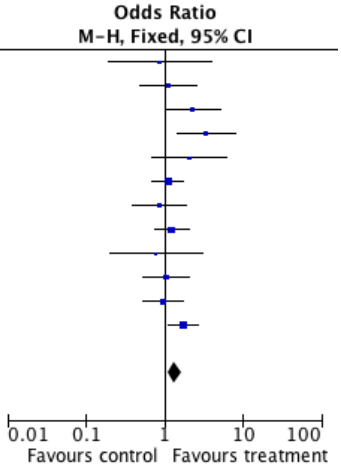
Heterogeneity: $Chi^2 = 5.44$, df = 5 (P = 0.36); $I^2 = 8\%$
Test for overall effect: Z = 1.26 (P = 0.21)



Intensity 5 - Validated – Up to delivery

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Albrecht 1998	5	55	3	29	2.0%	0.87 [0.19, 3.91]
Gielen 1997	12	232	11	235	5.7%	1.11 [0.48, 2.57]
Hartman 1996	21	124	10	123	4.6%	2.30 [1.04, 5.12]
Hegaard 2003	23	327	7	320	3.6%	3.38 [1.43, 8.00]
Lawrence 2003	18	629	4	289	2.9%	2.10 [0.70, 6.26]
Loeb 1983	42	477	39	486	19.3%	1.11 [0.70, 1.74]
Malchodi 2003	16	75	16	67	7.3%	0.86 [0.39, 1.90]
Panjari 1999	33	439	31	502	14.6%	1.23 [0.74, 2.05]
Tappin 2000	4	50	5	50	2.5%	0.78 [0.20, 3.10]
Tappin 2005	17	351	19	411	9.1%	1.05 [0.54, 2.05]
Thornton 1997	23	209	24	209	11.7%	0.95 [0.52, 1.75]
Windsor 1993	57	493	35	501	16.8%	1.74 [1.12, 2.70]
Total (95% CI)		**3461**		**3222**	**100.0%**	**1.34 [1.11, 1.63]**
Total events	271		204			

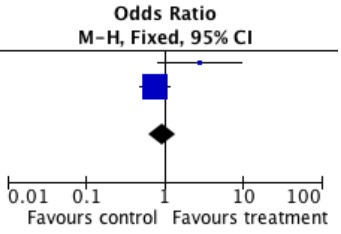
Heterogeneity: $Chi^2 = 13.01$, df = 11 (P = 0.29); $I^2 = 15\%$
Test for overall effect: Z = 3.03 (P = 0.002)



Intensity 5 - Validated– Post partum

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Lawrence 2003	18	629	3	289	7.9%	2.81 [0.82, 9.61]
Thornton 1997	148	209	159	209	92.1%	0.76 [0.49, 1.18]
Total (95% CI)		**838**		**498**	**100.0%**	**0.93 [0.62, 1.38]**
Total events	166		162			

Heterogeneity: $Chi^2 = 3.88$, df = 1 (P = 0.05); $I^2 = 74\%$
Test for overall effect: Z = 0.38 (P = 0.70)

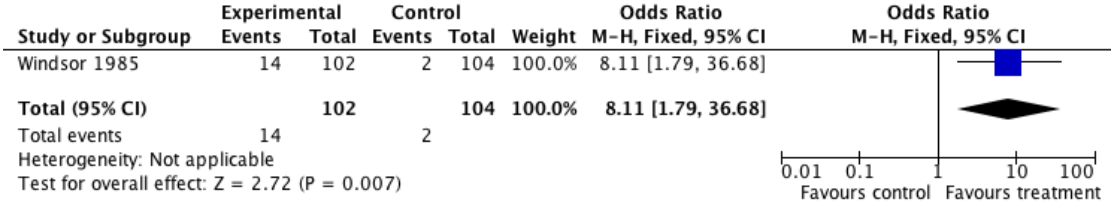


In studies that validated self-reported abstinence, brief one-off interventions (Intensity 1) and intervention with follow-up of up to 4 weeks (Intensity 3) were not effective during pregnancy or post-delivery. Interventions of Intensity 4 and Intensity 5, which provided support for longer than four weeks were effective during pregnancy but not post-partum.

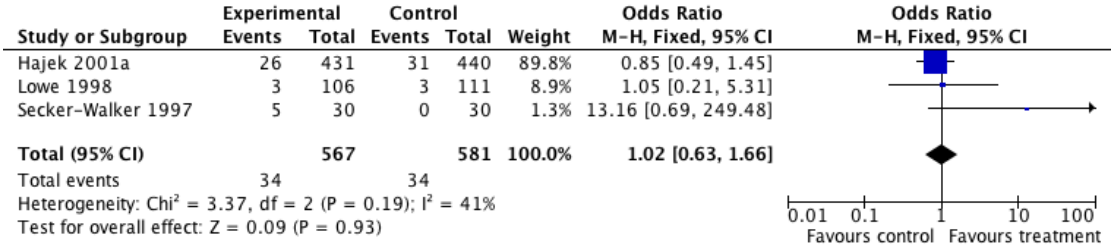
Background of advisors delivering the interventions

We compared validated studies evaluating interventions delivered by midwives and those delivered by advisors other than midwives.

Non-midwife - Intensity 1

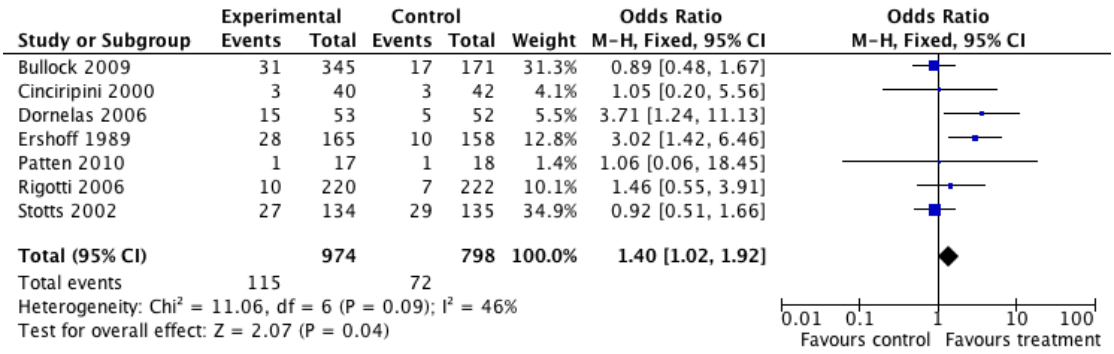


Midwife– Intensity 1

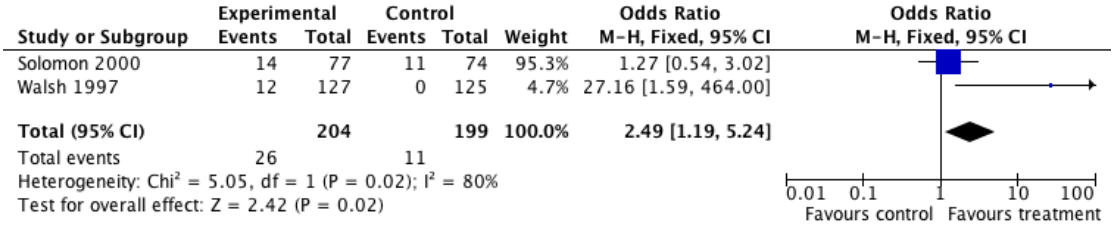


There were no eligible validated trials of Intensity 2 and no eligible MW interventions of Intensity 3

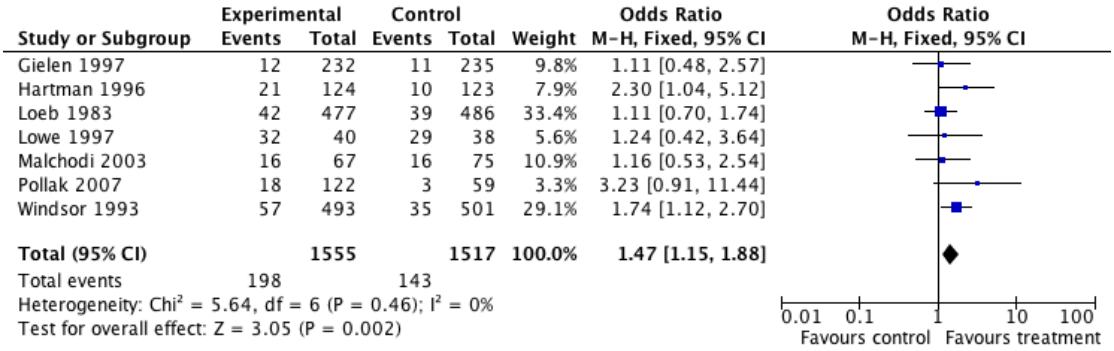
Non-midwife - Intensity 4



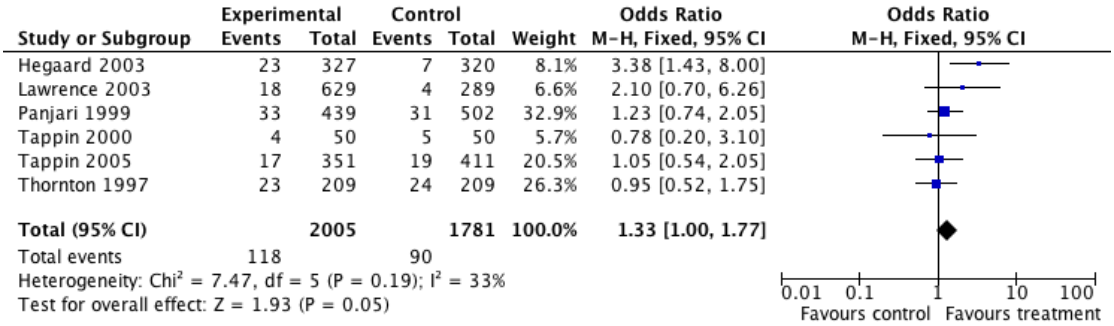
Midwife – Intensity 4



Non-midwife - Intensity 5



Midwife - Intensity 5



Intensity 1 interventions are ineffective and Intensity 4 and 5 interventions are effective regardless of the background of the advisors.

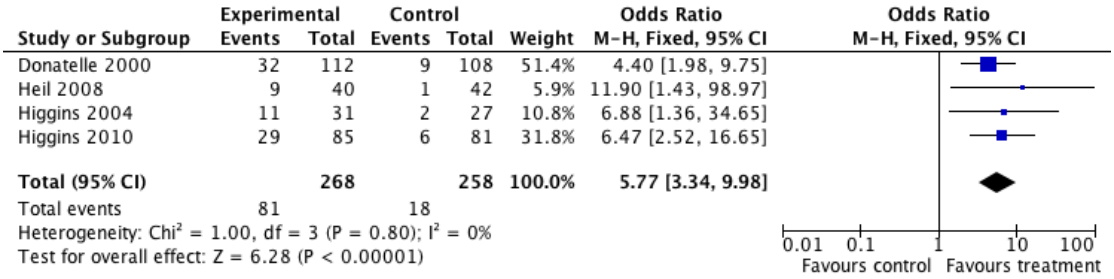
SECTION 1A: EFFECTS OF INCENTIVES

We analysed separately studies evaluating the effects of incentives as the presumed active ingredient in such interventions is different from the presumed active ingredient of other behavioural interventions.

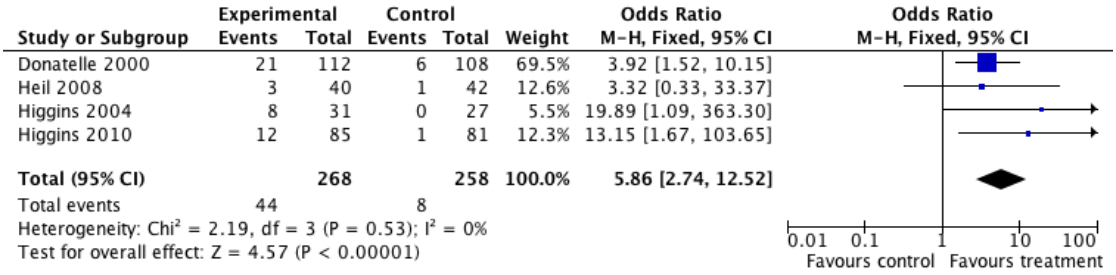
There were 4 US studies examining the effects of incentives contingent on abstinence. All validated self-reported abstinence biochemically. The interventions used incremental reinforcement schedules where women attended frequent check-ups with biochemical validation, and received increasing rewards that were re-set following lapses back to smoking. In three of the studies, the total rewards a woman could accumulate exceeded $1,000.

We extracted data concerning effects during pregnancy, post-delivery, and also at least one month after the incentive scheme was discontinued.

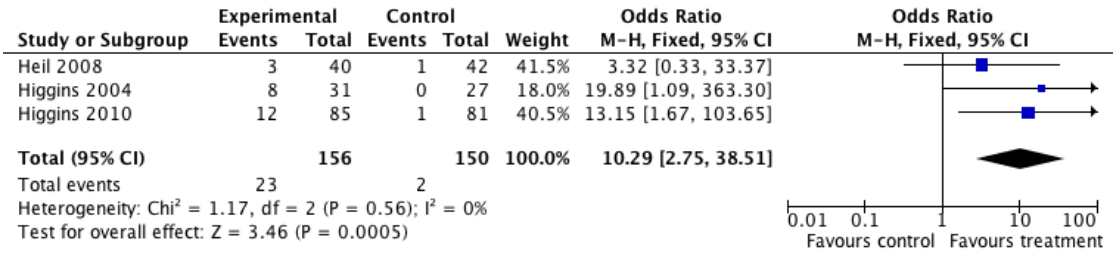
Effects of incentives - up to delivery



Effects of incentives - post-partum



Effects of incentives - after the scheme was discontinued



The provision of incentives contingent on abstinence was effective in increasing cessation rates both pre-delivery and post-partum, and the effect was maintained after the incentives were discontinued.

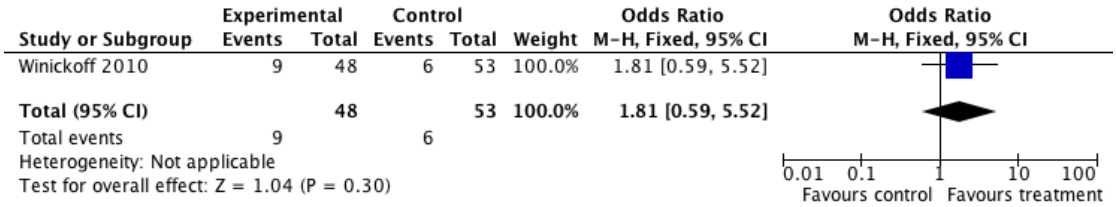
SECTION 1B: EFFICACY OF INTERVENTIONS TARGETING PARTNERS

We found only one study of stop-smoking intervention targeting partners of pregnant women (De Vries et al. 2006, [RCT -]). The study write-up does not allow data extraction, but the authors report that the intervention had no effect. Three other studies involved partners. Lilley et al. 1986 [RCT -] used leaflets directed at both the woman and her partner. Lowe et al. 1998 [RCT +] used an intervention which included a no-smoking contract between the woman and her partner. McBride et al. 2004 [RCT +] included partners as coaches and also provided support for partners who smoke. The studies do not allow data extraction on the partner component, but all three had overall negative results.

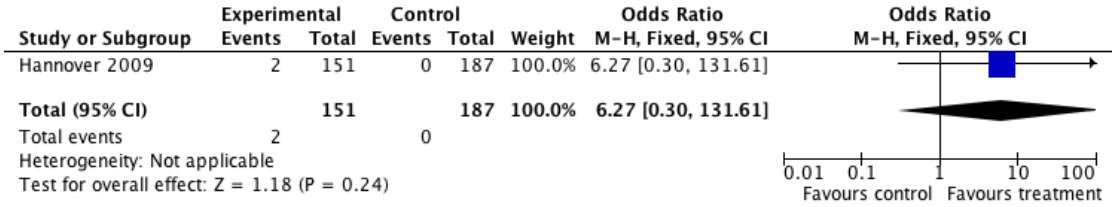
SECTION 2: EFFICACY OF INTERVENTIONS DELIVERED POST-PARTUM

Three trials studied interventions initiated after delivery. None of the trials validated self-reported abstinence.

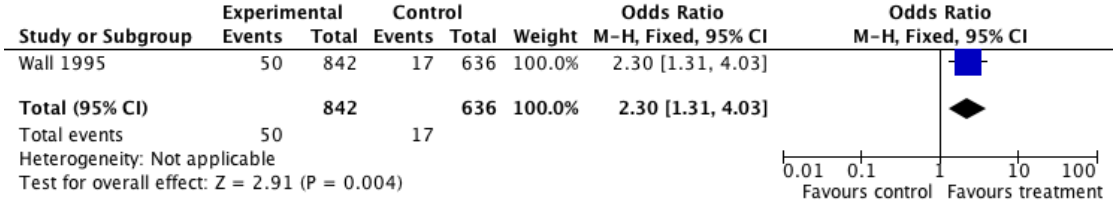
Intensity 1



Intensity 4



Intensity 5

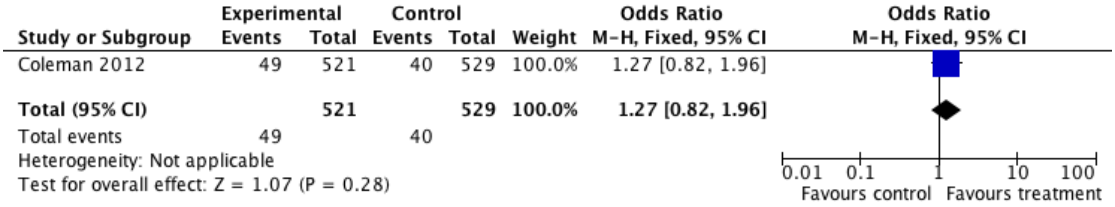


Only the Intensity 5 trial (Wall 1995, [RCT -]) showed a significant intervention effect.

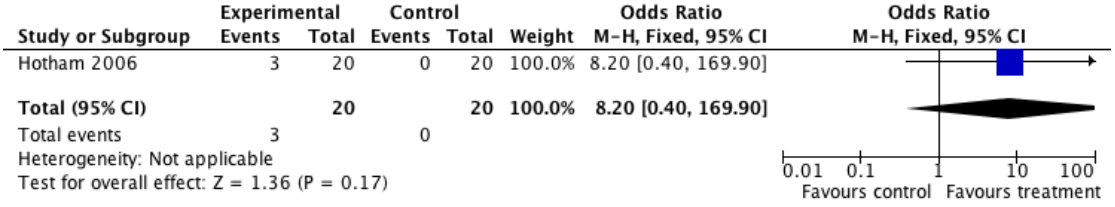
SECTION 3: EFFICACY OF PHARMACOTHERAPIES

Nicotine replacement therapy is the only treatment that has been evaluated for use in pregnancy so far. All the trials validated self-reported abstinence biochemically, though one (Wisborg et al 2000, [RCT ++]) which validated self-reported abstinence at earlier FU points did not do so at 1-year. Four trials used patches (Coleman et al 2012, [RCT ++]; Hotham et al 2006 [RCT ++]; Kapur et al 2001, [RCT +]; Wisborg et al 2000, [RCT ++]), one used gum (Oncken et al 1998, [RCT +]) and one used a choice between patch, gum or lozenge (Pollack 2007 et al, [RCT ++]).

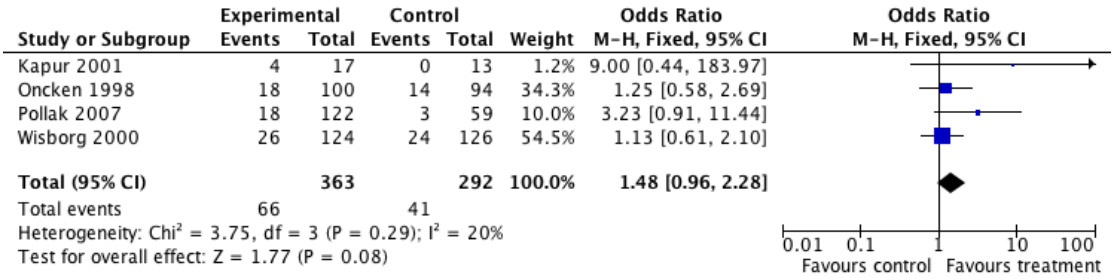
Intensity 3 – NRT effects during pregnancy



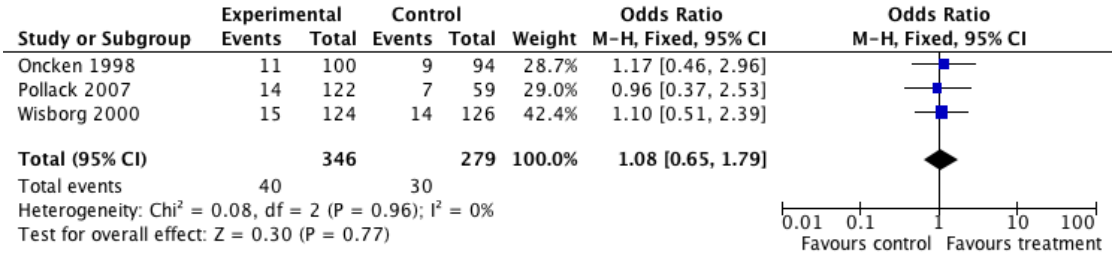
Intensity 4 – NRT effects during pregnancy



Intensity 5 - NRT effects during pregnancy



Intensity 5 – NRT effects post-partum



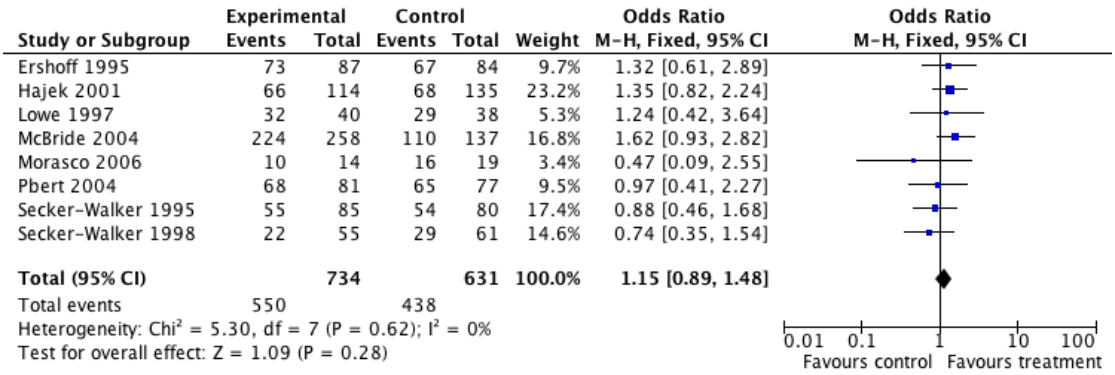
Nicotine replacement treatment did not show efficacy across the levels of support.

SECTION 4: EFFICACY OF INTERVENTIONS TO PREVENT RELAPSE

Fourteen studies focused on women who stopped smoking, with the aim of helping them to prevent relapse during and after pregnancy. We first pooled the studies according to the timing of the intervention and then analysed only studies which validated self-reported abstinence. Finally, we looked separately at interventions of different intensity.

Intervention delivered during pregnancy

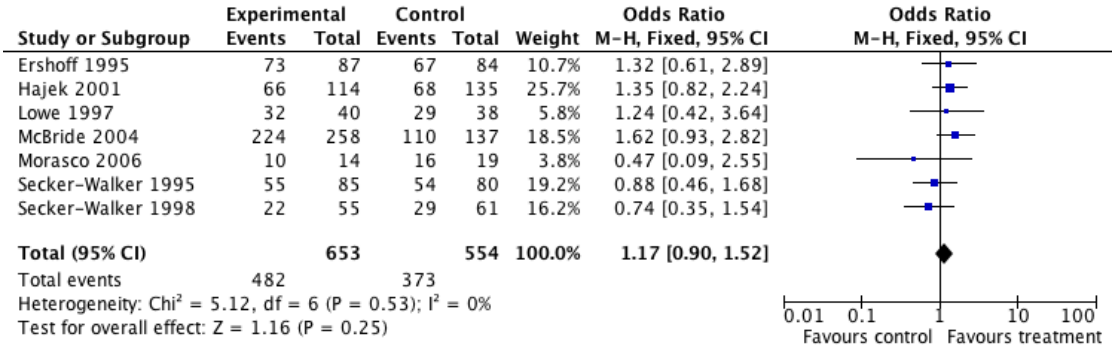
Intervention delivered during pregnancy, effects up to delivery



Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Ershoff 1995	73	87	67	84	9.7%	1.32 [0.61, 2.89]
Hajek 2001	66	114	68	135	23.2%	1.35 [0.82, 2.24]
Lowe 1997	32	40	29	38	5.3%	1.24 [0.42, 3.64]
McBride 2004	224	258	110	137	16.8%	1.62 [0.93, 2.82]
Morasco 2006	10	14	16	19	3.4%	0.47 [0.09, 2.55]
Pbert 2004	68	81	65	77	9.5%	0.97 [0.41, 2.27]
Secker-Walker 1995	55	85	54	80	17.4%	0.88 [0.46, 1.68]
Secker-Walker 1998	22	55	29	61	14.6%	0.74 [0.35, 1.54]
Total (95% CI)		**734**		**631**	**100.0%**	**1.15 [0.89, 1.48]**
Total events	550		438			

Heterogeneity: Chi² = 5.30, df = 7 (P = 0.62); I² = 0%
Test for overall effect: Z = 1.09 (P = 0.28)

Intervention delivered during pregnancy, effects up to delivery - Validated only



Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Ershoff 1995	73	87	67	84	10.7%	1.32 [0.61, 2.89]
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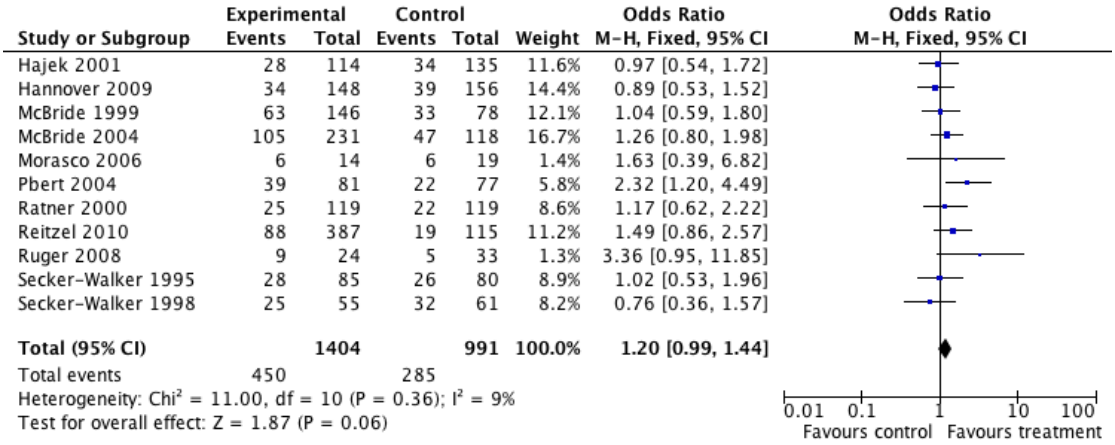
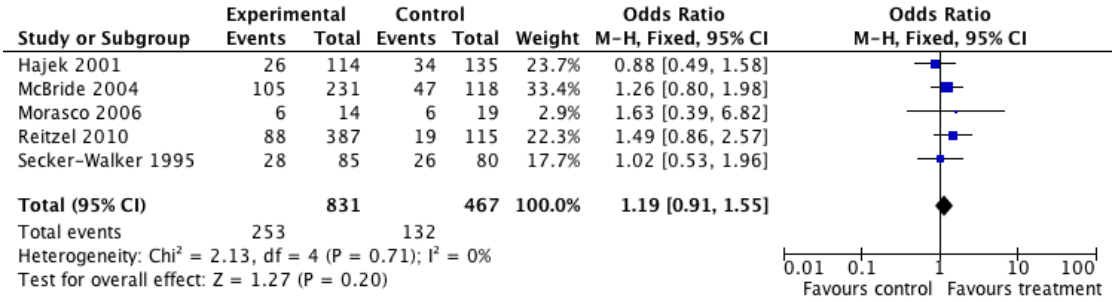
Secker-Walker 1995	55	85	54	80	19.2%	0.88 [0.46, 1.68]
Secker-Walker 1998	22	55	29	61	16.2%	0.74 [0.35, 1.54]
Total (95% CI)		**653**		**554**	**100.0%**	**1.17 [0.90, 1.52]**
Total events	482		373			

Heterogeneity: Chi² = 5.12, df = 6 (P = 0.53); I² = 0%
Test for overall effect: Z = 1.16 (P = 0.25)

Intervention delivered during pregnancy, effects post-partum

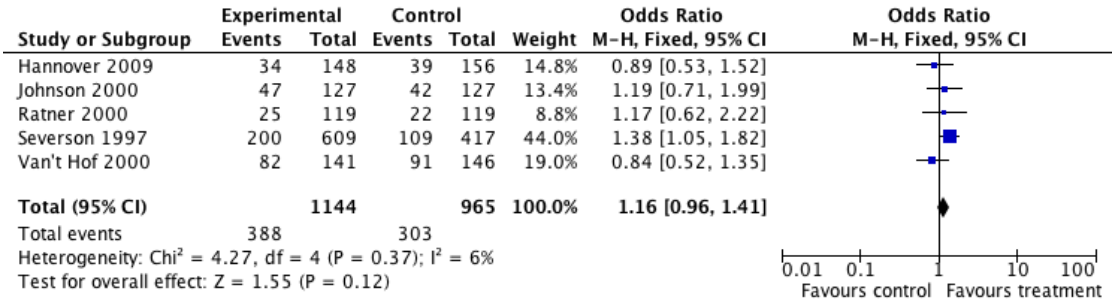


Intervention delivered during pregnancy, effects post-partum – Validated only

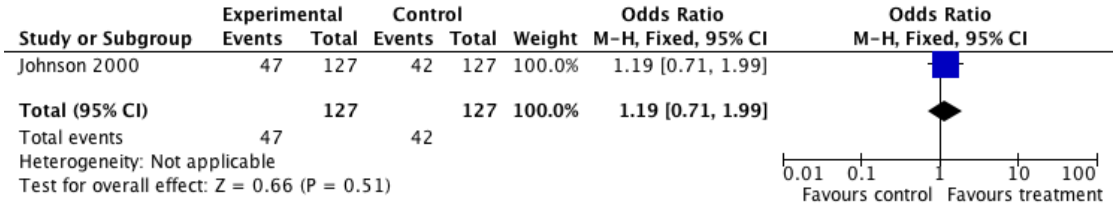


Intervention delivered post delivery

Interventions delivered post delivery, effects post-partum

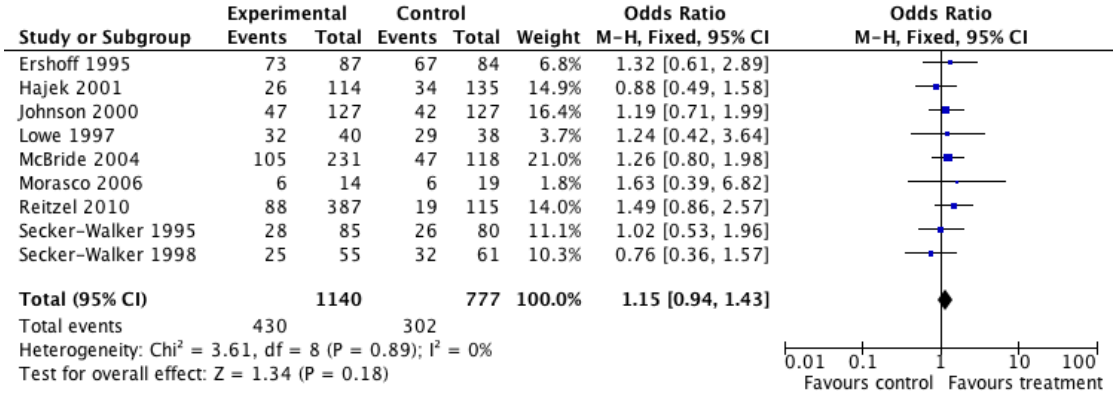


Interventions delivered post delivery, effects post-partum – Validated only

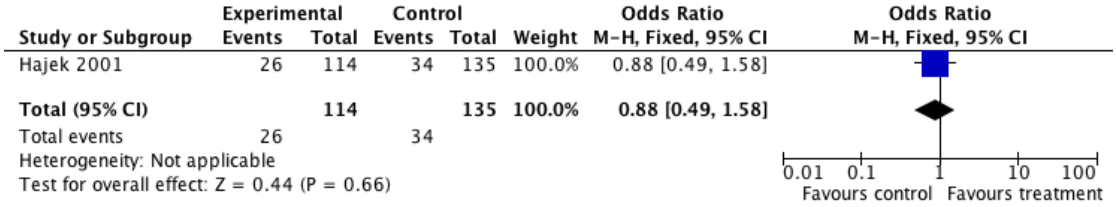


We repeated these analyses using validated studies only.

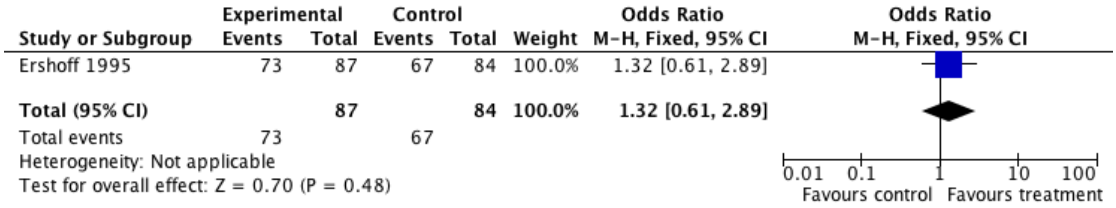
All validated studies



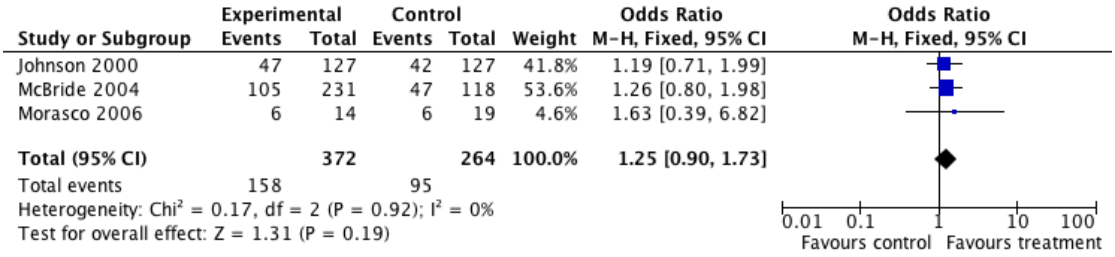
Validated studies of Intensity 1



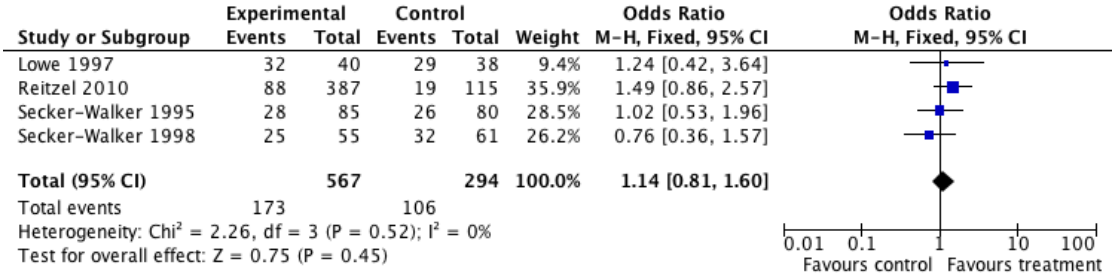
Validated studies of Intensity 3



Validated studies of Intensity 4



Validated studies of Intensity 5



Relapse prevention interventions with users of maternity service lack efficacy.

SYSTEMATIC REVIEWS:

We found two relevant Cochrane reviews. Lumley et al. (2009 [systematic review, +]) covers interventions with pregnant women and Hajek et al. (2009 [systematic review, ++]) covers relapse prevention interventions and includes a section on interventions with pregnant women. We also found one relevant report commissioned by NICE (Myers et al. 2009 [systematic review, ++]) on relapse preventions in pregnancy.

We identified 7 other reviews, listed below. All relevant and eligible studies included in these reviews are also included in our review.

Author	**Summary**
Dolan-Mullen et al 1994 Meta analysis	Review and meta-analysis of 10 randomised trials of prenatal smoking cessation interventions. Found a positive effect. *Quality: +*
Kelley et al. 2001 Meta analysis	Review of 36 studies assessing the effectiveness of prenatal interventions. Pooled 36 studies and concluded that interventions should employ further follow-up. *Quality: ++*
Melvin et al 2000 Review	General review of smoking cessation interventions during pregnancy quoting a meta-analysis by Mullen (1999) that pooled data from 16 trials and found a significant effect.

	Quality: -
Mullen 1999	Paper on order
Naughton et al 2008 Meta-analysis	Review and meta-analysis. Meta-analysis of 15 randomised and quasi-randomised controlled trials of self-help intervention in pregnancy, found a significant effect. *Quality: +*
Windsor et al 1998 Review	Review of 23 randomised and quasi-randomised trials of smoking cessation interventions in pregnant women, reports a significant effect. Quality: +
Lumley et al 2000(Walsh & Redman, 1993) Systematic Review	Cochrane review of the efficacy of smoking cessation interventions in pregnancy. 45 RCTs, pooled data from 34, showed a significant effect. Quality +
Walsh & Redman 1993 Review	Review of 20 trials of interventions to help pregnant women stop smoking, not pooled. Quality +

All the reviews above report positive results. The reviews were generally less strict in data extraction and in outcome definitions than our review and they report larger effects, especially for brief interventions (Intensity 1 and 2), but overall their conclusions generally tally with our findings.

NARRATIVE SUMMARY

INTERVENTION INTENSITY

As with hospital patients, a range of interventions aimed at users of maternity services has been proposed. Advice by midwives accompanied by leaflets is by far the simplest and least expensive option that could be provided routinely on a large scale. It has been evaluated in 20 randomised trials and pooling them together shows that such one-off interventions have little effect.

Pregnant smokers are likely to have received strong encouragements to stop smoking from their friends, families, and health care providers. Those who continue to smoke despite such advice may need more substantial assistance.

Interventions of Intensity 2 and 3 were evaluated in only a small number of trials. The results suggest that these are likely to have only limited, if any, effects. Interventions of Intensity 4 and 5 however show efficacy, although the effects are not maintained after delivery.

It is worth noting that unlike in studies of acute care interventions, there was no observable trend in favour of face-to-face contact compared to telephone support. This could be in part at least due to difficulties reported in some studies in getting pregnant women to attend face-to-face sessions.

The only Intensity 1 trial with a positive result used non-midwifery advisors. The efficacy of interventions of Intensity 4 and Intensity 5 was similar regardless of the professional background of the person delivering the intervention. These results correspond with the results of a survey of UK services for pregnant smokers (Taylor and Hajek, 2001). Some services employed midwives to deliver specialist stop-smoking interventions while others employed advisors with different backgrounds. Advisor background had no effect on 4-week success rates.

The current practice within NHS is for pregnant smokers to receive multisession support and medication from stop smoking specialists employed by local stop smoking services. The key finding of this review supports this practice.

Interventions using incentives contingent on abstinence

There is evidence that progressive reinforcement schedules using financial incentives contingent on abstinence are effective. It is possible that the frequent visits for verification of abstinence and collection of rewards provide an extra level of support, which contributes to the intervention effect. It should be noted that the existing studies used carefully designed schedules where continuing abstinence was frequently checked and the rewards were progressive, with temporary lapses resetting the rewards to lower levels. This differs from some of the uncontrolled experiments conducted currently within the NHS. Implementing such interventions in routine care would be demanding. The staff would need to strictly adhere to schedules and frequent contacts from the above studies, and measures would need to be in place to try to limit a range of problems inherent in this approach.

Efficacy of pharmacotherapy

Nicotine replacement therapy in pregnancy is considered much safer than smoking (see Review 1) but only a few studies have evaluated its use in pregnancy and several of them were aborted due to concerns, which were in all cases shown unwarranted. As with other populations, NRT did not work when accompanied by minimal behaviour support. However, in this group, it did not show efficacy even when accompanied by more intensive support. Only a few studies with relatively small samples are available, the results go in the 'right' direction and it is possible that another large trial with the same trend would tip the pooled results over the significance line. It is also possible that NRT accompanied by home visits as provided by the UK services may be effective, but additional trials are needed to determine this (see Research Gaps below).

Interventions to prevent relapse

Interventions to prevent relapse in women who stopped smoking recently show no effect, regardless of their timing (during pregnancy, at delivery, or post-partum). This tallies with the general lack of efficacy of existing relapse prevention interventions.

Evidence Statements

ES: 2.1: There is strong evidence from trials that validated self-reported abstinence rates that low intensity (intensity 1-3) smoking cessation interventions in pregnancy (i.e. those that have minimal contact and follow-up for < 1 month following a target quit date) have no effect on abstinence rates in late pregnancy.

Only one study (Windsor et al 1985 [RCT +]) found an effect of a low intensity intervention (Intensity 1) whilst ten showed no effect (Hajek et al 2001 [RCT ++]; Hjalmarson et al 1991 [RCT +]; Kendrick et al 1995 [RCT +]; Lowe et al 1998 A [RCT +]; Lowe et al 1998 B [RCT +];

Moore et al 2002 [RCT +]; O'Connor et al 1992 [RCT +]; Secker-Walker et al; 1997 [RCT +]; Windsor et al 1985 [RCT +]; Windsor et al 1985 B [RCT +]). Pooling data from these studies showed no significant effect. Intensity 1 OR=1.01 (95%CI: 0.85-1.19); Intensity 3 OR=2.42 (95%CI: 0.82-7.12).

ES 2.2: There is moderate evidence from trials that validated self-reported abstinence rates that low intensity (intensity 1-3) smoking cessation interventions in pregnancy have no effect on abstinence rates post-partum.

Three studies (Hajek et al 2001 [RCT ++]; (O'Connor et al 1992 [RCT +]; Strecher et al 2000 [RCT -]) showed no effect and one (Hjalmarson et al 1991 [RCT +]) showed a modest benefit. Pooling data from these studies showed no significant effect. Intensity 1 OR=1.46 (95%CI: 0.98-2.17); Intensity 3 OR=2.65 (95%CI: 0.91-7.71).

ES 2.3: There is strong evidence from trials that validated self-reported abstinence rates that higher intensity (intensity 4-5) smoking cessation interventions in pregnancy (i.e. those that provide follow-up for > 1 month after a target quit date, either by telephone, written or electronic correspondence or face-to-face contact) increase abstinence rates in late pregnancy.

Six studies (Dornelas et al 2006 [RCT +]; Ershoff et al 1989 [RCT ++]; Walsh et al 1997 [RCT +]; Hartman et al 1996 [RCT +]; Hegaard et al 2003 [RCT+] Windsor et al 1993 [RCT+]) demonstrated efficacy of such interventions (Intensity 4-5), whilst 14 showed no effect (Albrecht et al 1998 [RCT -]; Cinciripini et al 2000 [RCT +]; Ershoff et al 1999 [RCT +]; Gielen et al 1997 [RCT +];; Lawrence et al [RCT +]; Loeb et al 1983 [RCT +]; Malchodi et al 2003 [RCT +]; Panjari et al 1999 [RCT +]; Patten et al 2010 [RCT +]; Rigotti et al 2006 [RCT +]; Solomon et al 2000 [RCT +]; Tappin et al 2000 [RCT +]; Tappin et al 2005 [RCT +]; Thornton et al 1997 [RCT +]). Pooling data from these studies showed a significant effect. Intensity 4 OR=1.72 (95%CI: 1.27-2.33); Intensity 5 OR=1.34 (95%CI: 1.11-1.63).

ES 2.4: There is strong evidence from trials that validated self-reported abstinence rates that high intensity (intensity 4-5) smoking cessation interventions in pregnancy do not increase abstinence rates post-partum.

One RCT (Walsh et al 1997 [RCT +]) showed that this type of intervention retained its beneficial effect on abstinence rates into the post-partum period, however this finding was not replicated by others (Bullock et al 2009 [RCT +]; Cinciripini et al 2000 [RCT +]; Dornelas et al 2006 [RCT +]; Lawrence et al [RCT +]; Rigotti et al 2006 [RCT +]; Stotts et al 2002 [RCT -]; Thornton et al 1997 [RCT +]). Pooling data from these studies showed no significant effect. Intensity 4 OR=1.27 (95%CI: 0.88-1.85); Intensity 5 OR=0.93 (95%CI: 0.62-1.38).

ES 2.5: There is no evidence that interventions delivered by midwives are more effective than interventions delivered by other providers such as counsellors and health advisors.

Only one Intensity 1 trial had a positive result and this trial used a non-midwifery intervention (Windsor et al 1985 [RCT +]). The efficacy of interventions of Intensity 4 (Bullock et al 2009 [RCT +]; Cinciripini et al 2000 [RCT +]; Dornelas et al 2006 [RCT +]; Ershoff

et al 1989 [RCT ++]; Patten et al 2010 [RCT +]; Rigotti et al 2006 [RCT +]; Stotts et al 2002 [RCT -]; Solomon et al 2000 [RCT +]; Walsh et al 1997 [RCT +]) and Intensity 5 (Gielen et al 1997 [RCT +]; Hartman et al 1996 [RCT +]; Loeb et al 1983 [RCT +]; Lowe et al 1997 [RCT +]; Malchodi et al 2003 [RCT +]; Pollak et al 2007 [RCT +]; Hegaard et al 2003 [RCT +]; Lawrence et al 2003 [RCT +]; Panjari et al 1999 [RCT +]; Tappin et al 2000 [RCT +]; Tappin et al 2005 [RCT +]; Thornton et al 1997 [RCT +]) were similar regardless of the professional background of the person delivering the intervention.

ES 2.6: There is strong evidence that the provision of financial incentives (vouchers redeemable for retail items for up to >$1,000) contingent on abstinence is effective in increasing cessation rates in late pregnancy, post-partum, and after the incentives are discontinued.

All four studies identified that examined this type of intervention demonstrated efficacy at time points up to delivery (Donatelle et al 2000 [RCT ++]; Heil et al 2008 [RCT ++]; Higgins et al 2004 [RCT +]; Higgins et al 2010 [RCT +])

Three studies demonstrated efficacy post-partum (Donatelle et al 2000 [RCT ++]; Higgins et al 2004 [RCT +]; Higgins et al 2010 [RCT +]), whilst one did not (Heil et al 2008 [RCT ++]). Pooled results show efficacy (OR=5.86; 2.74-12.52)

Two studies demonstrated efficacy post-discontinuation (Higgins et al 2004 [RCT +]; Higgins et al 2010 [RCT +]), whilst one did not (Heil et al 2008 [RCT ++]). Pooled results show efficacy (OR=10.29; 95%CI: 2.75-38.51).

ES 2.7: There is weak evidence that smoking cessation interventions targeting partners of pregnant women are ineffective.

One study (De Vries et al 2006, [RCT-) found no effect of such intervention with partners but did see a significant effect on women smokers. The three others (Lilley et al. 1986 [RCT -]; Lowe et al. 1998 [RCT +]; McBride et a. 2004 [RCT +]), which included a partner component had overall negative results as well in terms of women or partner smoking.

ES 2.8: There is weak evidence that low intensity interventions delivered to women post-partum are not effective and high intensity interventions are effective.

One study (Winickoff et al 2010 [RCT +]) showed no effect of Intensity 1 intervention. One study of Intensity 4 intervention (Hannover et al 2009 [RCT -]) showed no effect, whilst another of intensity 5 (Wall et al 1996 [RCT -]) demonstrated efficacy.

ES 2.9: There is strong evidence from trials that validated self-reported abstinence rates that nicotine replacement therapy, when used in standard doses, is ineffective in helping pregnant women quit smoking during pregnancy.

Of the six studies, four examined the use of patches (Coleman et al 2012, [RCT ++]; Hotham et al 2006 [RCT ++]; Kapur et al 2001, [RCT +]; Wisborg et al 2000, [RCT ++]), one of gum (Oncken et al 1998, [RCT +]) and one of a choice between patch, gum or lozenge (Pollak 2007

et al, [RCT ++]). None demonstrated a significant benefit over placebo across levels of support. Pooling interventions of different intensity provided negative results as well: Intensity 3 OR=1.27 (95%CI: 0.82-1.96); Intensity 4 OR=8.20 (95%CI: 0.40-169.90); Intensity 5 OR=1.48 (95%CI: 0.96-2.28).

ES 2.10: There is strong evidence from trials that validated self-reported abstinence rates that nicotine replacement therapy, when used in standard doses, has no effect on abstinence rates post-partum.

Three trials (Oncken et al 1998, [RCT +]; Pollack 2007 et al, [RCT ++]; Wisborg et al 2000, [RCT ++]) failed to demonstrate long-term efficacy of NRT. Pooling data from these studies showed no significant effect. Intensity 5 OR=1.08 (95%CI: 0.65-1.79).

ES 2.11: There is strong evidence from trials that validated self-reported abstinence rates that interventions aimed to prevent relapse in women who stopped smoking during pregnancy are ineffective regardless of their timing.

All 9 studies that focused on relapse prevention during and after pregnancy failed to show any beneficial effect (Ershoff et al 1995 [RCT +]; Hajek et al [RCT ++]; Johnson et al 2000 [RCT +]; Lowe et al 1997 [RCT +]; McBride et al 2004 [RCT +]; Morasco et al 2006 [RCT +]; Reitzel et al 2010 [RCT ++]; Secker-Walker et al 1995 [RCT +]; Secker-Walker et al 1998 [RCT ++]). Pooling these data confirm a lack of effect (OR=1.15; 95%CI: 0.94-1.43)

APPLICABILITY STATEMENT AND RESEARCH GAPS

The NHS practice currently involves referral of pregnant women who smoke to specialist smoking cessation treatment that typically consists of multi-session behavioural support for at least 4-weeks following a target quit date supplemented by the use of NRT and usually also by home visits. This is more intensive and sophisticated than any of the interventions evaluated so far. Women are referred by midwives and the intervention is provided by specialist pregnancy advisors employed for this purpose. The service is expensive because only a relatively small number of pregnant smokers attend treatment and the success rates are lower than in the mainstream service, but it is felt that if pregnant smokers were referred to mainstream service instead, the proportion of women taking up the referral would be even lower. In this sense, the current UK practice have overtaken research results

We identified four areas where more research is needed.

1. The reviewed evidence suggests that lower intensity interventions are effective and that NRT is not effective in this population. The UK advisors however provide a more intensive support than that examined in any of the studies reviewed. It is possible that NRT accompanied by this level of support is more effective than other options, but it is also possible that more economical interventions with a wider reach would provide the same or better results. Some of the minimal support studies reviewed above reported very high success rates (mostly studies with low quality rating), but overall the quit rates tended to be under 10%, and lower in studies which followed the women post-partum. A trial is needed comparing the current UK practice of intensive specialist support, home visits and

medication with an Intensity 3 or 4 intervention which could be delivered routinely by midwives.

2. There is good evidence that incentives contingent on abstinence facilitate smoking cessation. It should be noted though that the procedure shown effective required frequent visits, progressive reinforcement, and re-setting the rewards after lapses. The NHS is currently experimenting with incentives schemes, but these are typically provided in a much looser way and their efficacy is not formally evaluated. There are potential problems with the approach as discussed in Myers at al (2009), but it may hold a promise. A randomised evaluation of its implementation in routine care would help to assess its practicality, cost, and likely impact.

3. Regarding the lack of efficacy of relapse prevention interventions, in this area, an additional problem is that pregnant women who stopped smoking are unlikely to use medications or attend treatment sessions. Opportunistic encouragements and written materials which until recently were the only practicable options are known to lack efficacy. Currently however, electronic media provide a new alternative. A relapse prevention intervention based on text messaging has been shown practicable and it currently awaits a formal evaluation. If proven effective in general population (where such evaluation would be much easier to implement than in pregnant smokers), the next step would be to evaluate such approach formally with users of maternity services as well.

4. Regarding stop smoking medications, two approaches await evaluation. A. Pregnant women metabolise nicotine about twice as fast as non-pregnant smokers. It is possible that NRT dosing which follows the standard labelling leads to under-dosing in pregnancy and that higher dosing may achieve better results. B. Varenicline has been shown effective with several hard to reach groups. It has no known teratogenic effects. Given the lack of evidence that NRT helps in pregnancy and the high priority of smoking cessation in pregnancy, studies are needed to determine safety and efficacy of varenicline in this group.

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Appendices

APPENDIX 1: REVIEW PROTOCOL FOR REVIEWS 2 & 3

Overview of project

The National Institute for Health and Clinical Excellence (NICE) has been asked by the Department of Health to develop two separate pieces of complementary guidance on:

- 'Smoking cessation in secondary care: acute and maternity services'
- 'Smoking cessation in secondary care: mental health services'.

The guidance will address smokefree policies and smoking cessation and make recommendations on approaches to help secondary care commissioners, professionals and managers (including patients and service users and their family or carers, visitors and staff) in hospitals and other acute, maternity or mental healthcare settings (including emergency care, planned specialist medical care or surgery, and maternity care provided in hospitals, outpatient clinics, community outreach and rural units, as well as intensive services in psychiatric units and secure hospitals).

There are five components of work associated with the guidance development:

1. Smoking cessation in acute and obstetric services: one review of effectiveness and one review of barriers and facilitators (reviews 2 & 3).
2. Smoking cessation in mental health services: one review of effectiveness and one review of barriers and facilitators (reviews 4 & 5).
3. Smokefree strategies and interventions in secondary care settings: one review of effectiveness and one review of barriers and facilitators (reviews 6 & 7).
4. An economic analysis (cost effectiveness review and economic model)
5. Review of effects of nicotine in secondary care (review 1)

The CPHE has commissioned the National Centre for Smoking Cessation and Training (NCSCT) to deliver four of these components (1,2,3 and 5).

This review protocol sets out the process for Component One - Smoking cessation in acute and maternity services: one review of effectiveness (review 2) and one review of barriers and facilitators (review 3).

The aim of these reviews is to answer key questions as set out in the final scope document for the guidance on 'Smoking cessation in secondary care: acute and maternity services'.

The Review Team

This review will be led by Miss Katie Myers. She has led a NICE review of Relapse Prevention Interventions in Pregnancy[1] and was the lead author on the Pre-operative Smoking Cessation

systematic review[2]. Ms Myers has experience in searching literature for systematic reviews and project management. Professor Hajek will lead on the writing of the review. He has a long history of working with NICE and extensive experience in systematic reviews[1-6]. Dr McRobbie will assist the Project Team with literature screening and quality appraisal. He has led on a NICE systematic review (see McRobbie et al 2006[3]) and is an author of two Cochrane Systematic Reviews[7 8] and another recent systematic review[2]. Dr McRobbie was also a lead author of the literature review for the New Zealand Smoking Cessation Guidelines[9].

Mr Nigel Chee will provide expert project management support to the Project Team given the tight timeframes for this Component. He is an experienced manager with experience in managing large and complex health research, strategy, policy and implementation projects. He is also a co-author of the Clinical Guidelines for Weight Management in New Zealand Adults and the Clinical Guidelines for Weight Management in New Zealand Children[10]. He will primarily focus on driving the process for the project to ensure timelines are met and will also manage the relationships between the key stakeholders (including the Project Team, Independent Information Specialist, collaborators, NCSCTC CIC and NICE).

Independent Information Specialist

In addition to the skills and experience of the Project Team an independent information specialist (Ms Claire Stansfield) from the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) will provide advice on the search strategy and the approach to undertaking the literature search. Ms. Stansfield has extensive expertise in methods for identifying research for systematic reviews, is familiar with the syntax requirements of the databases used in NICE systematic reviews, and is a member of the Cochrane Collaboration's Information Retrieval Methods Group.

Collaborators

This review will also involve several other collaborators (listed below) who are leading components 2 and 3. The rationale for involving these wider collaborators is that we believe there are significant overlaps between the four components. Although each component "stands alone", we believe that working as a broader collective team will enable synergies across the work to be completed. The wider team is multi-disciplinary consisting of health and clinical psychologists, clinicians, research nurses, epidemiologists and medical statisticians and covers a wide range of specialist technical expertise including mental health care, secondary care and tobacco control research.

- Professor Ann McNeill (University of Nottingham);
- Dr Jo Leonardi-Bee (University of Nottingham);
- Dr Rachael Murray (University of Nottingham);
- Dr Elena Ratschen (University of Nottingham);
- Professor Sarah Lewis (University of Nottingham);
- Ms Kathryn Angus (University of Stirling); and
- Mr Douglas Eadie (University of Stirling).

The review process

This review will involve the following steps, which are described further within this protocol.

1) Searching and retrieval of relevant evidence/studies as outlined in the search protocol and strategy (see Appendix 1)
2) Selecting relevant evidence/studies using appropriate title/abstract screening checklists (see Appendix 2). Titles/abstracts will be screened independently by two reviewers.
3) Retrieval of full papers assessed to be potentially relevant following title/abstract screening.
4) Full papers will be screened independently by two reviewers and quality assessed using the NICE quality appraisal checklists (see Appendices 4-6).
5) Data will be extracted from each paper and entered into data extraction tables (see Appendices 7 & 8).
6) Data will be collated and presented in evidence tables, narrative summaries, summary tables, graphical presentation, and meta-analysis where appropriate. Sensitivity analyses related to inequality measures will be carried out, where possible.
7) Evidence statements and applicability statements will be formulated.

Project deliverables

Review 2

At the completion of this process the review team will:

1 Submit a **1st draft of the review** to the NICE Team by 16 March 2012
2 Undertake any amendments to the draft following NICE comments and provide a revised draft (**2nd draft**) by 9 April 2012
3 Present the review findings to the PDG meeting on 25 April 2012
4 Undertake any amendments to the reviews following comment from the PDG and summit a **3rd draft by** 8 May 2012
5 Provision of written contributions and technical support during and after the completion of the reviews, as required during the development of the public health programme guidance. This will include:
   - Supporting the NICE Team in responding to any stakeholder comments on the reviews during the consultation on the evidence and draft guidance (consultation is currently planned for April to July 2013).
   - Attendance at PDG meetings as required (dates for these meetings are outlined in Annex 2).
6 Submit the **final review** following public consultation, by 31 July 2013

Review 3

At the completion of this process the review team will:

7 Submit a **1st draft of the review** to the NICE Team by 4 May 2012
8 Undertake any amendments to the draft following NICE comments and provide a revised draft (**2nd draft**) by 28 May 2012
9 Present the review findings to the PDG meeting on 13 June 2012
10 Undertake any amendments to the reviews following comment from the PDG and summit a **3rd draft by** 25 June 2012

11 Provision of written contributions and technical support during and after the completion of the reviews, as required during the development of the public health programme guidance. This will include:
   - Supporting the NICE Team in responding to any stakeholder comments on the reviews during the consultation on the evidence and draft guidance (consultation is currently planned for April to July 2013).
   - Attendance at PDG meetings as required (dates for these meetings are outlined in Annex 2).
12 Submit the **final review** following public consultation, by 31 July 2013

Background

Hospitalisation provides a unique opportunity for people to stop smoking. Smokers who are admitted to hospital are often highly motivated to quit and the hospital setting provides a potentially supportive environment to do so. Hospitals are smokefree environments and admission brings people into direct contact with healthcare professionals who can advise on giving up smoking and offer evidence-based treatment.

Smoking cessation counselling delivered in an acute hospital setting, combined with follow-up support on discharge, seems to increase smoking cessation rates[11]. There are also data from systematic reviews to show that intensive smoking cessation interventions provided to pregnant women who smoke and delivered to people awaiting surgery can be effective in increasing long-term cessation rates.[1](Lumley et al., 2009; Moller & Villebro, 2009) However, this opportunity is often missed. Abstaining from smoking often results in a tobacco withdrawal syndrome (TWS) that comprises of a number of changes such as mood alterations, physical symptoms and signs, as well as biochemical and physiological changes.[1](Hughes, 2007) Not all smokers who are hospitalised will experience TWS but for those who do these symptoms can be managed. Current pharmacotherapies for smoking cessation, in particular fast acting nicotine replacement therapy (NRT) products, can be effective in alleviating tobacco withdrawal symptoms[1(West & Shiffman, 2001)] and could be offered to assist patients to abstain during their hospital stay.

There seems to be a number of barriers to providing help to smokers in secondary care. For instance there is a widespread concern that stopping smoking shortly before surgery may have negative effects on surgery outcomes, hospital electronic records are often inflexible and make recording of patient smoking status difficult, staff do not see addressing smoking as a part of their core duties,. There is a need to systematically review not just the efficacy of stop smoking interventions, which are usually evaluated in a somewhat rarified research setting but also the barriers and facilitators of stop smoking activities in acute and maternity settings. There is a scope to systematically increase referrals and access to smoking cessation services across both acute and maternity hospital settings, which such a review could facilitate.

Aim

The review aims to address the research questions set out below.

Scope

Groups that will be covered

The review will include evidence from smokers of all ages who use acute and maternity services, including those who are in the process of being referred to hospital and those who have recently been discharged. The review will all also capture:

- People who live in the same household as someone who is using acute and maternity services, such as partners, parents and other family members and carers
- visitors to acute and maternity care settings
- staff working in acute or maternity care settings, in particular, those who have direct contact with people using the services (this includes support staff, volunteers, those working for agencies or as locums and people employed by contractors)

This review will not consider the following populations:

- users of primary care services;
- users of mental health services; and
- staff working in, and visitors to, secondary care mental health settings.

Activities / interventions that will be covered

This review will address the effectiveness and barriers and facilitators of smoking cessation interventions in acute and maternity services. This will include:

- Interventions that help the populations of interest stop smoking
- Interventions that help populations of interest temporarily abstain

Activities / interventions that will not be covered

This review will not consider evidence relating to cut down to quit programmes in acute and maternity care settings. It will also not consider evidence relating to interventions aimed at staff to improve identification and referral of smokers.

These reviews will not consider evidence relating to smoking cessation and temporary abstinence interventions in users of primary care services, mental health services and staff working in, and visitors to, secondary care mental health services.

PICO table to summarise the review scope

Population
The review will include evidence from smokers of all ages who use acute and maternity services, including those who are in the process of being referred to hospital and those who have recently been discharged. The review will all also capture any literature on: • People who live in the same household as someone who is using acute and maternity services, such as partners, parents and other family members and carers • visitors to acute and maternity care settings • staff working in acute or maternity care settings, in particular, those who have direct

contact with people using the services (this includes support staff, volunteers, those working for agencies or as locums and people employed by contractors)

Intervention/Activity

This review will address the effectiveness and barriers and facilitators of smoking cessation interventions in acute and maternity services. This will include

- Interventions that help people stop smoking
- Interventions that help people temporarily abstain

Comparison

Data comparing pharmacological interventions with placebo or control procedures including no intervention, usual practice, or which compares two or more intervention types.

Data comparing behavioural interventions including face-to-face, self-help, telephone and internet interventions with control procedures

Data comparing other treatments (e.g. alternative medicine) with control procedures

The above comparisons will cover all studies concerning smoking cessation and temporary abstinence.

Data providing information on barriers and facilitators to smoking cessation in hospital and maternity service settings

Outcomes

Review 2

The following factors and outcomes will be considered in review 2:

- the effectiveness of smoking cessation interventions in acute and maternity service settings
- the effectiveness of temporary abstinence interventions in acute and maternity service settings

The key outcomes will include Russell Standard abstinence rates (continuous validated long-term abstinence rates based on ITT analysis). Where such strict outcomes are not available, other measures of outcome will be taken into account (e.g. point-prevalence short term un-validated abstinence rates). Other outcomes will include use and uptake of stop-smoking services and medications, and adverse events.

Review 3

The following factors and outcomes will be considered in review 3:

- How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation in terms of post-discharge care, sharing information on patients smoking status, advice and help

provided, treatment outcomes, and in using referral pathways to specialist treatment?
- What barriers and facilitators affect the delivery of effective interventions identified in review 2 from multiple perspectives?

Research questions

This review will attempt to answer the following six questions:

Question 1: How effective are smoking cessation interventions in helping people from the populations of interest?

Question 2: How effective are interventions for temporary abstinence in helping people from the populations of interest?

Question 3: How effective are the current approaches used by maternity care services to identify and refer smokers to stop-smoking services?

Question 4: How effective are the current approaches used by maternity care services to provide smokers with smoking cessation information, advice and support?

Question 5: How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation?

Question 6: What barriers and facilitators affect the delivery of effective interventions?

Literature search protocol

Aims

The aim of the literature search is to identify evidence on the effectiveness and barriers and facilitators of smoking cessation interventions in acute and maternity services in the population of interest (see section 4.1 for further details).

Search approach

Review 2

This review will use a systematic approach to identify literature of the highest quality available that provides information on:

a) the effectiveness of smoking cessation interventions in acute and maternity service settings

b) the effectiveness of temporary abstinence interventions in acute and maternity service settings

c) the effectiveness of current approaches used by maternity care services to identify and refer people to stop-smoking services, for example provided by public or private providers

d) the effectiveness of current approaches used by maternity care services to identify and provide smoking cessation information, advice and support, for example by a nurse or physician

e) the effective approaches to encourage maternity care professionals to record smoking status and refer to stop-smoking services

The review will also focus on literature that provides information on:

- how the effectiveness of interventions vary between different service users (including their family or people they live with), visitors and people that work in acute and maternity services and if they are more effective in combination
- deliverer, setting, timing, frequency duration and severity of dependence has on the impact and effectiveness of the intervention
- adverse events reported from smoking cessation and temporary abstinence interventions

Review 3

This review will use a systematic approach to identify literature that provides information on:

1. How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation, cessation in terms of sharing information on patient smoking status, advice and help provided, treatment outcomes, and in using referral pathways to specialist treatment?

2. What barriers and facilitators affect the delivery of effective interventions, for example the interventions identified in review 2?

The review will also focus on literature that provides information on:

- the views (knowledge, attitude, beliefs) of different population groups and service providers
- deliverer, setting, timing, frequency duration and severity of dependence has on the acceptability of the intervention
- adverse events reported from smoking cessation and temporary abstinence interventions

These reviews will not consider evidence relating to smoking cessation and temporary abstinence interventions in users of primary care services, mental health services and staff working in, and visitors to, secondary care mental health services. If a study concerns both primary and secondary care, evidence relevant to the search questions would be included.

Search questions

1: How effective are smoking cessation interventions in helping people from the populations of interest?

2: How effective are interventions for temporary abstinence in helping people from the populations of interest?

3: How effective are the current approaches used by maternity care services to identify and refer smokers to stop-smoking services?

4: How effective are the current approaches used by maternity care services to provide smokers with smoking cessation information, advice and support?

5: What are the barriers and facilitators to Joined up working / collaboration within or across settings, for example between primary and secondary care?

6: What barriers and facilitators affect the delivery of effective interventions?

Developing the search strategy

The main search strategy has been developed to capture the following:

(1) Review population and setting

The following search terms will be used

Patient admission/; hospitalization/; outpatients/ inpatients/; child, hospitalized/; adolescent, hospitalized/; Pregnant women/; patients/; patient#; (pregnant NS teens; teenager#; adolescent#; women; mothers); inpatient#, outpatient#; “out patients” inhospital; (day N2 patient#); ill patients; acutely ill; primip*; primigravid*; (patient# N2 surgery; operation; discharge#; readmission#; postdischarge#; emergency; emergencies; refer; refers; referral; referring; admit; admittance#; admitting; admission#; readmittance; readmitting; readmission#; postoperable; postoperative; admit; admits); maternity; maternal health; obstetrics; prenatal care; (“prenantal; antenatal; perinatal; obstetric; maternal AND service; services; clinic; clinics; health; healthcare”); hospitalised; hospitalized; secondary care; acute care; secondary health service; secondary health services; acute health service; acute health services; acute setting; acute settings; acute service; acute services; (acute; general; stay; staying W2 ward; wards); (accident; emergency; surgical; surgery; acute W unit; department); hospitals; hospital; (patient# N2 “post discharge”; maternal health services/; obstetric and gynecology department, hospital/; obstetrics/; hospitals+/; hospital units/; outpatient clinics, hospital/; emergency service, hospital; emergency medical services/; hospital staff/personnel/ W1 worker#; surgeon#; gyne#cologist#; obstetrician#; midwiv#; midwife; doctor#; nurse#; physician#; clinician#; pharmacist#; health W1 worker#; consultant#; medical W1 specialist#; medical W1 officer#

(2) Tobacco use

Tobacco use cessation/; Tobacco use disorder/; Tobacco, smokeless/; Smoking cessation/; Smoking/; Tobacco/; Tobacco; cigar*; "hand-roll"; handroll*; "hand-rolls"; "hand-rolled"; bidi; bidis; beedi; beedis; rolie; rolies; paan; gutkha; snuff; betel; cigar; cigars

(3) Smoking cessation

quit*; abstain*; abstinence; reduction; restrict*; reduce; cessation; (smoking; smoker#; tobacco; cigarette; cigarettes N2 quit; quitting; quitted; abstain; abstinence; reduction; reduces; reduce; abstaining); (tobacco; smoking; ADJ control); smoking services; smoking service; anti smoking; anti tobacco; temporary abstinence; (quit, abstain, abstinence, reduction, reduce, abstaining, ADJ2 tobacco, smoking, cigarette); (smoking, tobacco, cigarette#, smoker# N2 prevent; prevention; preventing; prevents; restrict#; restrict; restriction; restricted; restricts; restricting).

(4) Collaborative working

The following terms will be used to capture relevant literature on collaborative and joined up working in acute and maternity settings:

partnership# ; "team work" ; "teamwork"; teamworking; "team working"; cooperation; (cooperative W1 behavio#r); "integration"; "integrative approach"; "integrative approaches"; collaborat*; interagenc*; multiagenc*; "inter-institutional"; "inter-institutionally"; "inter-professional"; "inter-departmental"; "inter-departmentally"; interinstitutional*; interprofessional; interdepartmental*; "interprofessional relations"; "interprofessional relationships"; (multidisciplin*); "cross discipline"; "cross disciplinary"; (interagency); linkage#; "cross-discipline"; "cross-disciplinary".

Search strategy

The search strategy for Medline is shown in Appendix 1.

A systematic search of the grey literature will not be undertaken but hand searching of bibliographies of systematic reviews the meet the inclusion criteria will be carried out to ensure that relevant data are included in this review.

To supplement the search for evidence NICE may issue a call for evidence from registered stakeholders. Relevant evidence will be included in this review

Equality and Diversity

The search strategy will be inclusive and aims to capture a broad range of evidence across all ethnic and disadvantaged groups.

Electronic resources

Databases

The following list includes the electronic databases that will be searched

- AMED (Allied and Complementary Medicine)
- ASSIA (Applied Social Science Index and Abstracts)
- British Nursing Index
- CINAHL (Cumulative Index of Nursing and Allied Health Literature)
- Cochrane Central Register of Controlled Trials
- Cochrane Database of Systematic Reviews
- Database of Abstracts of Reviews of Effectiveness (DARE; 'other reviews' and Health Technology Assesment (HTA) database in CRD database)

- Current Contents
- EMBASE
- EPPI Centre TRoPHI
- HMIC (or King's Fund catalogue and DH data)
- Medline
- UK Clinical Research Network Portfolio Database
- PsycINFO
- Sociological Abstracts
- Social Policy and Practice
- Web of Knowledge (Science and Social Science Citation Indexes)
- CDC Smoking & Health Resource Library database
- Specialist (public health) systematic review registers
    - EPPI Centre DoPHER
    - Health Evidence ca

Websites

A minimum of 10 Internet sites will be searched from the following:

- Smoke free http://smokefree.nhs.uk
- NHS Centre for Smoking Cessation and Training http://www.ncsct.co.uk/,
- Action on Smoking and Health (ASH) http://www.ash.org.uk
- Treat tobacco.net http://www.treatobacco.net/en/index.php
- Society for Research on Nicotine and Tobacco http://www.srnt.org
- International Union against Cancer http://www.uicc.org
- WHO Tobacco Free Initiative (TIF) http://www.who.int/tobacco/en
- International Tobacco Control Policy Evaluation Project http://www.itcproject.org
- Tobacco Harm Reduction http://www.tobaccoharmreduction.org/index.htm
- Current controlled trials www.controlled-trials.com
- Association for the treatment of tobacco use and dependence (ATTUD) www.attud.org
- National Institute on drug abuse- the science of drug abuse and addiction http://www.nida.nih.gov/nidahome.html
- NICE
- Public health observatories
- Scottish Government
- Welsh Assembly Government
- NHS Evidence
- Joseph Rowntree Foundation
- The Centre for Tobacco Control Research (University of Stirling)
- UK Centre for Tobacco Control Studies
- Tobacco Control Research Group (University of Bath)
- http://www.controlled–trials.com

Restrictions

The following inclusion and exclusion criteria will be applied to the searches.

Inclusion Criteria

The following will be included:

Review 2:

- Systematic reviews
- Controlled studies published from 1990 to the most recent available at the time of the search

Review 3:

- All relevant experimental, observational and qualitative studies
- Descriptive reports

Exclusion Criteria

The following will be excluded:

- Animal studies
- Studies that do not primarily address the review questions; and
- Studies not published in English

Gathering the evidence.

The search strategy will be translated for use, and then run on each of the various databases and websites.

Documenting the search process

At the completing of searching each database the following steps will be undertaken:

1. Results from the database searches will be downloaded into 'Endnote'. Items which cannot be downloaded into bibliographic software will be recorded in a Word document
2. A word document containing the search strategies for each resource searched will be created. Each strategy will include audit information, as shown in appendix 2.
3. A final de-duplicated 'Reference manager database'.

Reference details for any studies which may be of relevance to the contractors who will be undertaking, component 2 (Mental Health reviews), component 3 (smokefree reviews) component 4 (Cost effectiveness review and economic analysis) or component 5 (nicotine review) will be recorded in EndNote and provided to the NICE Team to pass these files onto the relevant contractors.

Reviewing the evidence

Reviewing of the scientific evidence will involve the following five steps:

1) Select the relevant evidence.
2) Assess its quality.
3) Extract, synthesise and present it.
4) Derive evidence statements.
5) Assess its applicability.

Studies will be selected on the basis of relevance to the scope of this review and consideration will given to:

- Relevance to the PICO table described above
- The hierarchy of evidence
- Availability of evidence – if high quality evidence is not available then we will use the best available evidence.

Selecting the relevant evidence

Title/ abstract screening

All titles and abstracts obtained from the search will be independently screened by members of our Project Team; using a screening checklist (a sample screening checklist is outlined in Appendix 3). Where there is disagreement the full paper will be obtained and resolved by discussion. .

The following studies will be considered:

- Quantitative studies (both experimental and observational studies);
- Qualitative studies;
- Systematic reviews; and
- Information that addresses the review questions.

Full-paper screening

Full papers will be obtained for those abstracts that meet the criteria for inclusion and will be independently screened for inclusion by members of the project team. Any disagreement will be resolved via discussion. The composite inter-rater reliability scores will be reported and the selection process will be summarised in a flow diagram. Each study excluded at the full-paper screening stage will be listed in the appendix of the review, along with the reason for its exclusion.

Assessment of study quality

The internal and external validity of studies will be assessed using quality appraisal checklists provided in appendix 4.

Each paper will be graded using the rating scale summarised below. Quality of this process will be assessed by appraising 10% of papers by a second appraiser to check accuracy. Any disagreement will be resolved by a third appraiser. The composite inter-rater reliability scores will be reported. This approach was utilised in previous NICE systematic reviews completed by members of this review team.(McRobbie, Hajek, Bullen, & Feigen, 2006; Myers, West, & Hajek, 2009)

Internal validity

The review team will use the checklists to ascertain if potential sources of bias have been minimised and to determine if its conclusions are open to any degree of doubt. Each study should be rated ('++', '+' or '-') to indicate its quality, where:

- ++ All or most of the checklist criteria have been fulfilled; where they have not been fulfilled the conclusions are very unlikely to alter.
- + Some of the checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter.
- – Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

The reasons for the quality rating will be documented in the appraisal checklist.

External validity

The external validity of studies will be assessed by determining the extent to which the findings for the study population are generalisable to the whole 'source population'. A rating of EV++, EV+, or EV- will be applied to indicate the degree of quality.

Data extraction and synthesis

Data extraction

A narrative summary and evidence table will be completed for each selected study. Data will be extracted into the evidence tables and will document data regarding the: population; intervention (e.g. use of nicotine replacement products); and outcomes. The template that will be used for the evidence table is shown in Appendix 6, and is based on the recommendations of the NICE CPHE Methods Manual.[16] For quantitative studies exact p-values (whether or not significant) and confidence Intervals, where available, will be reported. Separate evidence tables will be produced to summarise the evidence related to each review question.

For qualitative data, analysis of the themes will be presented in the evidence tables along with a brief narrative of the paper – See Appendix 7.

Data synthesis

Findings from the review will be grouped into sections that will answer each review question. Subsections will be created to summarise data related to particular sub-topics. Evidence statements will be provided for each subsection.

Where data allows, meta-analyses will be undertaken.

Qualitative data will be themed and summarised. The main topics are likely to concern setting up systems for identification and referral of pregnant smokers, setting up systems for

treatment in both pregnancy and secondary care, and issues concerning follow-up/post discharge care.

Meta-analyses

Meta-analyses will be conducted using RevMan software. A fixed effect model will be used, except in situations where there is statistical heterogeneity where a random effects model will be used. Forest plots will be presented for all meta-analyses.

Narrative summaries

The key findings of evidence will be summarised in concise narrative summaries that relate to particular sub-topics.

Evidence statments

The proposed evidence statements to be used in this evidence review will follow NICE recommendations. Statements will contain a descriptor, strength, and direction (positive or negative) of the evidence. Quality ratings of studies will be used to formulate the strength. The overall strength will be summarised using the following:

- No evidence
- Weak evidence
- Moderate evidence
- Strong evidence

Evidence statements will also be developed from qualitative data. These will summarise the quality, context and key findings, and state the degree of concurrence between studies.

Applicability statements

The degree of applicability of the evidence, summarised in each evidence statement in this review, to the UK setting will be assessed. For each study included the reviewers will assess characteristics of the population, setting, intervention and outcomes studied. An applicability statement, showing the applicability of the evidence to the UK setting will be formulated and presented after each evidence statement using the following terms:

- directly applicable
- partially applicable
- not applicable.

Issues related to Inequalities

Any issues related to inequalities that appear in the literature will be flagged and summarised in a separate section of the final report.

References

Hughes, J. R. (2007). Effects of abstinence from tobacco: valid symptoms and time course. *Nicotine Tob Res, 9*(3), 315-327.

Lumley, J., Chamberlain, C., Dowswell, T., Oliver, S., Oakley, L., & Watson, L. (2009). Interventions for promoting smoking cessation during pregnancy. *Cochrane Database Syst Rev*(3), CD001055.

McRobbie, H., Hajek, P., Bullen, C., & Feigen, V. (2006). Rapid review of non-NHS treatments for smoking cessation Retrieved 6 Oct 2011 http://www.nice.org.uk/nicemedia/pdf/SmokingCessationNon-NHSFullReview.pdf

Moller, A., & Villebro, N. (2009). Interventions for preoperative smoking cessation. *Cochrane Database Syst Rev*(3).

Myers, K., West, O., & Hajek, P. (2009). A rapid review of interventions to prevent relapse in pregnant ex-smokers: A report to the National Institute for Health and Clinical Excellence. London.

Pollak, I., & Mullen, P. D. (1997). An exploration of the effects of partner smoking, type of social support, and stress on postpartum smoking in married women who stopped smoking during pregnancy. *Psychology of Addictive Behaviors, 11*(3), 182-189.

Walsh, R., & Redman, S. (1993). Smoking cessation in pregnancy: Do effective programmes exist? *Health Promotion International, 8*(2), 111-127.

West, R., & Shiffman, S. (2001). Effect of oral nicotine dosing forms on cigarette withdrawal symptoms and craving: a systematic review. *Psychopharmacology (Berl), 155*(2), 115-122.

Search strategy for Medline

Smoking cessation in acute and maternity services: one review of effectiveness and one review of barriers and facilitators

Platform: EBSCO

Search conducted by C. Stansfield on 4 January 2011

Results: 6634

#	Query	Results
S1	MH ("TOBACCO USE CESSATION+")	18854
S2	(MH "Smoking Cessation")	16197
S3	(MH "Smoking/PC")	13139
S4	TI ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)	1331
S5	AB ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)	2629
S6	TI (quit* OR abstain* OR abstinence OR reduction OR restrict* OR reduce OR cessation)	119903
S7	AB (quit* OR abstain* OR abstinence OR reduction OR restrict* OR reduce OR cessation)	1167034
S8	TI ((stop N2 smoking) OR (stopping N2 smoking) OR (stopped N2 smoking) OR (stoppage N2 smoking))	526
S9	TI ((stop N2 cigarette) OR (stopping N2 cigarette) OR (stopped N2 cigarette) OR (stoppage N2 cigarette))	6
S10	AB ((stop N2 cigarette) OR (stopping N2 cigarette) OR (stopped N2 cigarette) OR (stoppage N2 cigarette))	63
S11	TI ((stop N2 cigarettes) OR (stopping N2 cigarettes) OR (stopped N2 cigarettes) OR (stoppage N2 cigarettes))	4
S12	AB ((stop N2 cigarettes) OR (stopping N2 cigarettes) OR (stopped N2 cigarettes) OR (stoppage N2 cigarettes))	39
S13	AB ((stop N2 tobacco) OR (stopping N2 tobacco) OR (stopped N2 tobacco) OR (stoppage N2 tobacco))	106
S14	TI ((stop N2 tobacco) OR (stopping N2 tobacco) OR (stopped N2 tobacco) OR (stoppage N2 tobacco))	28
S15	TI ((smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))	531
S16	AB ((smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking)	1348

	OR (anti N1 tobacco))	
S17	AB ((smoking N2 prevent) OR (smoking N2 prevention) OR (smoking N2 preventing) OR (smoking N2 prevents) OR (tobacco N2 prevent) OR (tobacco N2 prevention) OR (tobacco N2 preventing) OR (tobacco N2 prevents) OR (cigarette# N2 prevent) OR (cigarette# N2 prevention) OR (cigarette# N2 preventing) OR (cigarette# N2 prevents) OR (smoker# N2 restrict#) OR (smoker# N2 restriction) OR (smoker# N2 restricted) OR (cigarette# N2 restrict) OR (cigarette# N2 restricted) OR (cigarette# N2 restricts) OR (cigarette# N2 restricting) OR (cigarette# N2 restriction) OR (tobacco N2 restrict) OR (tobacco N2 restricted) OR (tobacco N2 restricts) OR (tobacco N2 restricting) OR (tobacco N2 restriction) OR (smoking N2 restrict) OR (smoking N2 restricted) OR (smoking N2 restricts) OR (smoking N2 restricting) OR (smoking N2 restriction)) OR TI ((smoking N2 prevent) OR (smoking N2 prevention) OR (smoking N2 preventing) OR (smoking N2 prevents) OR (tobacco N2 prevent) OR (tobacco N2 prevention) OR (tobacco N2 preventing) OR (tobacco N2 prevents) OR (cigarette# N2 prevent) OR (cigarette# N2 prevention) OR (cigarette# N2 preventing) OR (cigarette# N2 prevents) OR (smoker# N2 restrict#) OR (smoker# N2 restriction) OR (smoker# N2 restricted) OR (cigarette# N2 restrict) OR (cigarette# N2 restricted) OR (cigarette# N2 restricts) OR (cigarette# N2 restricting) OR (cigarette# N2 restriction) OR (tobacco N2 restrict) OR (tobacco N2 restricted) OR (tobacco N2 restricts) OR (tobacco N2 restricting) OR (tobacco N2 restriction) OR (smoking N2 restrict) OR (smoking N2 restricted) OR (smoking N2 restricts) OR (smoking N2 restricting) OR (smoking N2 restriction))	3480
S18	AB (temporary abstinence) OR TI (temporary abstinence)	34
S19	TI ((tobacco N2 quit) OR (tobacco N2 quitting) OR (tobacco N2 quitted) OR (tobacco N2 abstain) OR (tobacco N2 abstinence) OR (tobacco N2 reduction) OR (tobacco N2 reduces) OR (tobacco N2 reduce) OR (tobacco N2 abstaining))	269
S20	AB ((tobacco N2 quit) OR (tobacco N2 quitting) OR (tobacco N2 quitted) OR (tobacco N2 abstain) OR (tobacco N2 abstinence) OR (tobacco N2 reduction) OR (tobacco N2 reduces) OR (tobacco N2 reduce) OR (tobacco N2 abstaining))	1157
S21	TI ((smoking N2 quit) OR (smoking N2 quitting) OR (smoking N2 quitted) OR (smoking N2 abstain) OR (smoking N2 abstinence) OR (smoking N2 reduction) OR (smoking N2 reduces) OR (smoking N2 reduce) OR (smoking N2 abstaining))	1154
S22	AB ((smoking N2 quit) OR (smoking N2 quitting) OR (smoking N2 quitted) OR (smoking N2 abstain) OR (smoking N2 abstinence) OR (smoking N2 reduction) OR (smoking N2 reduces) OR (smoking N2 reduce) OR (smoking N2 abstaining))	6788
S23	TI ((cigarette N2 quit) OR (cigarette N2 quitting) OR (cigarette N2 quitted) OR (cigarette N2 abstain) OR (cigarette N2 abstinence) OR (cigarette N2 reduction) OR (cigarette N2 reduces) OR (cigarette N2 reduce) OR (cigarette N2 abstaining))	154
S24	AB ((cigarette N2 quit) OR (cigarette N2 quitting) OR (cigarette N2 quitted) OR (cigarette N2 abstain) OR (cigarette N2 abstinence) OR (cigarette N2 reduction) OR (cigarette N2 reduces) OR (cigarette N2 reduce) OR (cigarette N2 abstaining))	586

S25	TI ((cigarettes N2 quit) OR (cigarettes N2 quitting) OR (cigarettes N2 quitted) OR (cigarettes N2 abstain) OR (cigarettes N2 abstinence) OR (cigarettes N2 reduction) OR (cigarettes N2 reduces) OR (cigarettes N2 reduce) OR (cigarettes N2 abstaining))	30
S26	AB ((cigarettes N2 quit) OR (cigarettes N2 quitting) OR (cigarettes N2 quitted) OR (cigarettes N2 abstain) OR (cigarettes N2 abstinence) OR (cigarettes N2 reduction) OR (cigarettes N2 reduces) OR (cigarettes N2 reduce) OR (cigarettes N2 abstaining))	282
S27	TI ((smoking N2 cessation) OR (tobacco N2 cessation) OR (cigarettes N2 cessation) OR (cigarette N2 cessation))	6240
S28	AB ((smoking N2 cessation) OR (tobacco N2 cessation) OR (cigarettes N2 cessation) OR (cigarette N2 cessation))	12419
S29	TI ((smoker# N2 quit) OR (smoker# N2 quitting) OR (smoker# N2 quitted) OR (smoker# N2 abstain) OR (smoker# N2 abstaining) OR (smoker# N2 abstinence) OR (smoker# N2 reduction) OR (smoker# N2 reduce#) OR (smoker# N2 abstaining))	231
S30	AB ((smoker# N2 quit) OR (smoker# N2 quitting) OR (smoker# N2 quitted) OR (smoker# N2 abstain) OR (smoker# N2 abstaining) OR (smoker# N2 abstinence) OR (smoker# N2 reduction) OR (smoker# N2 reduce#) OR (smoker# N2 abstaining))	2118
S31	(S4 OR S5) AND (S6 OR S7)	530
S32	S1 or S2 or S3 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19 or S20 or S21 or S22 or S23 or S24 or S25 or S26 or S27 or S28 or S29 or S30 or S31	36889
S33	(MH "Patient Admission")	16145
S34	(MH "Hospitalization+")	133618
S35	(MH "Outpatients")	6928
S36	(MH "Inpatients")	10026
S37	(MH "Child, Hospitalized")	5455
S38	(MH "Adolescent, Hospitalized")	376
S39	(MH "Pregnant Women")	4529
S40	(MH "Patients")	14318
S41	TI (patient#)	1076780
S42	TI ((pregnant N3 teens) OR (pregnant N3 teenage#) OR (pregnant N3 teenager#) OR (pregnant N3 adolescent#) OR (pregnant N3 women) OR (pregnant N3 mothers))	13792
S43	AB ((pregnant N3 teens) OR (pregnant N3 teenage#) OR (pregnant N3 teenager#) OR (pregnant N3 adolescent#) OR (pregnant N3 women) OR (pregnant N3 mothers))	45618
S44	TI (inpatient# OR outpatient# OR "out patient" OR "out patients" OR "inhospital" OR (day N2 patient#) OR "ill patients" OR "acutely ill" OR primip* OR primigravid*)	40738
S45	AB (inpatient# OR outpatient# OR "out patient" OR "out patients" OR "inhospital" OR (day N2 patient#) OR "ill patients" OR "acutely ill" OR primip* OR primigravid*)	169326

S46	TI ((patient# N2 surgery) OR (patient# N2 operation) OR (patient# N2 discharge#) OR (patient# N2 readmission#) OR (patient# N2 postdischarge#) OR (patient# N2 emergency) OR (patient# N2 emergencies))	14963
S47	AB ((patient# N2 surgery) OR (patient# N2 operation) OR (patient# N2 discharge#) OR (patient# N2 readmission#) OR (patient# N2 postdischarge#) OR (patient# N2 emergency) OR (patient# N2 emergencies))	119288
S48	TI ((patient# N2 referral#) OR (patient# N2 referring) OR (patient# N2 admittance#) OR (patient# N2 admitting) OR (patient# N2 admission#) OR (patient# N2 readmittance) OR (patient# N2 readmitting) OR (patient# N2 readmission#) OR (patient# N2 postoperable) OR (patient# N2 postoperative) OR (patient# N2 refer) OR (patient# N2 refers) OR (patient# N2 admit) OR (patient# N2 admits))	4715
S49	AB ((patient# N2 referral#) OR (patient# N2 referring) OR (patient# N2 admittance#) OR (patient# N2 admitting) OR (patient# N2 admission#) OR (patient# N2 readmittance) OR (patient# N2 readmitting) OR (patient# N2 readmission#) OR (patient# N2 postoperable) OR (patient# N2 postoperative) OR (patient# N2 refer) OR (patient# N2 refers) OR (patient# N2 admit) OR (patient# N2 admits))	46690
S50	TI (maternity OR "maternal health" OR obstetrics OR "prenatal care" OR "prenatal services" OR "antenatal care" OR "antenatal services" OR "obstetric care" OR "obstetric services" OR "perinatal care" OR "prenatal clinic" OR "prenatal clinics" OR "prenatal health" OR "prenatal service" OR "antenatal clinic" OR "antenatal clinics" OR "antenatal service" OR "antenatal health" OR "obstetric clinic" OR "obstetric clinics" OR "obstetric service" OR "obstetric health" OR "perinatal clinic" OR "perinatal clinics" OR "perinatal service" OR "perinatal services" OR "perinatal health" OR pregnancy OR "maternity healthcare" OR "obstetric healthcare" OR "prenatal healthcare" OR "antenatal healthcare" OR "perinatal healthcare" OR "maternal care" OR "maternal service" OR "maternal services" OR hospitalised OR hospitalized OR "secondary care" OR "acute care" OR "secondary health service" OR "secondary health services" OR "acute health service" OR "acute health services" OR "acute setting" OR "acute settings" OR "acute service" OR "acute services")	157954
S51	AB (maternity OR "maternal health" OR obstetrics OR "prenatal care" OR "prenatal services" OR "antenatal care" OR "antenatal services" OR "obstetric care" OR "obstetric services" OR "perinatal care" OR "prenatal clinic" OR "prenatal clinics" OR "prenatal health" OR "prenatal service" OR "antenatal clinic" OR "antenatal clinics" OR "antenatal service" OR "antenatel health" OR "obstetric clinic" OR "obstetric clinics" OR "obstetric service" OR "obstetric health" OR "perinatal clinic" OR "perinatal clinics" OR "perinatal service" OR "perinatal services" OR "perinatal health" OR pregnancy OR "maternity healthcare" OR "obstetric healthcare" OR "prenatal healthcare" OR "antenatal healthcare" OR "perinatal healthcare" OR "maternal care" OR "maternal service" OR "maternal services" OR hospitalised OR hospitalized OR "secondary care" OR "acute care" OR "secondary health service" OR "secondary health services" OR "acute health service" OR "acute health services" OR "acute setting" OR "acute settings" OR "acute service" OR "acute services")	255290
S52	TI ((acute W2 ward) OR (acute W2 wards) OR (general W2 ward) OR (general W2 wards) OR (stay W2 ward) OR (staying W2 ward) OR (stay W2 wards) OR (staying W2 wards))	677

S53	AB ((acute W2 ward) OR (acute W2 wards) OR (general W2 ward) OR (general W2 wards) OR (stay W2 ward) OR (staying W2 ward) OR (stay W2 wards) OR (staying W2 wards))	2962
S54	TI ((accident W3 unit) OR (accident W3 department) OR (emergency W1 unit) OR (emergency W1 department) OR (surgical W1 ward) OR (patient# N2 surgery) OR (surgery W2 unit) OR (surgery W2 department) OR (acute W2 unit) OR (acute W2 department))	23092
S55	AB ((accident W3 unit) OR (accident W3 department) OR (emergency W1 unit) OR (emergency W1 department) OR (patient# N2 surgery) OR (surgical W1 ward#) OR (surgery W2 unit) OR (surgery W2 department) OR (acute W2 unit) OR (acute W2 department))	108278
S56	TI (hospitals OR hospital OR (patient# N2 "post discharge"))	181415
S57	AB (hospitals OR hospital OR (patient# N2 "post discharge"))	493665
S58	(MH "Maternal Health Services+")	28351
S59	(MH "Obstetrics and Gynecology Department, Hospital")	2214
S60	(MH "Obstetrics")	14150
S61	(MH "Hospitals+")	180568
S62	(MH "Hospital Units+")	66597
S63	(MH "Outpatient Clinics, Hospital+")	14543
S64	(MH "Emergency Service, Hospital+")	40071
S65	(MH "Emergency Medical Services")	27584
S66	TI (("hospital staff") OR ("hospital personnel") OR (hospital W1 worker#) OR surgeon# OR gyne#cologist# OR obstetrician# OR midwiv* OR midwife)	25287
S67	AB (("hospital staff") OR ("hospital personnel") OR (hospital W1 worker#) OR surgeon# OR gyne#cologist# OR obstetrician# OR midwiv* OR midwife)	103541
S68	TI (hospital) OR AB (hospital)	533136
S69	TI (doctor# OR nurse# OR physician# OR clinician# OR pharmacist# OR health W1 worker# OR consultant# OR (medical W1 specialist#) OR (medical W1 officer#))	191646
S70	AB (doctor# OR nurse# OR physician# OR clinician# OR pharmacist# OR health W1 worker# OR consultant# OR (medical W1 specialist#) OR (medical W1 officer#))	412247
S71	S69 or S70	543647
S72	(S68 and S71)	67181
S73	AB (partnership# or "team work" or "teamwork" OR teamworking OR "team working" or cooperation or (cooperative W1 behavio#r) or "integration" or "integrative approach" OR "integrative approaches" or collaborat* or interagenc* or multiagenc* or "inter-institutional" or "inter-institutionally" or "inter-professional" or "inter-departmental" or "inter-departmentally" or interinstitutional* or interprofessional or interdepartmental* or "interprofessional relations" or "interprofessional relationships" or (multidisciplin*) or "cross discipline" OR "cross disciplinary" or (interagency) OR linkage# OR "cross-discipline" OR "cross-disciplinary")	261508
S74	TI (partnership# or "team work" or "teamwork" OR teamworking OR "team	71666

	working" or cooperation or (cooperative W1 behavio#r) or "integration" or "integrative approach" OR "integrative approaches" or collaborat* or interagenc* or multiagenc* or "inter-institutional" or "inter-institutionally" or "inter-professional" or "inter-departmental" or "inter-departmentally" or interinstitutional* or interprofessional or interdepartmental* or "interprofessional relations" or "interprofessional relationships" or (multidisciplin*) or "cross discipline" OR "cross disciplinary" or (interagency) OR linkage# OR "cross-discipline" OR "cross-disciplinary")	
S75	(S33 or S34 or S35 or S36 or S37 or S38 or S39 or S40 or S41 or S42 or S43 or S44 or S45 or S46 or S47 OR S48 OR S49 OR S50 OR S51 OR S52 OR S53 or S54 or S55 or S56 or S57 or S58 or S59 or S60 or S61 or S62 or S63 or S64 or S65 or S66 or S67 or S68 or S72 or S73 or S74)	2614599
S76	S75 AND S32	7304
S77	MH ("Humans") AND MH ("Animals")	1253188
S78	MH ("Animals")	4777882
S79	S78 NOT S77	3524694
S80	S76 NOT S79	6634

Notes:

= wildcard of 1 or 0 characters

* = truncation

N2 = words within 2 places of each other in any order

W2 = words within 2 places of each other in the order written in the text

Appendix 2: Audit information that will accompany each database and website search

Database name	
Search date	
Database host *(name of host or environment in which the database was searched)*	
Coverage dates	
Name of searcher	
Search strategy checked by	
Number of records retrieved	
Name of EndNote library	
Number of records loaded into EndNote library	
Reference numbers of records in EndNote library *(range of unique reference numbers assigned to the records by EndNote)*	
Number of records after deduplication in EndNote library	

Appendix 3: Title/Abstract Screening Checklist

Review 2

1	Does the paper report a controlled trial of a smoking cessation intervention in acute and maternity services, or a controlled trial of interventions to encourage staff to identify pregnant smokers and provide advice or referral?	Yes – get full text	No – exclude

Where the assessor is unsure about a paper then the abstract will be discussed among all reviewers and a final decision made.

Review 3

1	Does the paper report on smoking cessation in acute and maternity services?	Yes – go to next question	No – exclude
2	Does the paper provide information on barriers, facilitators or joined-up working?	Yes – get full text	No – exclude

Where the assessor is unsure about a paper then the abstract will be discussed among all reviewers and a final decision made.

Appendix 4: Quality appraisal checklist for quantitative studies

Study identification:		
Study design:		
Assessed by:		
Section 1: Population		
• Representative sample? (selection biases e.g. low proportion agreed to participate, highly selected subgroups)	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	Comments:
Section 2: Methods		
Randomisation • Individual/cluster corrected for/unclear? • Could the researcher influence the allocation?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
Intervention delivery • Intervention delivered to most patients in the intervention arm? • Contamination between study arms?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
Generalizability to UK • Setting and intervention relevant for UK practice?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
Section 3: Outcomes		
• Abstinence validated and validation results taken into account in outcome calculations? • Reports continuous abstinence or only point prevalence abstinence? • Participants lost to follow-up included as smoking?	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
• Length of follow-up: under 1M=-, 1-5M=+, 6M or more=++	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	
	☐	
Overall assessment **++=good sample and design, Russell Standard outcomes**	☐ ++ ☐ + ☐ - ☐ NR ☐ NA	

Appendix 5: Review screening form

Study identification	
Checklist completed by**:**	
In a well-conducted systematic review:	
Is the literature search sufficiently rigorous to identify all the relevant studies?	Yes No Unclear
Overall Quality	Comments

Appendix 6: Data extraction form/Evidence Table for Quantitative studies

Study details	Population	Intervention	Outcomes	Results	Notes
Authors	Study population	Method of allocation	ITT?	Abstinence rates	Limitations
Year		Intervention	Validated?		
Citation			Continuous or PP?		
		Control/comparison			
Study design		Sample size	Follow-up periods		
Quality score		Baseline differences not controlled for?			
External validity					

Appendix 7: Data extraction form/Evidence Table for Qualitative papers

Study details	Population		Notes
Authors			
Year			
Citation		Key themes relevant to this review:	

APPENDIX 2 – PAPERS UNAVAILABLE FOR THE HOSPITAL SECTION (N=19)

(1994) "Nicotine replacement therapy for patients with coronary artery disease. Working Group for the Study of Transdermal Nicotine in Patients with Coronary artery disease."
(2010) "How one facility helps patients stop smoking."
(2011) "How one facility helps patients stop smoking."
Anders (2011)
Bock (2008)
Eisenberg (2011)
Glavas (2003)
Grandi (2011)
Kapur (2004)
Meysman (2010)
Murphy (1994)
Nett (1992)
Rigotti (1996)
Spencer (2004)
Strayer (2004)
Todd (1998)
Weissfeld (1991)
Wewers (1992)
Wewers (1993)

APPENDIX 3 – PAPERS EXCLUDED FROM THE HOSPITAL SECTION (N=41)

(2007). "Inpatient smoking-cessation programs get the job done."	Article not relevant
(2008). "Treating patients who use tobacco."	Article not relevant
(2009). "Stop smoking hospitals pilots."	Newspaper article
(2010). "Thoracic surgeons can help patients stop smoking with a brief smoking cessation program."	Link to another paper - Kozower 2010
(2011). "Motivate patients to stop smoking."	Not RCT
Allen (1998)	Excluded by Rigotti
An (2008)	Not RCT
Bernstein (2011)	Only 3 month FU
Canga (2000)	Not included as not in right setting
Carson (2010)	Conference paper preliminary data only
Choo (2004)	Only 1 month FU data available
Dalton (1991)	Psychiatric setting
Fonteyn (2004)	Commentary on Quist-Paulsen 2003, exclude
Gies (2008)	Not RCT
Gritz (1991)	Describes trial and SS but no results
Hanssen (2007)	2008 paper includes longest time FU - 18 months
Holmes-Rovner(2008)	Cannot extract data
Jha (2005)	Review of Taylor
Joseph (1996)	Study methods - get full paper
Lacasse (2005)	Conference report on Lacasse 2007 study
Lisspers (1999)	Cannot extract data
Moller (2003)	Different question but related to Moller 2002
Mackay (2010)	Poster - not RCT
Maud-Christine (2005)	Chouinard paper - already included in Rigotti
Mohjuddin (2006)	Summary of Mohiuddin (2007)

Murray (2002)	Commentary on 2002 paper
Park (2011)	Non-randomised
Peterson (2004)	Not relevant setting
Reid (2011)	Conference report
Richman (2000)	3 month FU only
Stainislaw (1994)	Only 5 week FU
Tan (2011)	Not RCT
1994) "Nicotine replacement therapy for patients with coronary artery disease. Working Group for the Study of Transdermal Nicotine in Patients with Coronary artery disease."	Not acute services setting
Thorndike (2008)	Secondary analysis of Rigotti paper
Uzuner (2008)	Review 3
van Elderen-van Kemenade (1994)	No detail on number of baseline smokers
Vander Weg (2008)	Not relevant setting
Volpp (2006)	Not relevant setting
Wolfenden (2005)	No data - include in review 3
Wolfenden (2008)	Less than 12 month follow up, results not clear
Wong (2005)	No data/focus on smoking cessation

APPENDIX 4 – PAPERS UNABLE TO GET FOR THE MATERNITY SECTION (N=17)

Alves (2011)
Chan (2008)
Health Technology (2006) Double-blind, randomised, placebo-controlled trial of nicotine replacement therapy (NRT) in pregnancy
Mullen (1999)
Smith (2006)
Stenchever (2003)
Valbo (1994)
Valbo (1996)
Windsor (2011)
Wisborg (1997)
King (1992)
Olds et al 1986
Price et al 1991
Rush et al 1992
Langford et al 1983
Gilles et al 1990
Messimer et al 1989

APPENDIX 5 – PAPERS EXCLUDED FROM THE MATERNITY SECTION (N=35)

(1997). "Smoking cessation program focuses on pregnant women."	Summary of McBride
Albrecht (2006)	Excluded from Lumley
Atkinson et al. (2003)	Abstract with no details
Bauman (1983)	Included in Lumley but data extraction could not be done
Byrd (1993)	No Ns for between groups
Campbell (2006)	Included in Lumley but not a trial of stop smoking interventions. Ns also difficult to extract
Chen-Louie (1993)	Commentary
Donovan (1996)	Commentary
Groner et al. (2000)	Focus on mothers (older children) and ETS
Health Technology (2010) A pragmatic randomized controlled trial of physical activity as an aid to smoking cessation during pregnancy	Project HTA grant
Hennrikus (2010)	No data on baseline or postpartum smoking rates
Hughes (2000)	Excluded from Lumley
Jehn (2003)	Not RCT
Lillington (1995)	Excluded from Lumley
Lowe (2002)	Excluded from Lumley
Röske (2009)	Equation modelling for Hannover - no data
Ruggiero (1997)	Not RCT

Sheahan (1997)	No data - use in review 3
Stanton (2004)	Excluded from Lumley
Yilmaz (2006)	Excluded from Lumley
Donovan (1996)	No cessation data
Haddow (1991)	No cessation data
Shakespeare (1990)	No cessation data
Lillington (1995)	Not RCT
Gebour (1998)	Not RCT
Windsor 2000	Brief report
Valanis et al 2001	Not RCT
Weerd et al 2001	letter commenting on Pollack et al 2001. Weerd et al cite a cohort study that they had completed. Since it was not a RCT it cannot be included.
Pollak et al 2001	letter commenting on Pollak (Pollak & Mullen, 1997) et al 2001.
Gulmezoglu et al 1997	Use systematic reviews to extract data
Ershoff et al 1990	This can be excluded as it reports only the economic evaluation of the 1989 trial.
El-Mohandes et al 2011	Unable to extract data
Gadomski et al 2011	Quasi randomised
Kendzor 2010	Not relevant analysis

Lemola et al 2008	No intervention included
Edwards et al 998	More relevant to review 3

Smoking cessation in Secondary Care

Review 3 (Component 1)

Smoking cessation interventions in acute and maternity services:

Review of Barriers and Facilitators

Report to National Institute for Health and Clinical Excellence

Final Draft

22 August 2012

Katie Myers, Hayden McRobbie, Oliver West and Peter Hajek

November 2021: NICE guidelines PH45 (June 2013) and PH48 (November 2013) have been updated and replaced by NG209. The recommendations labelled [2013] or [2013, amended 2021] in the updated guideline were based on these evidence reviews. See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

TABLE OF CONTENTS

List of abbreviations

AAA	Ask, Advise, Act
AAAAA or 5As	Ask, Advise, Assess, Assist, Arrange
ABC	Ask, Brief Advice, Cessation Support
CABG/S	Coronary Artery Bypass Graft/Surgery
CAD	Coronary Artery Disease
CBT	Cognitive Behavioural Therapy
CCU	Coronary Care Unit
CHD	Coronary Heart Disease
CHF	Congestive Heart Failure
CI	Confidence Interval
CO	Carbon Monoxide
COHb	Carboxyhaemoglobin
COPD	Chronic Obstructive Pulmonary Disease
CVD	Cardiovascular Disease
ED	Emergency Department
EDD	Estimated date of delivery
FTND	Fagerstrom Test for Nicotine Dependence
FU	Follow-up
HCP	Health Care Professionals
HV	Health Visitor

ICU	Intensive Care Unit
ITT	Intention to treat
MI	Myocardial Infarction
MW	Midwife
NRT	Nicotine Replacement Therapy
O&G	Obstetrics and Gynaecology
OR	Odds Ratio
PCT	Primary Care Trust
PP	Point Prevalence
PVD	Peripheral Vascular Disease
RCT	Randomised Controlled Trial
RR	Relative Risk
SC	Smoking cessation
SOC	Stage of Change
SSS	Stop Smoking Services
TQD	Target Quit Date
TTM	Transtheoretical Model

Glossary

Throughout the document, ‘brief advice’ is contrasted with more intensive stop smoking interventions. Brief advice normally involves recommending that the patient stops smoking, with the recommendation supported by information on health risks of smoking. This can be supplemented by written materials and tips and advice on smoking cessation. More intensive interventions involve repeated contacts set up specifically to assist patients with smoking cessation.

Executive Summary

Introduction

Smoking cessation counseling and medications delivered in an acute hospital setting, combined with follow-up support after discharge, increase smoking cessation rates (NICE Review 2). Similarly, extended multi-session interventions aimed at helping pregnant women to stop smoking are effective (NICE Review 2). In contrast with the high intensity interventions, brief one-off interventions which can be delivered with minimal costs and which would be easier to implement on a large scale are of limited or no efficacy (NICE review 2).

Despite strong evidence of the effectiveness of intensive interventions and the availability of NHS specialist stop-smoking services funded to provide them, such interventions are far from universal. There seems to be a number of barriers to providing help to smokers in both acute and maternity care.

This review was set up to answer the following two questions posed by NICE:

1. How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation?
2. What barriers and facilitators affect the delivery of effective interventions?

Methodology

We systematically searched reviews and trials published between 1990 and December 2011 in English, but we also included literature published in early 2012 identified as relevant while work on the review was underway. The search terms and databases searched can be found in the review protocol in Appendix 1.

Search results

Searches of the databases returned 29083 records. A total of 163 papers were identified for full text retrieval.

Classifying papers included in the review

Papers were classified as:

1. **Studies (S)** – papers, which include original data.
2. **Discussions (D)** – papers which do not present any new data but consist of descriptions of current practice, discussions of issues, or reviews of or commentaries on other papers.

Applicability to the UK setting

Each paper was rated 1, 2 and 3 according to their relevance for informing UK practice (1=low relevance; 3=high relevance).

Structure of the review

Chapter 1 addresses barriers and facilitators in acute care and Chapter 2 covers the barriers and facilitators to delivering smoking cessation interventions in maternity care. The Chapters are divided into sections accompanied by comments on the main findings. Summary statements are provided at the end of each chapter.

Results

The review identified several barriers and facilitators of implementing evidence-based stop-smoking interventions in acute care.

1. **Smoking among health care staff is a barrier to engaging with smokers.** Healthcare Professionals (HCPs) who smoke report feeling awkward and guilty when advising smokers, they rate risks of smoking and benefits of quitting as lower than non-smokers, and they are less likely to engage in stop-smoking advice.

2. **Lack of time, knowledge and skills are the most commonly cited barriers to acute care staff intervening with patients who smoke.**
   Smoking cessation interventions that are expected to be provided by frontline healthcare staff need to be brief and easy to deliver. Asking about smoking and making a strong recommendation to seek help from the NHS-SSS tied with a referral, is an example of an approach that would minimise these barriers.

3. **Training healthcare professionals can have a positive effect on their practice.** Acute care staff cannot provide intensive interventions of the type known to be effective, but they can be instructed to identify smokers, make a strong recommendation that patients accept an offer of help from specialist staff, and assist with initiating treatment where need. Training needs to be brief and focus on practical issues and skills (i.e. identifying smokers and motivating them to accept referral for multisession treatment).

4. **Prompts, reminders, automated systems, and audit and feedback can assist HCPs in screening and offering smoking cessation treatment.**
   A range of prompts and reminders, from simple chart stickers to IT system prompts, aid HCPs to provide assistance to patients who smoke. Audit of patient records and patient review that is fed back to HCPs can also have a positive effect on practice.

5. **Organisational support is a key facilitator of stop-smoking activities.** Identification and referral of smokers with options of initiating treatment on wards cannot become a routine institution-wide strategy without the support from management.

6. **Smokers awaiting surgery can be advised to stop at any time.** The concerns that stopping smoking shortly before surgery may worsen surgery outcomes represents a common barrier to interventions with surgery patients. The concern is not warranted. Quitting early provides better health benefits,

but there is no evidence that stopping smoking within 8 weeks of surgery is associated with any adverse effects.

Evidence statements

E.S. 1.0 There is evidence that smoking among HCPs influences their knowledge and attitudes and represents a barrier to engagement with patients who smoke (O'Donovan 2009 [S-2], PEM 2005 [D-2], Slater 2006 [S-2], Xiao 2011 [S-1], Willaing 2004 [S-2], Bialous 2004 [S-1]).

E.S. 1.1 The main barriers to HCPs engagement with smokers include lack of time, knowledge, skills and viewing assisting smokers as being outside their job role (Bickerstaffe 2008 [S-3], May 2008 [S-2], McCarty 2001 [S-2], Thy 2007 [S-2], Warner 2004 [S-2], Warner 2008 [S-2]).

E.S. 1.2 Absence of stop-smoking medications on inpatient formulary, lack of chart reminders, and lack of staff knowledge represent commonly encountered barriers to prescribing stop-smoking medications within acute care (Goldstein 1999 [D-2]; Hawkshaw 2005 [S-2]; May 2008 [S-2]; Rigotti 1999 [S-2]; Vega 2010 [S-3]).

E.S. 1.3 There is evidence that identification of smokers can be improved by training HCPs (Carson 2012 [D-3]), Hill 2008 [S-3], Hodgson 2011 [S-3], Liu 2010 [S-3], Walsh 2007 [S-1], Ward 2003 [S-3]), introduction of prompts and reminders (Chang 1995 [S-3], Garrett-Szymanski 2006 [S-3], McDaniel 1999 [S-3], Nicholson 2000 [S-2]), and use of automated computer systems (Garret-Symanski 2006 [S-3]), Haile 2002 [S-2], Wolfenden 2007 [S-1]).

E.S. 1.4 There is evidence that training has a positive effect on staff practice in addressing smoking (Al-Alawy 2011 [S-3], Ballbe 2008 [S-2], Bryant 2008 [S-1], Freund 2009a [S-3], Gosselin 2011 [S-2], Kloss 2011 [S-3], Liu 2010 [S-3], Montner 1994 [S-1], Naudziunas 2005 [S-2], Vega 2010 [S-3], Walsh 2007 [S-1], Warner 2009 [S-1).

E.S. 1.5 Organisational support seems essential to implement institute-wide provision of stop-smoking support (Al-alawy 2011 [S-3], Bickerstaffe 2008 [S-3], Williams 2005 [S-1], Zhang 2005 [S-1]).

E.S. 1.6 Presentations and stands on wards and intensive involvement with hospital staff can improve awareness of SSS and increase referral rates (Hodgson 2011 [S-3], Hopkinson 2011 [S-3]).

E.S. 1.7 There is no evidence that the concern that stopping smoking only a few weeks prior to surgery might worsen clinical outcomes is justified (Myers 2011 [S-3]).

Chapter 2: Barriers and facilitators of providing effective stop-smoking treatment in maternity care

The review identified several barriers and facilitators of implementing evidence-based stop-smoking interventions in pregnancy.

1. **There are no serious barriers to recording the smoking status of pregnant women and this is done generally well.**

2. **The main barriers to MWs engaging in stop-smoking interventions include perceived lack of time and skills, belief that their advice is ineffective, and fear of damaging relationship with patients**. The existence of UK-SSS has been instrumental in overcoming these barriers, as MWs can be asked just to motivate and refer smokers.

3. **Training all MWs to encourage and refer smokers to stop-smoking advisors is feasible and productive**. MWs are generally not keen to engage in stop-smoking interventions themselves, and training them to do so has not been shown to improve quit rates. In contrast, a number of Primary Care Trusts (PCTs) have been successful in providing routine training to all MWs to motivate and refer smokers to SSS.

4. **The key features of successful NHS pregnancy services include organisational support, brief training of midwives in motivating and referring smokers, and provision of intensive multisession treatment by NHS-SSS specialists**. Dedicated pregnancy services have been funded by the NHS for the past 11 years. Two comprehensive surveys have evaluated their activities and they provide a wealth of data that can inform practical guidelines.

5. **There are two models of care. Referring pregnant smokers to advisors employed to work only with pregnant smokers, and referring to**

'mainstream' SSS. The latter achieves the same success rate at lower cost, but the former generates higher throughput

Evidence statements

E.S. 2.0 Midwives in the UK record smoking status of pregnant women routinely (Bryce 2009 [S-3]; Lee 2006 [S-3]; McGowan 2010 [S-3]; Taylor 2001 [S-3]).

E.S. 2.1 The main barriers to MWs engaging with smokers include perceived lack of time and skills, belief that their advice is ineffective, and fear of damaging relationship with patients (Abatemarco 2007 [S-3], Aquilino 2003 [S-2], Beenstock 2012 [S-1], Bishop 1998 [S-2]), Cooke 1996 [S-3], Cooke 1998 [S-3], Cooke 2000 [S-2], Hartmann 2007 [S-2], Herberts 2012 [S-3], Jordan 2006 [S-2], Valanis 2003 [S-3]).

E.S. 2.2 Regarding the perception by MWs that discussing smoking can be perceived by pregnant smokers as 'nagging', smoking women generally accept that smoking should be discussed as part of maternity care in both the pre- and post-natal periods (Groner 2005 [S-3], Wall 1995 [S-3], Winickoff 2010 [S-3], Herberts 2012 [S-3]).

E.S. 2.3 Monitoring and feedback on performance help to initiate and maintain desirable practice (Hyndman 2005 [S-3], Valanis 2003 [S-3]).

E.S. 2.4 Simple referral systems that involve minimal time and effort from midwives, are conducive to improved rates of advice and referral (Hartmann 2007 [S-2], Valanis 2003 [S-3], Windsor 2000 [S-2]).

E.S. 2.5 Training midwives in providing stop smoking interventions themselves (as opposed to referrals to specialist treatment) has limited impact on quit rates. (Albrecht 2011 [S-1], Bakker 2003 [S-1], Hyndman 2005 [S-3], Lin 2003 [S-NA], Wisborg 1998 [S-1]).

E.S. 2.6 Within the UK NHS, the best results are associated with PCTs which provide the following: Organisational support; brief but compulsory training of all

midwives to motivate smokers and refer them to SSS; specialist advisors offering multisession treatments accompanied by NRT; and provision of home visits where required (Bryce 2009 [S-3]; Lee 2006 [S-3]; McGowan 2010 [S-3]; Taylor 2001 [S-3]).

E.S. 2.7 There are two models of care. Referring pregnant smokers to advisors employed to work only with pregnant smokers, and referring to 'mainstream' SSS. The latter achieves the same success rate at lower cost, but the former generates higher throughput (Taylor 2001 [S-3]).

Conclusion

Most of the existing literature concerns health services with limited or no referral pathways to intensive treatments and it focuses on training front-line staff in brief routine interventions which are known to be ineffective. UK hospitals and maternity services have the option to refer smokers to specialist services and can in theory engage all staff in motivating and referring smokers. Such provision is currently in place in most maternity services. Within acute care however, this is not provided at all or provided inconsistently. The main barriers amenable to change include lack of organisational support, lack of clear referral pathways, and unrealistic training objectives.

Smoking cessation interventions in acute and maternity services:

Review of Barriers and Facilitators

Background to the review

Hospitalisation provides an opportunity for people to stop smoking. Smokers who are admitted to hospital are often highly motivated to quit and the hospital setting provides a potentially supportive environment to do so. Hospitals are smoke-free environments and admission brings people into direct contact with healthcare professionals who can advise on giving up smoking and offer evidence-based treatment. Similar considerations apply to pregnant smokers who use maternity services. Such smokers are usually motivated to stop smoking and their interaction with the maternity service offers ample opportunity to provide smoking cessation advice and treatment.

Smoking cessation counseling and medications delivered in an acute hospital setting, combined with follow-up support after discharge, increase smoking cessation rates. Smoking cessation interventions delivered to people awaiting surgery, which include follow-up care over several weeks, are also effective (NICE Review 2). Similarly, high intensity interventions aimed at helping pregnant women to stop smoking are effective (NICE Review 2). In contrast with the high intensity interventions, brief one-off interventions which can be delivered with minimal costs and which would be easier to implement on a large scale are of limited or no efficacy (NICE Review 2).

Despite strong evidence of the effectiveness of intensive interventions and the availability of NHS specialist stop-smoking services funded to provide them, such interventions are far from universal. There seems to be a number of barriers to providing help to smokers in both acute and maternity care. There is a need to systematically review not just the literature on the efficacy of stop smoking interventions, which are usually evaluated in a somewhat rarified research setting, but also the barriers and facilitators of stop smoking activities in real-life acute and maternity settings.

Review 3: Barriers & facilitators for smoking cessation interventions in acute & maternity services

Aim of the review

This review addresses the barriers and facilitators of smoking cessation interventions in acute and maternity services. It considers the following two questions:

1. How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation?

2. What barriers and facilitators affect the delivery of effective interventions?

Methodology

The review used a systematic approach to identify literature that provides information on the two questions above. The search also covered literature with information on the views (knowledge, attitude, beliefs) of service providers and service users, and any considerations of effects that the deliverer, setting, timing, frequency, duration of the intervention, as well as severity of dependence may have on the acceptability of the intervention.

The review does not cover literature relating to primary care unless acute care is involved, e.g. in referring patients. The review also does not cover mental health services.

Search strategy

The search strategy for Medline is shown in the review protocol (see Appendix 1). The review protocol also shows the list of electronic databases and websites that were searched. Other relevant references were identified from articles generated by the search and from our previous work in this area.

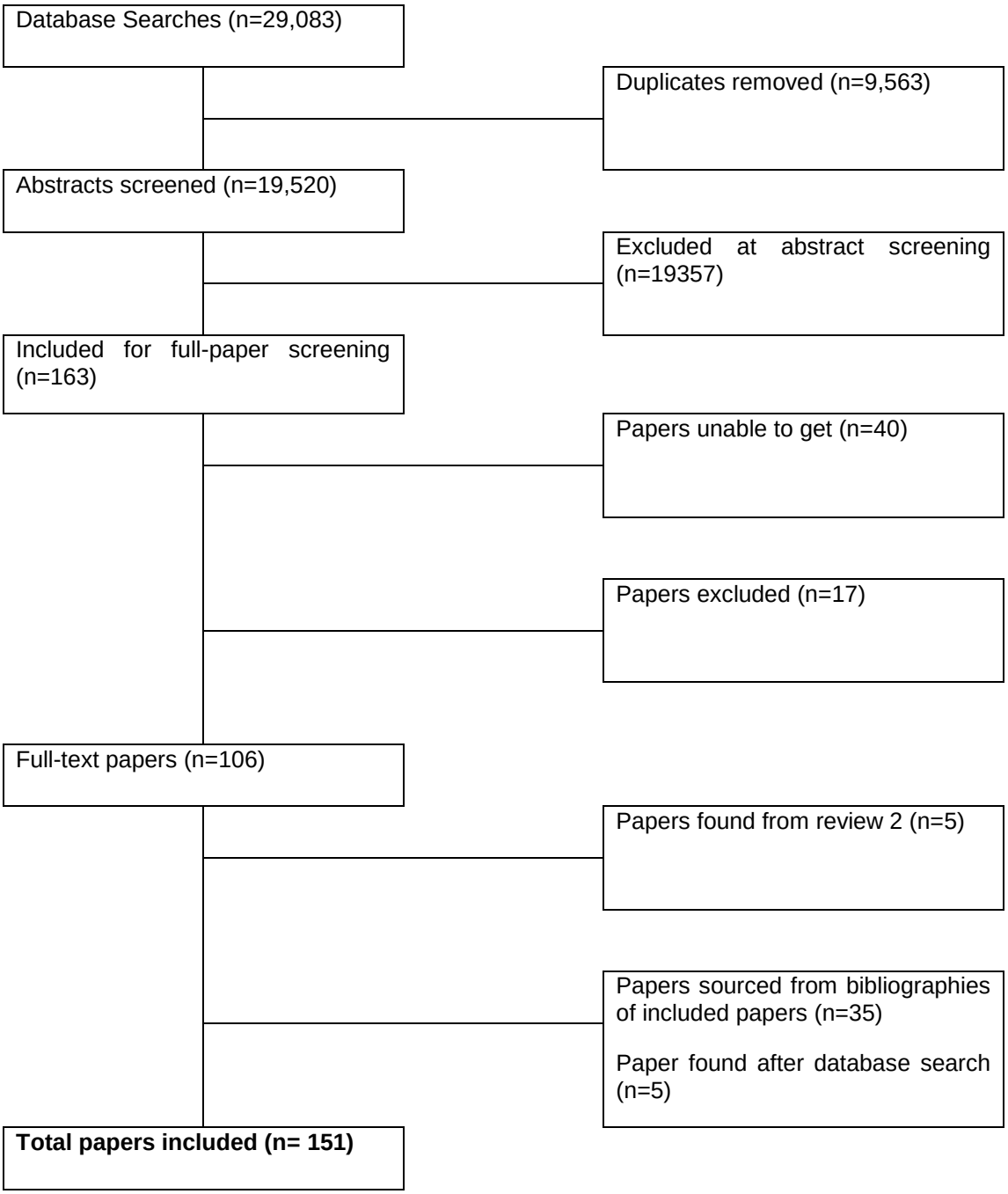
Inclusion Criteria

We included all relevant experimental, observational and qualitative studies, discussions, and descriptive reports published in English.

Search results

Searches of the databases returned 29,083 records. After duplicates were removed a total of 19,520 titles and abstracts were screened. Full papers were also obtained where there was no abstract and the relevance could not be assessed by the title alone. A total of 163 papers were identified for full text retrieval and 150 papers were included. A flow diagram illustrating the screening procedure is included in figure 1 below. Studies excluded at the full-paper screening stage are listed in appendix 4, along with a brief reason for exclusion.

Figure 1: Flow diagram of publications included in the review



Classifying papers included in the review

Papers were classified as:

Studies (S) – papers that include original data. These may be trials, surveys, meta-analyses, service audits or qualitative studies. S papers may be cited for their data, but also for issues flagged up in the discussion of the findings or implementation.

Discussions (D) – papers which do not present any new data but consist of descriptions of current practice, discussions of issues, or reviews of or commentaries on other papers

Applicability to the UK setting

Each paper was rated 1, 2 or 3 according to their relevance for informing UK practice (1=low relevance; 3=high relevance). This rating is not related to the quality of the papers. E.g. a paper from the 1980s reporting on smoking among staff in a Spanish hospital may be methodologically strong, but would be rated as 1 because it does not contain information useful in the current context. On the other hand, a news item in a UK nursing journal including an interview with a nurse describing problems with a local consultant who does not allow prescribing of NRT may be just an anecdotal report, but would be rated 3 as it flags up an issue relevant for the current NHS environment.

Data extraction

Due to the heterogeneous nature of the studies and the focus on qualitative issues concerning barriers and facilitators applicable to the UK health service, we only present one meta-analysis, concerning the impact of stopping smoking shortly before surgery on surgery outcomes.

Summary and evidence statements

Given the mostly qualitative and anecdotal nature of the reviewed material, a commentary is provided at the end of each section to discuss the findings.

We attempted to provide evidence statements where possible, but it is important to note that these are sometimes based on consensus and anecdotal observations rather than on robust data. Summary statements are provided at the end of each chapter.

Structure of the review

The results of the review are presented in two Chapters addressing the two settings of interest; acute care and maternity services.

Chapter 1 includes a separate section on smoking cessation interventions with patients awaiting elective and semi-elective surgery. This is because in this area a specific barrier was identified, i.e. a concern that stopping smoking within eight weeks of surgery increases risk surgery complications.

As in the area of smoking cessation help provided within health care systems, the UK is ahead of much of the international literature; both Chapters include separate sections on literature concerning current UK practice.

The Chapters are divided into sections accompanied by comments on the main findings. Summary and evidence statements are provided at the end of each chapter.

CHAPTER 1: BARRIERS AND FACILITATORS OF PROVIDING EFFECTIVE STOP-SMOKING TREATMENT IN ACUTE CARE

Introduction

While helping smokers is an important task for the health service in general, it is particularly relevant in acute care. Many patients access specialists and hospitals due to smoking related illness. Most of those who carry on smoking are highly dependent as otherwise, given their illness and the usual strong motivation to stop smoking; they would have quit by now. Smoking–related illness and hospitalisation are important windows of opportunity for smoking cessation interventions, and the close involvement with health care systems should make provision of such interventions relatively easy. Helping such smokers should be an important priority for health care staff, because in many cases stopping smoking facilitates recovery from illness and reduces the need for further demands on health service resources.

The UK health service is much more conducive to a successful adoption of the best practice by all staff than is the case in any other country. This is because the NHS established a Stop-Smoking Service (SSS) in 1999, and stop-smoking treatment is now widely available. This makes the task of the front line NHS staff much simpler than that of their counterparts in other countries. Staff need only advise smokers to quit and refer those who need help to the SSS. Even in such a simplified scenario however, there are a number of practical considerations, which influence practice. Our review focuses on issues identified in the UK and on international literature, which are relevant for NHS practice.

Identified literature

We found 112 studies that contained data relevant for this Chapter. These are summarised in Appendix 2.

Section 1: Smoking among hospital staff

Several studies highlight the relevance of staff smoking status. In the UK and Ireland, smoking among doctors is now rare, but smoking among nurses is similar to the smoking rate in the general population (Malek 2007, S-survey [1]; O'Donovan 2009, S-qualitative [2]) and smoking prevalence among psychiatric nurses can be as high as 47% (O'Donovan 2009, S-qualitative [2]). It is possible that smoking among health care staff is under-reported.

Healthcare Professionals (HCPs) who smoke report feeling awkward and guilty when advising smokers (Bialous 2004, S-qualitative [1]; PEM 2005, D [2]), they differ in their knowledge and attitudes regarding smoking from non-smokers (e.g. they rate risks of smoking and benefits of quitting as lower), and they are less likely to engage in stop-smoking advice (O'Donovan 2009, S-qualitative [2]; PEM 2005, D [2]; Slater 2006, S-survey [2]; Xiao 2011, S-service audit [1]; Willaing 2004, S-survey [2]). Ex-smokers have higher self-rated qualifications for counselling patients on smoking than current and never-smokers, but fall in between the two groups in the frequency of providing smoking cessation advice (Willaing 2004, S-survey [2]). Apart from lowering the likelihood of intervening with smokers, it is also possible that smoking among HCPs may reduce the impact of general anti-smoking messages.

Smoking prevalence in pre-registration UK nurses is similar to their registered counterparts (Blake 2011, S-survey [2]). As many nurses start smoking at nursing school, prevention and cessation efforts should be focused there (Slater 2006, S-survey [2]).

Six studies reported that when acute health services were becoming smoke-free, the prevalence of smoking among staff decreased (Olive 1996, S-survey [1]; Longo 2001, S-service audit [2]; Becker 1989, S-survey [1]; Stillman 1990, S-survey [1]; Batlle 1991, S-survey [1]; Xiao 2011, S-service audit [2]). The findings are mostly based on a comparison of pre- and post-ban surveys and need to be interpreted with caution because the policy implementation process may have made smokers more likely to avoid the second survey, or increase the incidence of misreporting. Such

concerns of course affect all cross-sectional findings of lowering of smoking prevalence at a time of increasing social stigmatisation of smoking.

Comment

Smoking among HCPs presents a barrier to engagement with patients who smoke. In the UK, there are stop smoking interventions available, which have proven efficacy with health care staff (NICE Review 2). Regarding the effects of a transition to smoke-free health service on staff smoking, the NHS is now smoke-free and whatever effects the transition to the new norm may have had on smoking among staff, this has already happened.

E.S. 1.0 There is evidence that smoking among health care professionals (HCPs) influences their knowledge and attitudes and represents a barrier to engagement with patients who smoke (O'Donovan 2009 [S-2], PEM 2005 [D-2], Slater 2006 [S-2], Xiao 2011 [S-1], Willaing 2004 [S-2], Bialous 2004 [S-1]).

Section 2: Other barriers to staff engaging in stop-smoking interventions

Lack of time, knowledge and skills are among the most commonly cited barriers for intervening at any level (Bickerstaffe 2008, S-service audit [3]; Thy 2007, S-survey [2]; Warner 2004, S-survey [2]; Warner 2008, S-qualitative [2]).

Other barriers include short hospital stays; and patients leaving wards for investigations and interventions, which make on-ward stop-smoking sessions difficult to deliver (Goldstein 1999, D-Commentary [2]; Rigotti 1999, S-prospective [2]; Thompson 2006, S-RCT [2]; Vaughn 2002, S-survey [2]).

Three papers reported that HCPs felt it was not their role to provide stop smoking interventions (May 2008, S-qualitative [2]; Thy 2007, S-survey [2]; McCarty 2001, S-survey [2]). Staff who have a speciality related to smoking (e.g. cardiology), were more likely to report offering advice that those who did not (McCarty 2001, S-survey

[2]). However, as reported earlier the number of HCPs discussing options for quitting is low across specialties (Segaar 2007, S-survey [3]).

Barriers to providing stop-smoking intervention in parents of hospitalised children

Barriers to providing parents with smoking cessation support were identified by Geller 2011 (S-survey [2]). These included parents' resistance to discussions about their smoking, short hospital stays, and non-standardised care. Fifty seven per cent of respondents indicated that they were not trained to discuss smoking cessation with adults. Nurses working in hospitals with smoking cessation plans or cessation counselling services for parents had much higher rates of assessing willingness to quit and assisting with a quit plan.

Barriers to initiating stop-smoking medications

Absence of NRT on inpatient formulary, lack of chart reminders, and lack of staff knowledge about stop smoking medications have been identified as the common barriers in this area (Goldstein 1999, D-commentary [2]; Hawkshaw 2005, S-service audit [2]; May 2008, S-qualitative [2]; Rigotti 1999, S-prospective [2]; Vega 2010, S-service audit [3]).

May 2008 (S-qualitative [2]) interviewed 13 members of staff from an acute cardiac care unit in the Australia where NRT was not used at all. The key barriers included the fact that NRT was not on the formulary and staff lacked relevant knowledge. Related to the latter, there were concerns about NRT cost and its safety. Several of the doctors surveyed felt that the decision to commence NRT lay with the patient's general practitioner or other health care advisor (e.g. pharmacist) as it was felt that they had a greater knowledge concerning the indication of NRT and contraindications for its use.

E.S. 1.2 Absence of stop-smoking medications on inpatient formulary, lack of chart reminders, and lack of staff knowledge represent commonly encountered barriers to prescribing stop-smoking medications within acute care (Goldstein 1999 [D-2]; Hawkshaw 2005 [S-2]; May 2008 [S-2]; Rigotti 1999 [S-2]; Vega 2010 [S-3]).

Section 3: Identifying patients who smoke

The first necessary pre-requisite of any stop smoking intervention is identifying whether a patient smokes. Hospitals that are more likely to record smoking status have been shown to perform better on indices of smoking cessation counselling (Williams 2005, S-service audit [1]).

Several interventions have been shown effective in increasing the rates of identification of patients who smoke. These are summarised below.

Staff training

Staff training can increase the rate at which HCPs screen for tobacco use (Carson 2012, D-systematic review [3]; Hill 2008 S-pre-post [3]; Hodgson 2011, S-service audit [3]; Liu 2010, S-service audit [3]; Walsh 2007, S-survey [1]; Ward 2003, S-survey [3]).

Prompts and reminders

Introducing chart reminders can increase substantially the identification of patients who smoke (Chang 1995, S-pre-post [3]; Garrett-Szymanski 2006, S-service audit [3]; McDaniel 1999, S-service audit [3]; Nicholson 2000, S-survey [2]).

Removing such prompts have led to a return to poor practice (McDaniel 1999, S-service audit [3]).

Lack of prompts to remind staff to routinely check smoking status is one explanation for low delivery of smoking cessation interventions by physicians in the US (Goldstein 1999, D-commentary [2]; Wolfenden 2009, D-commentary [1]).

Automated systems

Three studies examined the effect of systematic screening tools (Garrett-Szymanski 2006, S-service audit [3]; Haile 2002, S-pilot [2]; Wolfenden 2007, S-survey [1]).

Garret-Symanski 2006 (S-service audit [3]) showed that daily lists compiled by nurses caught only a quarter of smokers, compared to room-by-room assessment by nursing students. However the implementation of a mandatory field on hospitals electronic admission screen got 90%. A list of smokers and their location within the hospital could be generated daily.

Haile 2002 (S-pilot [2]) examined a computerised screening and counselling tool in patients attending a surgical preadmission clinic. The intervention was acceptable to both staff and patients. The majority of patients reported that the preadmission clinic was an appropriate place to help them stop smoking. Similarly Wolfenden 2007 (S-survey [1]) reported that a self-assessment of smoking status via touch-screen computer at a pre-admission appointment was acceptable to both staff and patients.

Screening for tobacco use in parents of hospitalised children

Whilst it is common for HCPs to ask their patients about smoking, parents of sick children appear to be less frequently asked about their smoking status.

Hymowitz 2005 (S-survey [2]) surveyed parents/caregivers of sick children who were taking part in a doctor training intervention study. Only half of smokers reported that the doctor offered them help to quit, and 25% were offered advice on protecting their children from second hand smoke. A barrier to discussing parent's smoking seems to exist across health care systems. Chan 2011 (S-survey [1]) surveyed paediatric ward nurses in Malaysia and found that two thirds did not document parent's

smoking status. The ward nurses reported identification of smoking parents was dependent on the child's diagnosis (e.g. smoking related) on admission.

Who should screen for tobacco use?

Administration staff usually have contact with all patients admitted to hospital, making them a potential workforce to screen for tobacco use. Schofield 1999 (S-service audit [3]) reported that only 63% of patients with urinary cotinine indicative of current smoking were actually recorded as a smoker by admin staff. However in most cases, clinical staff corrected the inaccuracy.

Although it may seem useful for administration staff to screen for tobacco use, it may be more clinically relevant for clinical staff to do this and to tie the screening question with the advice to quit and referral for treatment. Within the NHS, clinical staff could in theory initiate automated referrals to specialist advisors if the hospital systems allowed this.

Comment

Training staff in recording smoking status can be effective, but in practice it can also be demanding in terms of management, staff time, maintenance over staff changes, and monitoring. The most efficient and effective approach in health services where smokers can be referred for specialist treatment seems to be the use of automated systems, which can link smoker identification with triggering a referral.

E.S. 1.3 There is evidence that identification of smokers can be improved by training HCPs (Carson 2012 [D-3]), Hill 2008 [S-3], Hodgson 2011 [S-3], Liu 2010 [S-3], Walsh 2007 [S-1], Ward 2003 [S-3]), introduction of prompts and reminders (Chang 1995 [S-3], Garrett-Szymanski 2006 [S-3], McDaniel 1999 [S-3], Nicholson 2000 [S-2]), and use of automated computer systems (Garret-Symanski 2006 [S-3]), Haile 2002 [S-2], Wolfenden 2007 [S-1]).

Section 3: Provision of stop-smoking interventions

Staff training

A number of studies evaluated the impact of training staff in smoking cessation treatments on staff practices. Most of these studies were from health care systems with limited or no referral options and the focus was on getting doctors (and sometimes nurses) to treat smokers. Because hospital staff cannot provide multisession intensive interventions, the training typically focused on brief procedures, mostly of Intensity 1 and 2 (i.e. one or two sessions with no post-TQD follow-up). This poses a serious problem in that such interventions are known to have limited or no effect (NICE Review 2).

A number of papers reported on evaluations of such programmes (Al-alawy 2011, S-service audit [3]; Ballbe 2008, S-pre-post [2]; Bryant 2008, S-pre-post [1]; Freund 2009a, S-RCT [3]; Gosselin 2011, S-RCT [2]; Kloss 2011, S-service audit [3]; Liu 2010, S-service audit [3]; Montner 1994, S-pre-post [1]; Naudziunas 2005, S-survey [2]; Vega 2010, S-service audit [3]; Walsh 2007, S-survey [1]; Warner 2009, S-survey [1. This was usually done by testing knowledge and attitudes pre- and post-training (Ballbe 2008, S-pre-post [2]; Bryant 2008, S-pre-post [1]; Montner 1994, S-pre-post [1]; Vega 2010, S-service audit [3]; Walsh 2007, S-survey [1]; Warner 2009, S-survey [1]) by monitoring patient records for information on provision of interventions (Al-Alawy 2011, S-service audit [3]; Ballbe 2008, S-pre-post [2]; Kloss 2011, S-service audit [3]; Liu 2010, S-service audit [3]) and by interviewing patients (Freund 2009a, S-RCT [3]; Gosselin 2011, S-RCT [2]; Naudziunas 2005, S-Survey [2]). In most studies, training had an effect on staff practice, at least in a short term.

Interestingly, while staff self-appraisal can exaggerate their real activities (Palonen 2006, S-survey [2]), the opposite was also reported, i.e. staff reported knowing smoking status of 61% of patients, whereas 86% of patients reported being asked; staff said they advised 47% of patients to quit, whereas 55% of patients report receiving advice; and staff reported offering/providing NRT to 37% of patients, whilst 51% of patients said they were offered it; although only 23% reported receiving it (Freund 2009a, S-RCT [3]).

Regarding the question of what is a realistic duration of routine staff training, a survey of HCPs by Warner 2008 (S-qualitative [2]) found that US surgeons were willing to refer patients to local Quit lines and were amenable to receiving training, but this would need to be no more than 30 minutes long.

Bickerstaffe 2008 (S-service audit [3]) showed that using a work action group to champion smoking cessation training helped to promote it to staff.

Effects of prompts and reminders

Prompts such as stickers and chart reminders tend to increase the rate at which clinicians provide advice (Chang 1995, S-pre-post [3]; Cohen 1989, S-RCT [3]; Nicholson 2000, S-survey [2]). These findings are likely to be relevant in the UK setting where prompts and reminders could be used to increase rates of referrals.

Effects of feedback

Naudziunas 2005 (S-survey [2]) interviewed 56 CVD patients regarding the advice they received from their doctors on diet, monitoring, and relevant health behaviours including smoking. The results were then discussed with the doctors. This had a significant effect on doctors' practice. The following cohort of patients were much more likely to have their doctors discuss diet, cholesterol, smoking and relevant health behaviours with them.

Zhang 2005 (S-service audit [1]) tried to improve post-MI care in 38 hospitals by providing computerised data feedback to staff. This improved use of aspirin, beta-blockers etc. as well as delivery of stop-smoking advice.

Effects of automated systems

Koplan 2008 (S-service audit [3]) assessed the impact of adding a tobacco use template to a US hospital admission system. Coding a patient as 'smoker' prompted a drop-down menu of smoking cessation treatment and referral options for the physician to use. An audit of hospital records 4-months pre and post implementation of the template tool showed that it was used in 42% of all admissions and resulted in a small but significant increase in the proportion of patients that were referred for counselling (0.8 – 2.1%) and had NRT charted (1.6 – 2.5%).

Haile 2002 (S-pilot [2]) examined a computerised screening and counselling tool in patients attending a surgical preadmission clinic. The tool detected 56 smokers who went on to complete the interactive tailored (based on stage of change) cessation component. At follow-up 39% reported stopping smoking prior to surgery and the programme was rated as highly acceptable.

Wolfenden 2007 (S-survey [1]) reported that all the nurses and anaesthetists involved in a study using a patient self-assessment computer, found that the care prompts for smoking cessation that were automatically generated, very helpful. Staff found the system appropriate in offering pre-surgery patients stop smoking advice. The majority of the patients reported that the computerised counselling was easy to use and helpful alongside the provision of brief clinical advice and NRT.

How much can front-line staff do?

A consistent finding in the literature identified in this review is that the more HCPs are asked to do, the less likely they are to do it. HCPs are relatively good at screening for tobacco use and giving brief advice to quit, but are much less likely to provide further assistance (Schofield 1995, S-prospective [3]; Segaar 2007, S-survey [3]); Vaughn 2002, S-survey [2]; Vokes 2006, S-qualitative [3]; Von Garnier 2008, S-survey [3]; Von Garnier 2010, S-survey [3]; Warner 2009, S-survey [1]; Whyte 2006, S-qualitative [1]; Wilber 2011, S-service audit [2]).

Vokes 2006 (S-qualitative [3]) analysed audiotapes from doctor-patient interactions in an emergency department. Just over half were screened for smoking, with 56% of smokers given advice to quit, and 13% offered further help. Similarly in a survey of outpatients (Von Garnier 2008, S-survey [3]) contacted by phone within 24 hours after their hospital appointment, 81% were asked about smoking, 28% received advice on risks, 10% received advice to quit, and 9% were offered help to quit. Even in environments where HCPs may be more likely to act (e.g. cardiology nurses), although most (80%) assessed smoking status, less (60%) discussed options for quitting (Segaar 2007, S-survey [3]).

An obvious solution is to have dedicated staff providing treatment. Liu 2010 (S-service audit [3]) describes a dramatic improvement in a US hospital with poor record of addressing smoking. Each ward was allocated a stop-smoking advisor. Admission nurses only recorded smoking status and the advisors did the rest. Recording of smoking status and the provision of the intervention improved to some 90%.

Comment

The UK is now well ahead of the existing research in this area from countries where front line staff cannot refer smokers to specialists and so are trained to provide treatment themselves. Referral for smoking cessation treatment to carry on providing support after discharge from the hospital seems essential for the initial treatment to be effective. The meta-analyses undertaken in Review 2 demonstrated that hospital-based smoking cessation interventions are ineffective unless they include multi-session follow-up of 4-weeks or more post-discharge. Routine front line staff cannot take on the role of specialist advisors and organise extended support over a number of consultations set up just for this purpose. Even if they did, and such activities were given priority over their primary purpose, training tens of thousands of doctors and nurses in specialist interventions and supervising and monitoring them would be impracticable.

Since the establishment of the NHS Specialist Stop-Smoking Service (SSS), the task of front line staff in the UK is to motivate smokers to quit and refer them to SSS, rather than to take on the role of stop-smoking advisors.

The UK training or automated prompts can thus focus exclusively on motivating and referring smokers. There is evidence that a brief training (40 minutes) is effective in increasing referrals from UK GPs (McRobbie 2008). There is no reason to expect that the same approach would not work in acute care. Automated systems however should be much more cost effective and easier to implement. Such systems could also allow for easier and more consistent prescribing of smoking cessation medications for patients who need them. They would also allow performance management and timely feedback to staff. If a systematic approach to charting NRT is taken then it should be prescribed on an 'as required' (*pro re nata*; PRN) basis. Nursing staff may require some basic training in how to instruct patients to use these products.

Apart from organisational, financial, and time issues, we are aware of two other barriers to a routine implementation of training within acute care, which are not captured in the current literature. The notes below are only anecdotal, but they may be informative.

As a legacy from past initiatives, many PCTs continue to try to train front line staff in staging smokers using the trans-theoretical model and in smoking cessation interventions they are asked to provide themselves. Some others try to focus on the core tasks of motivating smokers and referring them on, but cannot resist including a host of marginal topics and making the training events unnecessarily long and demanding (e.g. half-day long). This makes such events expensive and poorly attended, without improving the chance that they will increase key activities more than a simple instruction. The key elements of effective training seems to be a briefing on encouraging patients to accept an offer of SSS treatment (backed by understanding of what SSS offers and of its efficacy), and arranging treatment at bedside or a post-discharge referral. We estimate that less than 30-minutes of training should be sufficient, especially if the hospital organisation is willing to include this as a part of compulsory induction of all new staff, and monitor the rates of

referrals for smoking cessation treatment and provide feedback to staff who under-perform. Some approaches tried in the UK so far are described in the section on Referral and collaboration with SSS below.

Another barrier to implementing such a pragmatic approach is that there exists no clear template for what such training should involve. Perhaps the UK Centre for Tobacco Control Studies (UKCTCS) which includes specialists with direct experience of smoking cessation interventions in acute care can be commissioned to develop a simple and straightforward training content which would be easy to disseminate. One possible hurdle to such a plan is the lack of consistency in the way different SSS operate.

E.S. 1.4 There is evidence that training has a positive effect on staff practice in addressing smoking (Al-Alawy 2011 [S-3], Ballbe 2008 [S-2], Bryant 2008 [S-1], Freund 2009a [S-3], Gosselin 2011 [S-2], Kloss 2011 [S-3], Liu 2010 [S-3], Montner 1994 [S-1], Naudziunas 2005 [S-2], Vega 2010 [S-3], Walsh 2007 [S-1], Warner 2009 [S-1).

Section 4: Organisational factors

Several reports point out the importance of organisational support in facilitating staff involvement. This includes primarily the involvement of senior hospital management, so that recording of smoking status and referring smokers to treatment, establishment of routine referral pathways, and access to stop smoking medications do not rely on individual HCPs good will, but form a part of their official duties.

Leadership

Hospitals with a good track record of implementing smoking cessation strategies rely on a network of senior management and clinicians to develop and monitor

adherence to the relevant protocols (Al-Alawy 2011, S-service audit [3]; Williams 2005, S-service audit [1]; Zhang 2005, S-service audit [1]).

In the UK, an example of organisational effort spanning acute and primary care has been published describing an initiative at Rotherham Foundation Hospital Trust (Al-alawy 2011 (S-service audit [3]). A steering group was set up comprising senior medical staff and PCT representatives. The main goals were setting up a new smokers' clinic, training front line staff in referral to the new clinic, setting up a patient group direction (PGD) to enable 'non-prescribers' to supply NRT, and review progress. There was some initial resistance from staff, due primarily to time constraints. Over 13 months, 269 front-line staff were trained (via professional development days or during staff handover), resulting in 890 referrals to the in-house stop smoking service, 414 quit dates, and 143 four-week quitters.

Having agreement from departmental leads to train all staff has been seen to increase the uptake of training in a pre-operative setting (Bickerstaffe 2008 (S-service audit [3]).

Changeover in management positions, particularly senior medical officers, have been reported to hamper implementation of such programmes (Freund 2009a, S-RCT [3]).

Performance management

Automated feedback on performance at departmental level can play an important role in maintaining good rates of identification and referral (Zhang 2005, S-service audit [1]). The creation of a dedicated tobacco control group (comprised of front-line and senior physicians and nurses, and executive management) transformed the practices of one large US hospital, increasing recording of smoking status to 90% (Liu 2010, S-service audit [3]). Wards were allocated dedicated smoking cessation advisors, leaving recording of smoking status as the only task for admission nurses.

Comment

The organisational task in the current NHS environment seems simple. When patients are admitted on the ward, the computer system could prompt clinical staff to ask whether the patient smokes, and if so, whether they would be interested in receiving help in quitting. A mouse click could trigger a visit by a smoking cessation advisor at bedside to initiate treatment if the hospital has such a service in place, or charting of smoking cessation medications and automated referral to local SSS on discharge.

Our own experience at the Royal London Hospital illustrates some of the barriers encountered in the NHS. The hospital computer system there was commissioned from a private company which charges tens to hundreds of thousands of pounds for including any new item. Questions regarding smoking status, and an option to refer were eventually included, but they had to conform to an unsuitable and clumsy format, and had to be hidden in an area several screens away from the front screen. Staff needed training in how to use the system, which proved impracticable. Despite a series of meetings of senior management, PCT and SSS, computerized referrals to the specialist working in the hospital remain at a negligible trickle. The bulk of referrals is by phone and e-mail from a few keen members of staff.

E.S. 1.5 Organisational support seems essential to implement institute-wide provision of stop-smoking support (Al-alawy 2011 [S-3], Bickerstaffe 2008 [S-3], Williams 2005 [S-1], Zhang 2005 [S-1]).

Section 5: Referral and collaboration with NHS SSS

We identified several reports referring specifically to the NHS SSS.

Hodgson 2011 (S-service audit [3]) reported a positive result of a simple intervention. An audit at an acute medical unit in Brighton showed that only 4% of smokers received any cessation advice. From the respiratory wards, only seven patients were referred to SSS over 6 months. Presentations were made to ward nursing staff by

the smoking cessation specialist nurse, and foundation trainees were nominated as ‘smoking champions’ to raise awareness among their peers. The respiratory wards referred 77 patients to the service over the next 6 months. Four-week cessation rate in these patients was reported to be remarkably high (82%).

A shared learning database page on NICE website includes a document describing hospital-based smoking cessation practice in Bolton Hospitals NHS Trust (Bickerstaffe 2008, S-service audit [3]). Hospital staff are receiving two types of training – Level 1, a brief intervention to motivate quit attempts (training takes 3 hours) and Level 2, an intermediate level assessment protocol to dispense NRT (training takes 6 hours). Patients need to be screened at both levels before receiving NRT. The training is being modified to include advice on diet, physicial activity and alcohol as well. Over a 6-year period, there were over 5,000 Level 1 referrals to SSS from some 1,000 staff who were trained to Level 1. Data are not available on how many of these referrals resulted in treatment attendance and successful quits. Over 4.5 years, there were 558 Level 2 assessments from 158 members of staff trained to Level 2. The document notes the concerns within the health service that quitting within 8 weeks of surgery may be detrimental to surgery outcomes due to increased mucus production (a common belief not supported by evidence – see Section 6). Training has been labour-intensive because staff finds it difficult to free the necessary amount of time and they are attending in only small batches. The document illustrates how enthusiastic individuals can drive desirable practice, but it also documents the common observation that local training programmes tend to be unnecessarily long.

Hopkinson 2011 (S-service audit [3]) designed a ‘care bundle’ for COPD patients discharged from a respiratory ward at a London hospital. This covered information on pulmonary rehabilitation, inhalers, follow-up appointments, COPD information and support resources, and referrals of smokers to community or clinic treatment. It was difficult for the staff to attend teaching sessions without impeding clinical work. Members of the team manned a stand on the ward providing teaching in a ‘drop in’ way. During the course of a shift all the nurses on the ward could be briefed with minimal disruption. Pharmacists involved in the project also taught staff daily. Regarding the smoking element of the Bundle, 25 smokers seen over 2 months were

all offered a referral for treatment (11 declined). The authors warn that educational efforts must be maintained because of staff turnover.

Comment

As discussed in the previous section, despite the potential simplicity of the UK system (staff can simply refer smokers to the NHS-SSS), many smokers are not offered such a referral. Presentations/stands on individual wards were successful. Some SSS employ advisors that can see patients on wards, but referring patients on discharge or from outpatient clinics to local SSS seems also a good option.

Under the pressure of local targets, some services have now dissolved specialist treatment provision, employ no dedicated stop-smoking clinicians, and rely instead on a large network of advisors such as pharmacists, health trainers, dentists, etc. The impact of this for acute care is that such services may have no specialists to whom acute care patients can be referred for multisession intensive treatment.

E.S. 1.6 Presentations and stands on wards and intensive involvement with hospital staff can improve awareness of SSS and increase referral rates (Hodgson 2011 [S-3], Hopkinson 2011 [S-3]).

Section 6: Smoking cessation interventions with patients awaiting surgery

A concern that has been circulating over the past two decades is that stopping smoking within a few weeks of surgery may not just be ineffective in reducing post-operative complications, but that it can contribute to them. It would appear that this concern originated from a 1989 paper that found postoperative pulmonary complications in 6 of 18 continuing smokers, compared to 12 of 21 ex-smokers who quit for less than 8 weeks prior to surgery (Warner 1989, S-retrospective [3]). The report did not include statistical analysis, but the authors suggested that losing the cough-promoting effect of cigarettes before any improvement in sputum clearance might predispose to retention of secretions and postoperative pulmonary

complications. Although the difference between the two groups is not statistically significant (chi-square=2.2; *p*=0.2), the warning has in some instances become accepted as a proven fact.

For example, an influential guidance document from the London Health Observatory states that 'Cessation should occur at least 8 weeks prior to surgery to minimise the increase in pulmonary complications in recent quitters' (Furlong 2005). The eight-week cut off point has also been recommended by other sources (Bluman 1998; Khan 2005). Patients are often scheduled for operations at relatively short notice, and an opportunity to discuss smoking may arise fairly late. Clinicians faced with smoking patients, or even with patients who pro-actively ask for help with stopping smoking, are often unsure whether they should provide smoking cessation treatment shortly before an operation.

Our preparatory examination of the existing literature on this topic identified two important methodological issues. Firstly, most existing studies focus on comparisons of early quitters (usually those smoke-free for more than two months before their surgery) and recent quitters (those smoke-free for only a few weeks or up to two months before their surgery), with never smokers. Of these three groups, recent quitters often have the poorest outcomes. This seems to form one of the sources of warnings about recent quitting. However, showing that recent quitters have more complications than early quitters and/or never smokers may simply mean that recent quitting is less beneficial than early quitting. Only a comparison with continuing smokers can show whether recent quitting poses a risk.

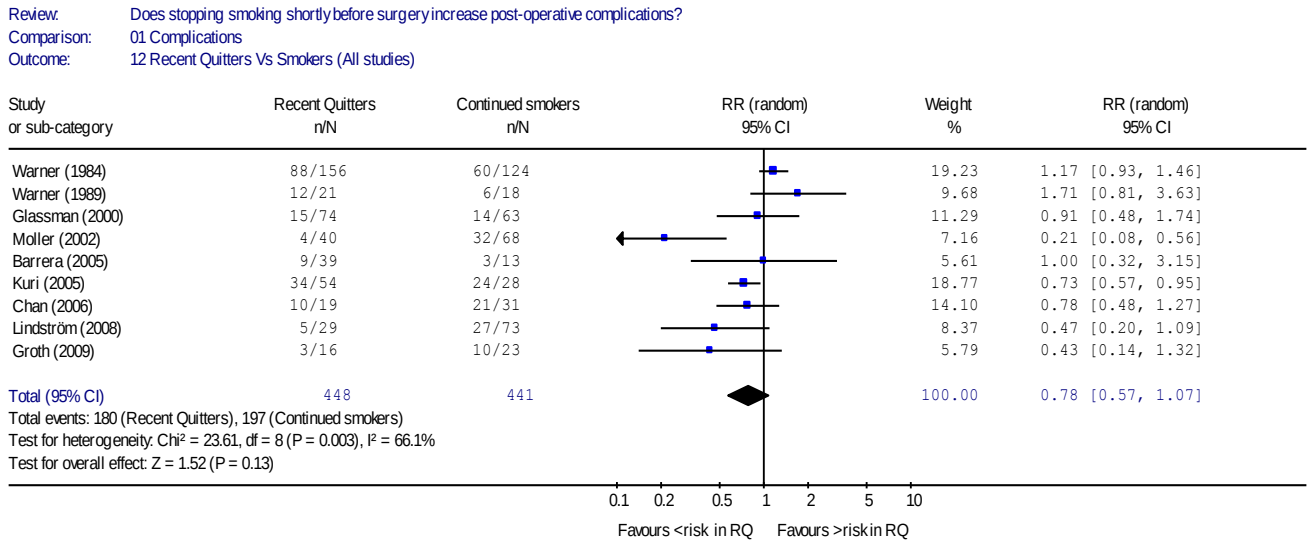
The second issue concerns biochemical validation of self-reported abstinence. Hospital patients are often acutely aware of the fact that smoking may have contributed to their illness, worry about the disapproval of clinical staff, and tend to misreport their smoking status (Woodward 1992; Bittoun 1991). If the sample of patients classified as recent ex-smokers contains a proportion who are in fact still smoking, this is likely to dilute any potential risks or benefits of recent quitting. Compared to studies based on self-reported smoking status, studies which

objectively validate self-reported abstinence of smoking provide more reliable evidence.

We addressed this issue in an earlier report to NICE and published our analysis (Myers 2011, S-meta analysis [3]).

A search of electronic databases identified nine studies that allowed comparisons of post-operative complications rates in patients who stopped smoking shortly before surgery and those who continued to smoke. Only one study found a beneficial effect of stopping smoking compared with continuing to smoke, but none of the studies identified any detrimental effects.

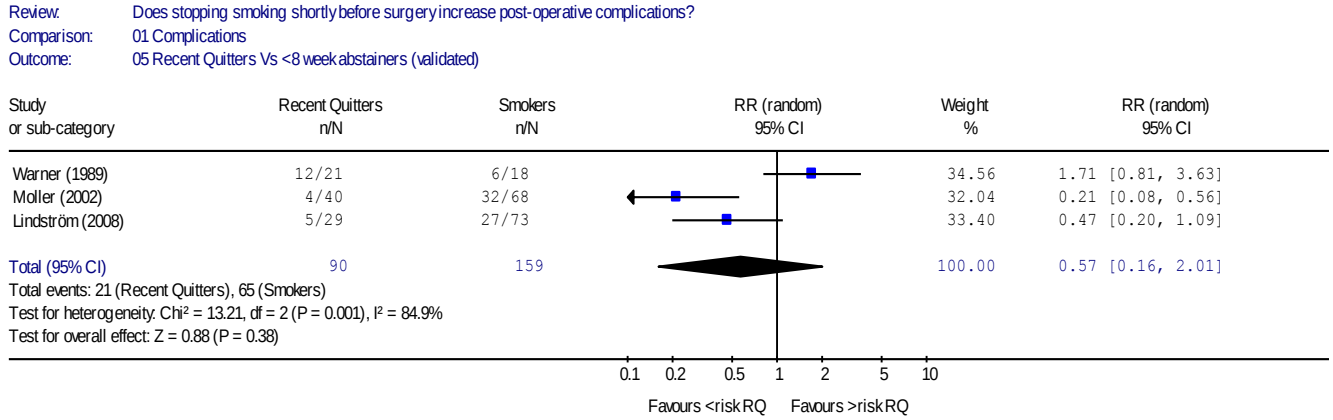
Figure 2: All nine available studies (RQ= recent quitters)



When all nine studies are combined there is no detrimental or beneficial effect of quitting shortly before surgery (RR, 0.78; 95% CI; 0.57-1.07).

Three studies, which had high quality scores and included validation of smoking status were combined.

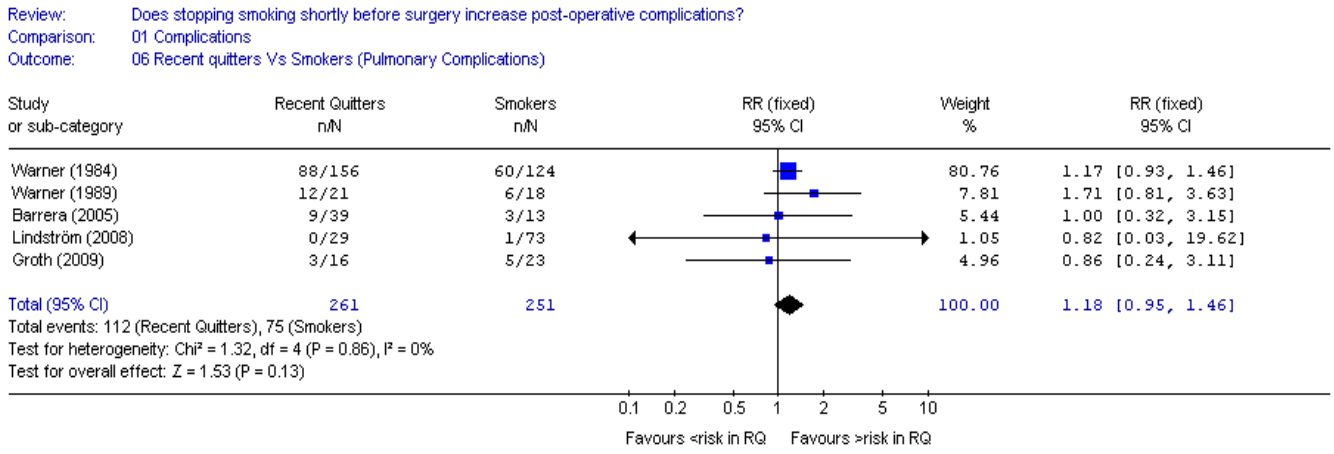
Figure 2: Studies with biochemical validation of self-reported abstinence



The results show no increase or decrease in overall postoperative complications (RR, 0.57; 95% CI; 0.16-2.01).

Four studies looked specifically at pulmonary complications.

Figure 3: Studies of pulmonary complications



Note: Groth 2009 (S-retrospective) [3]) lists number of complications rather than number of patients affected.

The results again show no increase or decrease in overall postoperative complications (RR, 1.18; 95% CI; 0.95-1.46).

Comment

Existing data indicate that the concern that stopping smoking only a few weeks prior to surgery might worsen clinical outcomes is unfounded. Patients should be advised to stop smoking as early as possible, but there is no evidence to suggest that health professionals should not be advising smokers to quit at any time prior to surgery.

E.S. 1.7 There is no evidence that the concern that stopping smoking only a few weeks prior to surgery might worsen clinical outcomes is justified (Myers 2011 [S-3]).

Summary Statements

The review identified several barriers and facilitators of implementing evidence-based stop-smoking interventions in acute care.

1. **Smoking among health care staff is a barrier to engaging with smokers.** Healthcare Professionals who smoke report feeling awkward and guilty when advising smokers, they rate risks of smoking and benefits of quitting as lower than non-smokers, and they are less likely to engage in stop-smoking advice.

2. **Lack of time, knowledge and skills are the most commonly cited barriers to acute care staff intervening with patients who smoke.** Smoking cessation interventions that are expected to be provided by frontline healthcare staff need to be brief and easy to deliver. Asking about smoking and making a strong recommendation to seek help from the NHS-SSS tied with a referral, is an example of an approach that would minimise these barriers.

3. **Training healthcare professionals can have a positive effect on their practice.** Acute care staff cannot provide intensive interventions of the type known to be effective, but they can be instructed to identify smokers, make a strong recommendation that patients accept an offer of help from specialist staff, and assist with initiating treatment where need. Training needs to be brief and focus on practical issues and skills (i.e. identifying smokers and motivating them to accept referral for multisession treatment).

4. **Prompts, reminders, automated systems, and audit and feedback can assist HCPs in screening and offering smoking cessation treatment.** A range of prompts and reminders, from simple chart stickers to IT system prompts, aid HCPs to provide assistance to patients who smoke. Audit of patient records and patient review that is fed back to HCPs can also have a positive effect on practice.

5. **Organisational support is a key facilitator of stop-smoking activities.** Identification and referral of smokers with options of initiating treatment on wards cannot become a routine institution-wide strategy without the support from management.

6. **Smokers awaiting surgery can be advised to stop at any time.** The concerns that stopping smoking shortly before surgery may worsen surgery outcomes represents a common barrier to interventions with surgery patients. The concern is not warranted, Quitting early provides better health benefits, but there is no evidence that stopping smoking within 8 weeks of surgery is associated with any adverse effects.

CHAPTER 2: BARRIERS AND FACILITATORS OF PROVIDING EFFECTIVE STOP-SMOKING TREATMENT IN MATERNITY SERVICES

Smoking by pregnant women has a range of potential negative consequences for the unborn child. As with users of acute service, users of maternity services are mostly aware of the potential benefits of stopping smoking, find stopping smoking on their own difficult, and can benefit from specialist help. Assisting them would appear to be an important priority for all maternity service staff.

We found 39 studies relevant to this section. A summary of these studies can be found in appendix 3.

The chapter is divided into 3 sections: Identification of pregnant women who smoke, Provision of interventions, and UK services for pregnant smokers

Section 1: Identification of pregnant women who smoke

Most midwives (MWs) screen for smoking routinely (Abatemarco 2007, S-survey [3]; Hartmann 2007, S-survey [2]; McGowan 2010, S-survey [3]). Almost all MWs who responded to a survey in an American study reported that they routinely ask about smoking and give advice to quit (Abatemarco 2007, S-survey [3]). Over 60% of O&G consultants in an American study said that they ask about smoking status at each visit (Jordan 2006, S-survey [2]). In a survey of 844 US maternity care providers 98% report that they routinely ask about smoking (Hartman 2007, S-survey [2]). In the UK, the recording of smoking status of pregnant women is a part of normal antenatal care and is done routinely across the country (Bryce 2009, S-prospective [3]; Lee 2006, S-survey [3]; McGowan 2010, S-survey [3]; Taylor 2001, S-survey [3]).

Pregnant smokers are sometimes reluctant to admit smoking to health professionals. Among a random sample of 3,475 pregnant Scottish women, 839 declared that they were smokers. The analysis of serum cotinine showed that 1,046 women were in

fact smokers, i.e. 19.8% of smokers did not admit that they smoke (Shipton 2009, S-retrospective [3]).

Where women are aware that a test of their smoke intake will be performed, the concordance of self-reported smoking and biochemical verification can be relatively high as participants are trying to avoid the potential embarrassment of a discrepancy between the two measures. E.g. in a UK study (Owen 2001, S-survey [3]), 161 pregnant women self-reported smoking and another 17 of those who reported to be non-smokers had salivary cotinine levels indicating smoking (i.e. 10% misreport rate). Some UK maternity services require all midwives to routinely monitor all pregnant women with CO monitors. This is likely to improve identification of smokers, although it is not clear whether this improves willingness to accept treatment. Having all midwives monitoring CO levels is expensive and it can be difficult to implement (McGowan 2010 S-survey [3]).

E.S. 2.0 Midwives in the UK record smoking status of pregnant women routinely (Bryce 2009 [S-3]; Lee 2006 [S-3]; McGowan 2010 [S-3]; Taylor 2001 [S-3]).

Section 2: Provision of stop-smoking interventions

NICE review 2 describes in detail the efficacy of different types of smoking cessation interventions with pregnant smokers. In brief, low intensity interventions (advice and written materials without follow-up support), have no effect, whereas high intensity interventions (interventions with regular contacts over several weeks) do increase abstinence rates. The rest of this section focuses on the barriers in implementing effective smoking cessation interventions, and what might be done to improve current practice.

While most maternity workers are good at identifying smokers and many give brief advice, they less often provide stop-smoking treatment (in health care systems which expect them to do so) or, in the UK, refer smokers to specialist services (Abatemarco

2007, S-survey [3]; Cooke 1996, S-survey [3]; Cooke 1998, S-survey [3]; Hartmann 2007,S-survey [2]; Jordan 2006, S-survey [2]). The reasons maternity care workers cite for not routinely providing assistance or referring patients have been well documented. The same barriers emerge from each study.

The standard barriers include lack of time; lack of knowledge and skills; belief that midwife-delivered treatments are ineffective; lack of staff and physical resources; and, as with monitoring smoking status, fear of damaging relationship with patients (e.g. a belief that patients may not be receptive to advice and attempts to offer it will be perceived as 'nagging') (Abatemarco 2007, S-survey [3]; Aquilino 2003, S-qualitative [2]); Beenstock 2012, S-survey [1]; Bishop 1998, S-qualitative [2]; Cooke 1996, S-survey [3]; Cooke 1998, S-survey [3]; Cooke 2000, S-RCT [2]; Hartman 2007, S-survey [2]; Herberts 2012 S-qualitative [3]; Jordan 2006, S-survey [2]; Valanis 2003, S-prospective [3]).

Another potential barrier to engaging with smokers is staff smoking. This has not been explored in this setting, but has been shown to influence acute care staff (see Chapter 1). It is likely that smoking among Midwives has a similar impact on practice. Fortunately, the issue is less urgent here because smoking prevalence among UK midwives is only 3% (Beenstock 2012, S-survey [1]).

Midwives who see smoking cessation as part of their role are more likely to be positive about smoking cessation advice (Bakker 2005, S-survey [1]).

A recent focus group study found that most of the 15 interviewed London-based midwives assumed that women who continue smoking when pregnant would not want to quit. The patients, on the other hand, wanted to know the facts about smoking effects on the foetus, with half feeling that they received inconsistent and insufficient information from midwives (Herberts 2012 S-qualitative [3]).

As with interventions in acute care, it seems that the more complex an intervention or set of guidance and the more steps are involved, the less likely it is to be successfully implemented in routine care (Windsor 2000, S-survey [2]). It is therefore not surprising that having a simple system to refer smokers, with minimal time and effort needed from midwives, is associated with better adherence (Hartmann 2007,

S-survey [2]). Simple questions about smoking status and interest in referral included in routine evaluation forms can increase rates of advice and referral. The shorter and less cumbersome such documentation is, the better (Valanis 2003, S-prospective [3]).

McGowan (2010 S-survey [3]) describes a successful 'opt-out' model provided to all pregnant smokers in Glasgow. The 'opt-out' system means that all smokers are referred to one of two trained specialist advisors and receive a phone call. They can opt-out then.

Monitoring and feedback on performance help to initiate and maintain desirable practice (Hyndman 2005, S-RCT [3], Valanis 2003, S-prospective [3]). This has been achieved through survey and interviews with staff and using team meetings to discuss progress of services, give feedback and to allow problem solving among the providers. Permitting individual sites and departments to alter processes to meet with differing needs across different settings was also reported to be useful, so long as key personnel are kept abreast of such changes (Valanis 2003, S-prospective [3]).

Many UK services operate a system, which seems optimal given the current evidence. They train all midwives to provide brief advice and refer smokers for specialist treatment, provided mostly by dedicated advisors employed specifically to work with pregnant smokers (Battersby 2003, S-service audit [3]). Another more economical option is a referral to local 'mainstream' service (Taylor 2001, S-survey [3]).

The standard barriers to implementing smoking cessation systems in prenatal care (e.g. time constraints, lack of training, etc.) are equally applicable to the postnatal setting. On the topic of healthcare workers' fear of mothers' resistance to receiving advice, and the potential damage to their relationship, studies of postpartum interventions found that the majority of patients were receptive to advice and agreed it should be discussed (Groner 2005, S-service audit [3]; Wall 1995, S-RCT [3]; Winickoff 2010, S-RCT [3]). This is important because health visitors, MWs and

paediatricians might believe that women who did not manage to quit despite the motivation of pregnancy may be either 'untreatable' or simply unwilling to quit. In fact, such patients could be highly dependent and in need of specialist treatment. The addition of a single question about smoking status on mothers' post-partum medical records increased substantially referral rates to a quitline in the US. The effect lasted beyond the duration of study (Winickoff 2010, S-RCT [3]). The same study also found an increased referral of fathers to the quitline in response to including a question on paternal smoking status.

E.S. 2.1 The main barriers to MWs engaging with smokers include perceived lack of time and skills, belief that their advice is ineffective, and fear of damaging relationship with patients (Abatemarco 2007 [S-3], Aquilino 2003 [S-2], Beenstock 2012 [S-1], Bishop 1998 [S-2]), Cooke 1996 [S-3], Cooke 1998 [S-3], Cooke 2000 [S-2], Hartmann 2007 [S-2], Herberts 2012 [S-3], Jordan 2006 [S-2], Valanis 2003 [S-3]).

E.S. 2.2 Regarding the perception by MWs that discussing smoking can be perceived by pregnant smokers as 'nagging', smoking women generally accept that smoking should be discussed as part of maternity care in both the pre- and post-natal periods (Groner 2005 [S-3], Wall 1995 [S-3], Winickoff 2010 [S-3], Herberts 2012 [S-3]).

E.S. 2.3 Monitoring and feedback on performance help to initiate and maintain desirable practice (Hyndman 2005 [S-3], Valanis 2003 [S-3]).

E.S. 2.4 Simple referral systems that involve minimal time and effort from midwives, are conducive to improved rates of advice and referral (Hartmann 2007 [S-2], Valanis 2003 [S-3], Windsor 2000 [S-2]).

Training staff in stop-smoking interventions

Several studies evaluated staff training programmes. There is little evidence that such training improves cessation rate among patients. This is most likely because the training programmes focus on brief interventions which lack efficacy.

Albrecht (2011, S-retrospective [1]) trained staff in a US clinic in the 5As approach. A total of 144 smokers were recruited and 22 were 'able to abstain for at least part of the evaluation period'.

In a Dutch study, midwives were given an intervention manual, a prompt card, videos for clients, and either received training or not (this was not randomised). Midwives and clients were then asked to fill in questionnaires about practice. The trained midwives reported they provided interventions more frequently. Clients however did not corroborate this (Bakker 2003, S-survey [1]).

One study randomised hospitals to an intervention that aimed to increase adherence to clinical guidelines (academic detailing visits plus self-study package) or usual care. The intervention enhanced adherence to guidelines. It is not known if this had an effect on smoking cessation outcomes (Hyndman 2005, S-RCT [3]).

Lin (2003, S-service audit [NA]) reported on an intervention that trained staff in brief counselling. Pre-post analyses showed that training led to better records, but had no effect on smoking cessation rates among patients.

Wisborg (1998, S-RCT [1]) assessed the effect of training midwives on cessation using a quasi-random design. Training had no impact on cessation compared to non-trained midwives.

E.S. 2.5 Training midwives in providing stop smoking interventions themselves (as opposed to referrals to specialist treatment) has limited impact on quit rates. (Albrecht 2011 [S-1], Bakker 2003 [S-1], Hyndman 2005 [S-3], Lin 2003 [S-NA], Wisborg 1998 [S-1]).

Section 3: UK services for pregnant smokers

This is the key section of the present Chapter, because it covers the literature addressing specifically the provision of stop-smoking treatments in the UK setting.

From the year 2000, NHS-SSS received £3,000,000 per year to target pregnant smokers (Lee 2006). Two separate studies evaluated these dedicated pregnancy services. They generated a series of findings relevant for clinical guidelines.

Study 1 - Taylor (2001, S-survey [3])
When the initial funding was allocated to treat pregnant smokers, no guidelines or recommendations as to how this should be done were provided.

In 2001, the Health Development Agency commissioned a survey to examine how Health Authorities (HA) were using the funds, and to identify approaches which appear the most effective. At the time of the survey, England was divided into 99 HAs. All HAs responded to the initial short questionnaire. Thirty services that reported that they have been functioning for at least three months were visited and interviewed.

Staff: 25 services employed dedicated staff, the remaining 5 tried to include stop-smoking counselling in routine duties of all MWs.

Recruitment: Self-referrals via advertisements and GP referrals were unsuccessful. Asking MWs to verbally pass on client details to the advisors, and advisors waiting in antenatal clinics to pick up referrals opportunistically did not work either. The only approach which generated referrals consisted of midwives sending referral cards to advisors.

Treatment: 8 services were offering 1-3 sessions, 22 services offered 6+ sessions. Eleven services used ‘Stages of Change’ approach, 10 services used Withdrawal-Oriented Treatment, others used less common approaches generated by local enthusiasts including visualisation exercises, practicing stopping before the quit date, self-help books, and a computer-assisted package (purchased by the service for £25,000). 10 services gave pregnant smokers priority access to their mainstream clinics, rather than employing a separate advisor.

18 services used CO monitors, the rest felt that this implied mistrust in women, or did all sessions over the phone and had no face-to-face contact with smokers.

6 services did not use NRT, the others used it at least occasionally. They had to ask doctors to prescribe and this was sometimes refused. Interviewees felt that guidelines on NRT use in pregnancy are urgently needed.

Throughput and outcome: To calculate throughput and outcome, services data were scaled to the equivalent of one full-time staff member working for one year. Data problems were encountered which still persist. These included different definitions of outcome, inclusion of smokers who intended to quit or only smokers who actually made a quit attempt, 5 services reported as service successes all women who reported at the first contact with MW that they used to smoke but do not smoke any more (these 5 services were not included in figures below). One service did not ask smokers to set a quit date and only recorded a quit date if clients actually quit, resulting in 100% success rate. Another service had no figures at all.

Services with dedicated staff scaled to one full time advisor per year would treat 70 smokers per year (range 5-207) with 19 self-reported and 16 validated quitters at 4 weeks.

Two services were run by routine midwives expected to offer intermediate or intensive interventions (as opposed to brief one-off intervention). One could not provide interpretable data, in the other 21 women set a quit date and one managed self-reported abstinence at 4 weeks.

Intensive services set more quit dates (73 vs. 39) and generated more quitters (20 vs 9) than services using brief approaches.

Services run by advisors with other than MW background generated the same number of validated quitters as those where advisors were MWs (17 vs. 16).

The 10 services using mainstream clinics had lower throughput (17 vs. 42 women setting a quit date, with 6 vs. 11 self-reported 4-week quitters) but generated no extra cost.

Costs: The average staff salary cost per 4-week quitter was £3,309 (range £611 to £13,978), i.e. some £10,000+ per one-year quitter. This does not include management, medications, and running costs. It is not known how many of the women would quit smoking without SSS help.

Study 2 - Lee (2006, S-survey [3])

In 2004, the Health Development Agency commissioned another survey to identify examples of best practice in the by now fully developed field, with a view of developing guidance for practitioners.

As service reports were shown to have inconsistent reliability, the study involved a researcher familiar with both stop-smoking practices and with data collection and reporting methodology visiting the key sites to assess the quality of reported data and to describe practice details. Data were obtained from 245 PCTs. There were large differences in their reported throughput and outcome, suggesting differences not just in clinical practice but also in data reporting.

Two types of services were approached: Three services that reported the highest numbers of treatment successes in the DoH returns; and three services known in the field as examples of best practice, e.g. presenting at conferences and contributing to training initiatives ('beacon services').

Highest ranking services: The three highest scorers were marked by a combination of exceptionally high throughput (169 to 235 pregnant smokers treated per year) and success rates close to 100%. On closer examination it transpired that all three services counted women who reported at delivery to be smoking in the past but not now, as service successes. No useful lessons were derived from this other than a question mark about the accuracy of national data monitoring. One of these PCTs had a genuine dedicated service, with results similar to national average from the previous survey (51 smokers treated, 33% self-reported success rate at 4 weeks).

The beacon services: All three of these services provided genuinely exceptional output considerably above the national average found in the previous survey. They treated 120 – 267 smokers per year with 37% to 48% CO validated quit rates. The services differed in size (two of them covered 3 PCTs), staffing levels and other aspects of their activities, but they all shared several key elements, which were probably related to their success.

Recruitment: All three services received their referrals from local MWs. They all provided brief training sessions for MWs on how to refer pregnant smokers, rather than how to treat them. Two of them managed to make such training compulsory. All emphasized the crucial importance of having the full support of heads of midwifery. This corresponds with previous findings that relying on advertising to general public, self-referrals, and on trying to recruit smokers directly from surgeries is not productive.

Use of medications: All three services offered NRT to almost all pregnant smokers, and had an efficient system of providing the prescriptions. Although the evidence of NRT efficacy in pregnant smokers is lacking (see Review 2), it is possible that the efficacy is higher with intensive support. It is also likely that the presence of medication makes the service more attractive and stimulates confidence among both staff and patients.

Flexible home visits: All three services offered this. Although such provision is labour intensive, it was felt that it makes the services more attractive to users, and that it improves recruitment, patients' retention, and outcome. Inviting pregnant women to attend clinics generated a lower response.

Treatment format: All three services provided intensive multi-session treatment delivered by a small number of full-time staff. This tallies with previous findings that relying on brief advice by all primary care staff or training a large cohort of midwives to deliver interventions with their own patients is not productive.

The three services also differed in several aspects, as can be expected in an area where no practical guidance existed. Their data collection procedures and data quality differed, and there were large differences in costs. Scaled to common denominator, two full time advisors in one service were achieving the same results as four full time staff in another.

Other UK reports

We identified several other reports, which refer specifically to SSS.

McGowan (2010 S-survey [3]) describes a model service at 3 maternity units in Glasgow, which among them see some 12,000 pregnant women a year. The paper provides information about one reasonably successful model of the service. At maternity booking all women are expected to be asked by MWs to provide a CO reading. Smokers receive an 'opt-out' referral to one of two trained specialist advisors who provide NRT under PGD. The 'opt-out' system means that all smokers are referred and receive a phone call. They can opt-out then. Most other smoking cessation services for pregnant women are 'opt-in', i.e. women are asked if they want to be referred. One report suggests that about half accept the offer (Bryce 2009 S-prospective [3]). In the Glasgow service, the opt-out system generated a high rate of referrals. The added benefit of the system is the opportunity it provides for encouragement and motivation during the first telephone contact by a specialist. There were concerns that women may resent the phone calls, but the calls were generally well received and generated no complaints. The system is labour intensive – 2,500 telephone contacts were required for 370 women to join the treatment programme.

MWs had difficulty with including routine CO monitoring into their schedule. Compliance with CO monitoring was only 35%. However, in a hospital where this task was given to auxiliary nurses, 89% of women provided a breath sample.

Overall, of women referred, 19% (370) set a quit date and 117 (32%) were self-reported 4-week quitters. Treatment consisted of one face-to-face session followed by weekly phone calls. There was a concern that providing home visits is expensive and exposes midwives to at least the fear of assault from partners of pregnant smokers, particularly in areas of high deprivation.

A briefing paper by Jones (2012, Discussion [3]) provides an overview of the current service delivery in Wales. Core SSS is used rather than dedicated pregnancy advisors. Midwives refer pregnant smokers and specialist advisors contact clients twice by telephone, and send a letter if there is no response. Clients are fast tracked into an appointment to allow for the longest cessation period during their pregnancy. Clients are offered sessions for intensive support at existing community based groups, on a one to one basis at a clinic/venue where SSW usually hold sessions, or support over the phone. This seems to be an efficient and economical system, though the authors point out that women are not supported throughout their pregnancy and after delivery, and the service does not offer home visits. Regarding on-going 'maintenance' support, experience in the field suggests that very few clients attend follow-up appointments. Routine home visits by dedicated stop-smoking advisors are an expensive provision, unprecedented in behaviour change interventions, but they can enhance service reach.

Bryce (2009, S-prospective [3]) describes another Glasgow initiative (CATCH), which includes referrals of pregnant smokers to SSS by MWs. 152 smokers were referred during a 16-month period of whom 79 (52%) joined treatment. This time, treatment included home visits by trained MW who provided NRT under PGD. Treatment outcome was very good - 20% were validated abstainers at 3 months and 13% at 12 months.

The higher success rate of more intensive treatment tallies with the findings from randomised controlled trials. Such treatment, including home visits, was also provided by the 'beacon' services as described earlier.

E.S. 2.6 Within the UK NHS, the best results are associated with PCTs which provide the following: Organisational support; brief but compulsory training of all midwives to motivate smokers and refer them to SSS; specialist advisors offering multisession treatments accompanied by NRT; and provision of home visits where required (Bryce 2009 [S-3]; Lee 2006 [S-3]; McGowan 2010 [S-3]; Taylor 2001 [S-3]).

E.S. 2.7 There are two models of care. Referring pregnant smokers to advisors employed to work only with pregnant smokers, and referring to 'mainstream' SSS. The latter achieves the same success rate at lower cost, but the former generates higher throughput (Taylor 2001 [S-3]).

Comment

MWs and other health care staff are generally good at asking about smoking status of pregnant women, but they are less likely to engage in stop-smoking interventions. The common barriers include lack of time, knowledge and skills; belief that such interventions are ineffective; and concerns about damaging relationship with patients. MWs belief that their own brief interventions are not effective is actually probably an accurate perception. Review 2 reported that advice to pregnant smokers lack efficacy unless it is accompanied by extended multisession support.

Training MWs in providing stop-smoking interventions have not been shown productive. Training however influences practice, and training in encouraging and referring smokers (rather than in trying to treat them) seems to be a productive approach.

Most NHS SSS employ dedicated pregnancy advisors and they ask front-line midwives to motivate and refer smokers to the specialists rather than to provide treatment themselves.

The specialist pregnancy UK service started hesitantly. Lack of guidance meant that many local services were trying to implement approaches, which may appear sensible and economical, but were already known at the time to lack efficacy. The early experience was captured by an extensive survey, which confirmed the need for straightforward referral systems and specialist advisors. A later survey focused on best performing services. It identified a series of features associated with exceptional results. These included institutional support (i.e. collaboration of Heads of Midwifery to make MWs training and activities a routine part of their jobs), compulsory training of MWs in referring patients, provision of intensive multisession treatment by dedicated specialists, use of NRT (which may increase attractiveness of the service and confidence of patients and staff), and flexible home visits. Other publications covering UK services corroborate these findings.

Regarding the service configuration, most PCTs fund a dedicated pregnancy-only service, although some refer pregnant smokers to their mainstream services. The latter arrangement achieves the same success rate with little or no extra costs, but it generates a lower throughput. Recommending one approach over another depends on available funds and competing priorities. Perhaps both have their place within different local services.

Summary Statements

The review identified several barriers and facilitators of implementing evidence-based stop-smoking interventions in pregnancy.

1. **There are no serious barriers to recording smoking status of pregnant women and this is done generally well.**

2. **The main barriers to MWs engaging in stop-smoking interventions include perceived lack of time and skills, belief that their advice is ineffective, and fear of damaging relationship with patients**. The existence of UK-SSS has been instrumental in overcoming these barriers, as MWs can be asked just to motivate and refer smokers.

3. **Training all MWs to encourage and refer smokers to stop-smoking advisors is feasible and productive**. MWs are generally not keen to engage in stop-smoking interventions themselves, and training them to do so has not been shown to improve quit rates. In contrast, a number of PCTs have been successful in providing routine training to all MWs to motivate and refer smokers to SSS.

4. **The key features of successful NHS pregnancy services include organisational support, brief training of midwives in motivating and referring smokers, and provision of intensive multisession treatment by NHS-SSS specialists**. Dedicated pregnancy services have been funded by the NHS for the past 11 years. Two comprehensive surveys have evaluated their activities and they provide a wealth of data that can inform practical guidelines.

5. **There are two models of care. Referring pregnant smokers to advisors employed to work only with pregnant smokers, and referring to 'mainstream' SSS. The latter achieves the same success rate at lower cost, but the former generates higher throughput**

Overall Conclusion

Most of the existing world literature concerns health services with limited or no referral pathways to intensive treatments and it focuses on training front-line staff in brief routine interventions which are known to be ineffective. UK hospitals and maternity services have the option to refer smokers to specialist services and can in theory engage all staff in motivating and referring smokers. Such provision is currently in place in most maternity services. Within acute care however, this is not provided at all or provided inconsistently. The main barriers amenable to change include lack of organisational support, lack of clear referral pathways, and unrealistic training objectives.

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Appendices

Appendix 1: Review Protocol for Reviews 2 & 3

Overview of project

The National Institute for Health and Clinical Excellence (NICE) has been asked by the Department of Health to develop two separate pieces of complementary guidance on:

- 'Smoking cessation in secondary care: acute and maternity services'
- 'Smoking cessation in secondary care: mental health services'.

The guidance will address smokefree policies and smoking cessation and make recommendations on approaches to help secondary care commissioners, professionals and managers (including patients and service users and their family or carers, visitors and staff) in hospitals and other acute, maternity or mental healthcare settings (including emergency care, planned specialist medical care or surgery, and maternity care provided in hospitals, outpatient clinics, community outreach and rural units, as well as intensive services in psychiatric units and secure hospitals).

There are five components of work associated with the guidance development:

1. Smoking cessation in acute and obstetric services: one review of effectiveness and one review of barriers and facilitators (reviews 2 & 3).
2. Smoking cessation in mental health services: one review of effectiveness and one review of barriers and facilitators (reviews 4 & 5).
3. Smokefree strategies and interventions in secondary care settings: one review of effectiveness and one review of barriers and facilitators (reviews 6 & 7).
4. An economic analysis (cost effectiveness review and economic model)
5. Review of effects of nicotine in secondary care (review 1)

The CPHE has commissioned the National Centre for Smoking Cessation and Training (NCSCT) to deliver four of these components (1,2,3 and 5).

This review protocol sets out the process for Component One - Smoking cessation in acute and maternity services: one review of effectiveness (review 2) and one review of barriers and facilitators (review 3).

Review 3: Barriers & facilitators for smoking cessation interventions in acute & maternity services

The aim of these reviews is to answer key questions as set out in the final scope document for the guidance on 'Smoking cessation in secondary care: acute and maternity services'.

The Review Team

This review will be led by Miss Katie Myers. She has led a NICE review of Relapse Prevention Interventions in Pregnancy[1] and was the lead author on the Pre-operative Smoking Cessation systematic review[2]. Ms Myers has experience in searching literature for systematic reviews and project management. Professor Hajek will lead on the writing of the review. He has a long history of working with NICE and extensive experience in systematic reviews[1-6]. Dr McRobbie will assist the Project Team with literature screening and quality appraisal. He has led on a NICE systematic review (see McRobbie et al 2006[3]) and is an author of two Cochrane Systematic Reviews[7 8] and another recent systematic review[2]. Dr McRobbie was also a lead author of the literature review for the New Zealand Smoking Cessation Guidelines[9].

Mr Nigel Chee will provide expert project management support to the Project Team given the tight timeframes for this Component. He is an experienced manager with experience in managing large and complex health research, strategy, policy and implementation projects. He is also a co-author of the Clinical Guidelines for Weight Management in New Zealand Adults and the Clinical Guidelines for Weight Management in New Zealand Children[10]. He will primarily focus on driving the process for the project to ensure timelines are met and will also manage the relationships between the key stakeholders (including the Project Team, Independent Information Specialist, collaborators, NCSCTC CIC and NICE).

Independent Information Specialist

In addition to the skills and experience of the Project Team an independent information specialist (Ms Claire Stansfield) from the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) will provide advice on the search strategy and the approach to undertaking the literature search. Ms. Stansfield has extensive expertise in methods for identifying research for systematic reviews, is familiar with the syntax requirements of the databases used in NICE systematic reviews, and is a member of the Cochrane Collaboration's Information Retrieval Methods Group.

Collaborators

This review will also involve several other collaborators (listed below) who are leading components 2 and 3. The rationale for involving these wider collaborators is that we believe there are significant overlaps between the four components.

Although each component "stands alone", we believe that working as a broader collective team will enable synergies across the work to be completed. The wider team is multi-disciplinary consisting of health and clinical psychologists, clinicians, research nurses, epidemiologists and medical statisticians and covers a wide range of specialist technical expertise including mental health care, secondary care and tobacco control research.

- Professor Ann McNeill (University of Nottingham);
- Dr Jo Leonardi-Bee (University of Nottingham);
- Dr Rachael Murray (University of Nottingham);
- Dr Elena Ratschen (University of Nottingham);
- Professor Sarah Lewis (University of Nottingham);
- Ms Kathryn Angus (University of Stirling); and
- Mr Douglas Eadie (University of Stirling).

The review process

This review will involve the following steps, which are described further within this protocol.

1) Searching and retrieval of relevant evidence/studies as outlined in the search protocol and strategy (see Appendix 1)
2) Selecting relevant evidence/studies using appropriate title/abstract screening checklists (see Appendix 2). Titles/abstracts will be screened independently by two reviewers.
3) Retrieval of full papers assessed to be potentially relevant following title/abstract screening.
4) Full papers will be screened independently by two reviewers and quality assessed using the NICE quality appraisal checklists (see Appendices 4-6).
5) Data will be extracted from each paper and entered into data extraction tables (see Appendices 7 & 8).
6) Data will be collated and presented in evidence tables, narrative summaries, summary tables, graphical presentation, and meta-analysis where appropriate. Sensitivity analyses related to inequality measures will be carried out, where possible.
7) Evidence statements and applicability statements will be formulated.

Project deliverables

Review 2

At the completion of this process the review team will:

1 Submit a **1st draft of the review** to the NICE Team by 16 March 2012
2 Undertake any amendments to the draft following NICE comments and provide a revised draft (**2nd draft**) by 9 April 2012

Review 3: Barriers & facilitators for smoking cessation interventions in acute & maternity services

3 Present the review findings to the PDG meeting on 25 April 2012
4 Undertake any amendments to the reviews following comment from the PDG and summit a **3rd draft by** 8 May 2012
5 Provision of written contributions and technical support during and after the completion of the reviews, as required during the development of the public health programme guidance. This will include:
   - Supporting the NICE Team in responding to any stakeholder comments on the reviews during the consultation on the evidence and draft guidance (consultation is currently planned for April to July 2013).
   - Attendance at PDG meetings as required (dates for these meetings are outlined in Annex 2).
6 Submit the **final review** following public consultation, by 31 July 2013

Review 3

At the completion of this process the review team will:

7 Submit a **1st draft of the review** to the NICE Team by 4 May 2012
8 Undertake any amendments to the draft following NICE comments and provide a revised draft (**2nd draft**) by 28 May 2012
9 Present the review findings to the PDG meeting on 13 June 2012
10 Undertake any amendments to the reviews following comment from the PDG and summit a **3rd draft by** 25 June 2012
11 Provision of written contributions and technical support during and after the completion of the reviews, as required during the development of the public health programme guidance. This will include:
   - Supporting the NICE Team in responding to any stakeholder comments on the reviews during the consultation on the evidence and draft guidance (consultation is currently planned for April to July 2013).
   - Attendance at PDG meetings as required (dates for these meetings are outlined in Annex 2).
12 Submit the **final review** following public consultation, by 31 July 2013

Background

Hospitalisation provides a unique opportunity for people to stop smoking. Smokers who are admitted to hospital are often highly motivated to quit and the hospital setting provides a potentially supportive environment to do so. Hospitals are smokefree environments and admission brings people into direct contact with healthcare professionals who can advise on giving up smoking and offer evidence-based treatment.

Smoking cessation counselling delivered in an acute hospital setting, combined with follow-up support on discharge, seems to increase smoking cessation rates[11]. There are also data from systematic reviews to show that intensive smoking cessation interventions provided to pregnant women who smoke and delivered to people

awaiting surgery can be effective in increasing long-term cessation rates.[1](Lumley et al., 2009; Moller & Villebro, 2009) However, this opportunity is often missed. Abstaining from smoking often results in a tobacco withdrawal syndrome (TWS) that comprises of a number of changes such as mood alterations, physical symptoms and signs, as well as biochemical and physiological changes.[1](Hughes, 2007) Not all smokers who are hospitalised will experience TWS but for those who do these symptoms can be managed. Current pharmacotherapies for smoking cessation, in particular fast acting nicotine replacement therapy (NRT) products, can be effective in alleviating tobacco withdrawal symptoms[1(West & Shiffman, 2001)] and could be offered to assist patients to abstain during their hospital stay.

There seems to be a number of barriers to providing help to smokers in secondary care. For instance there is a widespread concern that stopping smoking shortly before surgery may have negative effects on surgery outcomes, hospital electronic records are often inflexible and make recording of patient smoking status difficult, staff do not see addressing smoking as a part of their core duties,. There is a need to systematically review not just the efficacy of stop smoking interventions, which are usually evaluated in a somewhat rarified research setting but also the barriers and facilitators of stop smoking activities in acute and maternity settings. There is a scope to systematically increase referrals and access to smoking cessation services across both acute and maternity hospital settings, which such a review could facilitate.

Aim

The review aims to address the research questions set out below.

Scope

Groups that will be covered

The review will include evidence from smokers of all ages who use acute and maternity services, including those who are in the process of being referred to hospital and those who have recently been discharged. The review will all also capture:

- People who live in the same household as someone who is using acute and maternity services, such as partners, parents and other family members and carers
- visitors to acute and maternity care settings

- staff working in acute or maternity care settings, in particular, those who have direct contact with people using the services (this includes support staff, volunteers, those working for agencies or as locums and people employed by contractors)

This review will not consider the following populations:

- users of primary care services;
- users of mental health services; and
- staff working in, and visitors to, secondary care mental health settings.

Activities / interventions that will be covered

This review will address the effectiveness and barriers and facilitators of smoking cessation interventions in acute and maternity services. This will include:

- Interventions that help the populations of interest stop smoking
- Interventions that help populations of interest temporarily abstain

Activities / interventions that will not be covered

This review will not consider evidence relating to cut down to quit programmes in acute and maternity care settings. It will also not consider evidence relating to interventions aimed at staff to improve identification and referral of smokers.

These reviews will not consider evidence relating to smoking cessation and temporary abstinence interventions in users of primary care services, mental health services and staff working in, and visitors to, secondary care mental health services.

PICO table to summarise the review scope
Population
The review will include evidence from smokers of all ages who use acute and maternity services, including those who are in the process of being referred to hospital and those who have recently been discharged. The review will all also capture any literature on: • People who live in the same household as someone who is using acute and maternity services, such as partners, parents and other family members and carers • visitors to acute and maternity care settings • staff working in acute or maternity care settings, in particular, those who have direct contact with people using the services (this includes support staff, volunteers, those working for agencies or as locums and

people employed by contractors)

Intervention/Activity

This review will address the effectiveness and barriers and facilitators of smoking cessation interventions in acute and maternity services. This will include

- Interventions that help people stop smoking
- Interventions that help people temporarily abstain

Comparison

Data comparing pharmacological interventions with placebo or control procedures including no intervention, usual practice, or which compares two or more intervention types.

Data comparing behavioural interventions including face-to-face, self-help, telephone and internet interventions with control procedures

Data comparing other treatments (e.g. alternative medicine) with control procedures

The above comparisons will cover all studies concerning smoking cessation and temporary abstinence.

Data providing information on barriers and facilitators to smoking cessation in hospital and maternity service settings

Outcomes

Review 2

The following factors and outcomes will be considered in review 2:

- the effectiveness of smoking cessation interventions in acute and maternity service settings
- the effectiveness of temporary abstinence interventions in acute and maternity service settings

The key outcomes will include Russell Standard abstinence rates (continuous validated long-term abstinence rates based on ITT analysis). Where such strict outcomes are not available, other measures of outcome will be taken into account (e.g. point-prevalence short term un-validated abstinence rates). Other outcomes will include use and uptake of stop-smoking services and medications, and adverse events.

Review 3

The following factors and outcomes will be considered in review 3:

- How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation in terms of post-discharge care, sharing information on patients smoking status, advice and help provided, treatment outcomes, and in using referral pathways to specialist treatment?
- What barriers and facilitators affect the delivery of effective interventions identified in review 2 from multiple perspectives?

Research questions

This review will attempt to answer the following six questions:

Question 1: How effective are smoking cessation interventions in helping people from the populations of interest?

Question 2: How effective are interventions for temporary abstinence in helping people from the populations of interest?

Question 3: How effective are the current approaches used by maternity care services to identify and refer smokers to stop-smoking services?

Question 4: How effective are the current approaches used by maternity care services to provide smokers with smoking cessation information, advice and support?

Question 5: How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation?

Question 6: What barriers and facilitators affect the delivery of effective interventions?

Literature search protocol

Aims

The aim of the literature search is to identify evidence on the effectiveness and barriers and facilitators of smoking cessation interventions in acute and maternity services in the population of interest (see section 4.1 for further details).

Search approach

Review 2

This review will use a systematic approach to identify literature of the highest quality available that provides information on:

a) the effectiveness of smoking cessation interventions in acute and maternity service settings

b) the effectiveness of temporary abstinence interventions in acute and maternity service settings

c) the effectiveness of current approaches used by maternity care services to identify and refer people to stop-smoking services, for example provided by public or private providers

d) the effectiveness of current approaches used by maternity care services to identify and provide smoking cessation information, advice and support, for example by a nurse or physician

e) the effective approaches to encourage maternity care professionals to record smoking status and refer to stop-smoking services

The review will also focus on literature that provides information on:

- how the effectiveness of interventions vary between different service users (including their family or people they live with), visitors and people that work in acute and maternity services and if they are more effective in combination
- deliverer, setting, timing, frequency duration and severity of dependence has on the impact and effectiveness of the intervention
- adverse events reported from smoking cessation and temporary abstinence interventions

Review 3

This review will use a systematic approach to identify literature that provides information on:

1. How can community, primary, acute and maternity care providers collaborate more effectively to provide joined up services for smoking cessation, cessation in terms of sharing information on patient smoking status, advice and help provided, treatment outcomes, and in using referral pathways to specialist treatment?

2. What barriers and facilitators affect the delivery of effective interventions, for example the interventions identified in review 2?

The review will also focus on literature that provides information on:

- the views (knowledge, attitude, beliefs) of different population groups and service providers
- deliverer, setting, timing, frequency duration and severity of dependence has on the acceptability of the intervention
- adverse events reported from smoking cessation and temporary abstinence interventions

These reviews will not consider evidence relating to smoking cessation and temporary abstinence interventions in users of primary care services, mental health services and staff working in, and visitors to, secondary care mental health services. If a study concerns both primary and secondary care, evidence relevant to the search questions would be included.

Search questions

1: How effective are smoking cessation interventions in helping people from the populations of interest?

2: How effective are interventions for temporary abstinence in helping people from the populations of interest?

3: How effective are the current approaches used by maternity care services to identify and refer smokers to stop-smoking services?

4: How effective are the current approaches used by maternity care services to provide smokers with smoking cessation information, advice and support?

5: What are the barriers and facilitators to Joined up working / collaboration within or across settings, for example between primary and secondary care?

6: What barriers and facilitators affect the delivery of effective interventions?

Developing the search strategy

The main search strategy has been developed to capture the following:

(1) Review population and setting

The following search terms will be used

Patient admission/; hospitalization/; outpatients/ inpatients/; child, hospitalized/; adolescent, hospitalized/; Pregnant women/; patients/; patient#; (pregnant NS teens; teenager#; adolescent#; women; mothers); inpatient#, outpatient#; “out patients” inhospital; (day N2 patient#); ill patients; acutely ill; primip*; primigravid*; (patient# N2 surgery; operation; discharge#; readmission#; postdischarge#; emergency; emergencies; refer; refers; referral; referring; admit; admittance#; admitting; admission#; readmittance; readmitting; readmission#; postoperable; postoperative; admit; admits); maternity; maternal health; obstetrics; prenatal care; (“prenantal; antenatal; perinatal; obstetric; maternal AND service; services; clinic; clinics; health; healthcare”); hospitalised; hospitalized; secondary care; acute care; secondary health service; secondary health services; acute health service; acute health services; acute setting; acute settings; acute service; acute services; (acute; general; stay; staying W2 ward; wards); (accident; emergency; surgical; surgery; acute W unit; department); hospitals; hospital; (patient# N2 “post discharge”; maternal health services/; obstetric and gynecology department, hospital/; obstetrics/; hospitals+/; hospital units/; outpatient clinics, hospital/; emergency service, hospital; emergency medical services/; hospital staff/personnel/ W1 worker#; surgeon#; gyne#cologist#; obstetrician#; midwiv#; midwife; doctor#; nurse#; physician#; clinician#; pharmacist#; health W1 worker#; consultant#; medical W1 specialist#; medical W1 officer#

(2) Tobacco use

Tobacco use cessation/; Tobacco use disorder/; Tobacco, smokeless/; Smoking cessation/; Smoking/; Tobacco/; Tobacco; cigar*; "hand-roll"; handroll*; "hand-rolls"; "hand-rolled"; bidi; bidis; beedi; beedis; rolie; rolies; paan; gutkha; snuff; betel; cigar; cigars

(3) Smoking cessation

quit*; abstain*; abstinence; reduction; restrict*; reduce; cessation; (smoking; smoker#; tobacco; cigarette; cigarettes N2 quit; quitting; quitted; abstain; abstinence; reduction; reduces; reduce; abstaining); (tobacco; smoking; ADJ control); smoking services; smoking service; anti smoking; anti tobacco; temporary abstinence; (quit, abstain, abstinence, reduction, reduce, abstaining, ADJ2 tobacco, smoking, cigarette); (smoking, tobacco, cigarette#, smoker# N2 prevent; prevention; preventing; prevents; restrict#; restrict; restriction; restricted; restricts; restricting).

(4) Collaborative working

The following terms will be used to capture relevant literature on collaborative and joined up working in acute and maternity settings:

partnership# ; "team work" ; "teamwork"; teamworking; "team working”; cooperation; (cooperative W1 behavio#r); "integration"; "integrative approach"; "integrative approaches"; collaborat*; interagenc*; multiagenc*; "inter-institutional"; "inter-

institutionally"; "inter-professional"; "inter-departmental"; "inter-departmentally"; interinstitutional*; interprofessional; interdepartmental*; "interprofessional relations"; "interprofessional relationships"; (multidisciplin*); "cross discipline"; "cross disciplinary"; (interagency); linkage#; "cross-discipline"; "cross-disciplinary".

Search strategy

The search strategy for Medline is shown in Appendix 1.

A systematic search of the grey literature will not be undertaken but hand searching of bibliographies of systematic reviews the meet the inclusion criteria will be carried out to ensure that relevant data are included in this review.

To supplement the search for evidence NICE may issue a call for evidence from registered stakeholders. Relevant evidence will be included in this review

Equality and Diversity

The search strategy will be inclusive and aims to capture a broad range of evidence across all ethnic and disadvantaged groups.

Electronic resources

Databases

The following list includes the electronic databases that will be searched

- AMED (Allied and Complementary Medicine)
- ASSIA (Applied Social Science Index and Abstracts)
- British Nursing Index
- CINAHL (Cumulative Index of Nursing and Allied Health Literature)
- Cochrane Central Register of Controlled Trials
- Cochrane Database of Systematic Reviews
- Database of Abstracts of Reviews of Effectiveness (DARE; 'other reviews' and Health Technology Assesment (HTA) database in CRD database)
- Current Contents
- EMBASE
- EPPI Centre TRoPHI
- HMIC (or King's Fund catalogue and DH data)
- Medline
- UK Clinical Research Network Portfolio Database
- PsycINFO
- Sociological Abstracts
- Social Policy and Practice

Review 3: Barriers & facilitators for smoking cessation interventions in acute & maternity services

- Web of Knowledge (Science and Social Science Citation Indexes)
- CDC Smoking & Health Resource Library database
- Specialist (public health) systematic review registers
    - EPPI Centre DoPHER
    - Health Evidence ca

Websites

A minimum of 10 Internet sites will be searched from the following:

- Smoke free http://smokefree.nhs.uk
- NHS Centre for Smoking Cessation and Training http://www.ncsct.co.uk/,
- Action on Smoking and Health (ASH) http://www.ash.org.uk
- Treat tobacco.net http://www.treatobacco.net/en/index.php
- Society for Research on Nicotine and Tobacco http://www.srnt.org
- International Union against Cancer http://www.uicc.org
- WHO Tobacco Free Initiative (TIF) http://www.who.int/tobacco/en
- International Tobacco Control Policy Evaluation Project http://www.itcproject.org
- Tobacco Harm Reduction http://www.tobaccoharmreduction.org/index.htm
- Current controlled trials www.controlled-trials.com
- Association for the treatment of tobacco use and dependence (ATTUD) www.attud.org
- National Institute on drug abuse- the science of drug abuse and addiction http://www.nida.nih.gov/nidahome.html
- NICE
- Public health observatories
- Scottish Government
- Welsh Assembly Government
- NHS Evidence
- Joseph Rowntree Foundation
- The Centre for Tobacco Control Research (University of Stirling)
- UK Centre for Tobacco Control Studies
- Tobacco Control Research Group (University of Bath)
- http://www.controlled–trials.com

Restrictions

The following inclusion and exclusion criteria will be applied to the searches.

Inclusion Criteria

The following will be included:

Review 2:

- Systematic reviews

Review 3: Barriers & facilitators for smoking cessation interventions in acute & maternity services

- Controlled studies published from 1990 to the most recent available at the time of the search

Review 3:

- All relevant experimental, observational and qualitative studies
- Descriptive reports

Exclusion Criteria

The following will be excluded:

- Animal studies
- Studies that do not primarily address the review questions; and
- Studies not published in English

Gathering the evidence.

The search strategy will be translated for use, and then run on each of the various databases and websites.

Documenting the search process

At the completing of searching each database the following steps will be undertaken:

1. Results from the database searches will be downloaded into 'Endnote'. Items which cannot be downloaded into bibliographic software will be recorded in a Word document
2. A word document containing the search strategies for each resource searched will be created. Each strategy will include audit information, as shown in appendix 2.
3. A final de-duplicated 'Reference manager database'.

Reference details for any studies which may be of relevance to the contractors who will be undertaking, component 2 (Mental Health reviews), component 3 (smokefree reviews) component 4 (Cost effectiveness review and economic analysis) or component 5 (nicotine review) will be recorded in EndNote and provided to the NICE Team to pass these files onto the relevant contractors.

Reviewing the evidence

Reviewing of the scientific evidence will involve the following five steps:

1) Select the relevant evidence.

2) Assess its quality.
3) Extract, synthesise and present it.
4) Derive evidence statements.
5) Assess its applicability.

Studies will be selected on the basis of relevance to the scope of this review and consideration will given to:

- Relevance to the PICO table described above
- The hierarchy of evidence
- Availability of evidence – if high quality evidence is not available then we will use the best available evidence.

Selecting the relevant evidence

Title/ abstract screening

All titles and abstracts obtained from the search will be independently screened by members of our Project Team; using a screening checklist (a sample screening checklist is outlined in Appendix 3). Where there is disagreement the full paper will be obtained and resolved by discussion. .

The following studies will be considered:

- Quantitative studies (both experimental and observational studies);
- Qualitative studies;
- Systematic reviews; and
- Information that addresses the review questions.

Full-paper screening

Full papers will be obtained for those abstracts that meet the criteria for inclusion and will be independently screened for inclusion by members of the project team. Any disagreement will be resolved via discussion. The composite inter-rater reliability scores will be reported and the selection process will be summarised in a flow diagram. Each study excluded at the full-paper screening stage will be listed in the appendix of the review, along with the reason for its exclusion.

Assessment of study quality

The internal and external validity of studies will be assessed using quality appraisal checklists provided in appendix 4.

Each paper will be graded using the rating scale summarised below. Quality of this process will be assessed by appraising 10% of papers by a second appraiser to check accuracy. Any disagreement will be resolved by a third appraiser. The composite inter-rater reliability scores will be reported. This approach was utilised in previous NICE systematic reviews completed by members of this review team.(McRobbie, Hajek, Bullen, & Feigen, 2006; Myers, West, & Hajek, 2009)

Internal validity

The review team will use the checklists to ascertain if potential sources of bias have been minimised and to determine if its conclusions are open to any degree of doubt. Each study should be rated ('++', '+' or '-') to indicate its quality, where:

- ++ All or most of the checklist criteria have been fulfilled; where they have not been fulfilled the conclusions are very unlikely to alter.
- + Some of the checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter.
- – Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

The reasons for the quality rating will be documented in the appraisal checklist.

External validity

The external validity of studies will be assessed by determining the extent to which the findings for the study population are generalisable to the whole 'source population'. A rating of EV++, EV+, or EV- will be applied to indicate the degree of quality.

Data extraction and synthesis

Data extraction

A narrative summary and evidence table will be completed for each selected study. Data will be extracted into the evidence tables and will document data regarding the:

population; intervention (e.g. use of nicotine replacement products); and outcomes. The template that will be used for the evidence table is shown in Appendix 6, and is based on the recommendations of the NICE CPHE Methods Manual.[16] For quantitative studies exact p-values (whether or not significant) and confidence Intervals, where available, will be reported. Separate evidence tables will be produced to summarise the evidence related to each review question.

For qualitative data, analysis of the themes will be presented in the evidence tables along with a brief narrative of the paper – See Appendix 7.

Data synthesis

Findings from the review will be grouped into sections that will answer each review question. Subsections will be created to summarise data related to particular sub-topics. Evidence statements will be provided for each subsection.

Where data allows, meta-analyses will be undertaken.

Qualitative data will be themed and summarised. The main topics are likely to concern setting up systems for identification and referral of pregnant smokers, setting up systems for treatment in both pregnancy and secondary care, and issues concerning follow-up/post discharge care.

Meta-analyses

Meta-analyses will be conducted using RevMan software. A fixed effect model will be used, except in situations where there is statistical heterogeneity where a random effects model will be used. Forest plots will be presented for all meta-analyses.

Narrative summaries

The key findings of evidence will be summarised in concise narrative summaries that relate to particular sub-topics.

Evidence statments

The proposed evidence statements to be used in this evidence review will follow NICE recommendations. Statements will contain a descriptor, strength, and direction (positive or negative) of the evidence. Quality ratings of studies will be

used to formulate the strength. The overall strength will be summarised using the following:

- No evidence
- Weak evidence
- Moderate evidence
- Strong evidence

Evidence statements will also be developed from qualitative data. These will summarise the quality, context and key findings, and state the degree of concurrence between studies.

Applicability statements

The degree of applicability of the evidence, summarised in each evidence statement in this review, to the UK setting will be assessed. For each study included the reviewers will assess characteristics of the population, setting, intervention and outcomes studied. An applicability statement, showing the applicability of the evidence to the UK setting will be formulated and presented after each evidence statement using the following terms:

- directly applicable
- partially applicable
- not applicable.

Issues related to Inequalities

Any issues related to inequalities that appear in the literature will be flagged and summarised in a separate section of the final report.

References

Hughes, J. R. (2007). Effects of abstinence from tobacco: valid symptoms and time course. *Nicotine Tob Res, 9*(3), 315-327.

Lumley, J., Chamberlain, C., Dowswell, T., Oliver, S., Oakley, L., & Watson, L. (2009). Interventions for promoting smoking cessation during pregnancy. *Cochrane Database Syst Rev*(3), CD001055.

McRobbie, H., Hajek, P., Bullen, C., & Feigen, V. (2006). Rapid review of non-NHS treatments for smoking cessation Retrieved 6 Oct 2011

http://www.nice.org.uk/nicemedia/pdf/SmokingCessationNon-NHSFullReview.pdf

Moller, A., & Villebro, N. (2009). Interventions for preoperative smoking cessation. *Cochrane Database Syst Rev*(3).

Myers, K., West, O., & Hajek, P. (2009). A rapid review of interventions to prevent relapse in pregnant ex-smokers: A report to the National Institute for Health and Clinical Excellence. London.

Pollak, I., & Mullen, P. D. (1997). An exploration of the effects of partner smoking, type of social support, and stress on postpartum smoking in married women who stopped smoking during pregnancy. *Psychology of Addictive Behaviors, 11*(3), 182-189.

Walsh, R., & Redman, S. (1993). Smoking cessation in pregnancy: Do effective programmes exist? *Health Promotion International, 8*(2), 111-127.

West, R., & Shiffman, S. (2001). Effect of oral nicotine dosing forms on cigarette withdrawal symptoms and craving: a systematic review. *Psychopharmacology (Berl), 155*(2), 115-122.

Review 3: Barriers & facilitators for smoking cessation interventions in acute & maternity services

Search strategy for Medline

Smoking cessation in acute and maternity services: one review of effectiveness and one review of barriers and facilitators

Platform: EBSCO

Search conducted by C. Stansfield on 4 January 2011

Results: 6634

#	Query	Results
S1	MH ("TOBACCO USE CESSATION+")	18854
S2	(MH "Smoking Cessation")	16197
S3	(MH "Smoking/PC")	13139
S4	TI ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)	1331
S5	AB ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)	2629
S6	TI (quit* OR abstain* OR abstinence OR reduction OR restrict* OR reduce OR cessation)	119903
S7	AB (quit* OR abstain* OR abstinence OR reduction OR restrict* OR reduce OR cessation)	1167034
S8	TI ((stop N2 smoking) OR (stopping N2 smoking) OR (stopped N2 smoking) OR (stoppage N2 smoking))	526
S9	TI ((stop N2 cigarette) OR (stopping N2 cigarette) OR (stopped N2 cigarette) OR (stoppage N2 cigarette))	6
S10	AB ((stop N2 cigarette) OR (stopping N2 cigarette) OR (stopped N2 cigarette) OR (stoppage N2 cigarette))	63
S11	TI ((stop N2 cigarettes) OR (stopping N2 cigarettes) OR (stopped N2 cigarettes) OR (stoppage N2 cigarettes))	4
S12	AB ((stop N2 cigarettes) OR (stopping N2 cigarettes) OR (stopped N2 cigarettes) OR (stoppage N2 cigarettes))	39
S13	AB ((stop N2 tobacco) OR (stopping N2 tobacco) OR (stopped N2 tobacco)	106

	OR (stoppage N2 tobacco))	
S14	TI ((stop N2 tobacco) OR (stopping N2 tobacco) OR (stopped N2 tobacco) OR (stoppage N2 tobacco))	28
S15	TI ((smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))	531
S16	AB ((smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))	1348
S17	AB ((smoking N2 prevent) OR (smoking N2 prevention) OR (smoking N2 preventing) OR (smoking N2 prevents) OR (tobacco N2 prevent) OR (tobacco N2 prevention) OR (tobacco N2 preventing) OR (tobacco N2 prevents) OR (cigarette# N2 prevent) OR (cigarette# N2 prevention) OR (cigarette# N2 preventing) OR (cigarette# N2 prevents) OR (smoker# N2 restrict#) OR (smoker# N2 restriction) OR (smoker# N2 restricted) OR (cigarette# N2 restrict) OR (cigarette# N2 restricted) OR (cigarette# N2 restricts) OR (cigarette# N2 restricting) OR (cigarette# N2 restriction) OR (tobacco N2 restrict) OR (tobacco N2 restricted) OR (tobacco N2 restricts) OR (tobacco N2 restricting) OR (tobacco N2 restriction) OR (smoking N2 restrict) OR (smoking N2 restricted) OR (smoking N2 restricts) OR (smoking N2 restricting) OR (smoking N2 restriction)) OR TI ((smoking N2 prevent) OR (smoking N2 prevention) OR (smoking N2 preventing) OR (smoking N2 prevents) OR (tobacco N2 prevent) OR (tobacco N2 prevention) OR (tobacco N2 preventing) OR (tobacco N2 prevents) OR (cigarette# N2 prevent) OR (cigarette# N2 prevention) OR (cigarette# N2 preventing) OR (cigarette# N2 prevents) OR (smoker# N2 restrict#) OR (smoker# N2 restriction) OR (smoker# N2 restricted) OR (cigarette# N2 restrict) OR (cigarette# N2 restricted) OR (cigarette# N2 restricts) OR (cigarette# N2 restricting) OR (cigarette# N2 restriction) OR (tobacco N2 restrict) OR (tobacco N2 restricted) OR (tobacco N2 restricts) OR (tobacco N2 restricting) OR (tobacco N2 restriction) OR (smoking N2 restrict) OR (smoking N2 restricted) OR (smoking N2 restricts) OR (smoking N2 restricting) OR (smoking N2 restriction))	3480
S18	AB (temporary abstinence) OR TI (temporary abstinence)	34
S19	TI ((tobacco N2 quit) OR (tobacco N2 quitting) OR (tobacco N2 quitted) OR (tobacco N2 abstain) OR (tobacco N2 abstinence) OR (tobacco N2 reduction) OR (tobacco N2 reduces) OR (tobacco N2 reduce) OR (tobacco N2 abstaining))	269
S20	AB ((tobacco N2 quit) OR (tobacco N2 quitting) OR (tobacco N2 quitted) OR (tobacco N2 abstain) OR (tobacco N2 abstinence) OR (tobacco N2 reduction) OR (tobacco N2 reduces) OR (tobacco N2 reduce) OR (tobacco N2	1157

	abstaining))	
S21	TI ((smoking N2 quit) OR (smoking N2 quitting) OR (smoking N2 quitted) OR (smoking N2 abstain) OR (smoking N2 abstinence) OR (smoking N2 reduction) OR (smoking N2 reduces) OR (smoking N2 reduce) OR (smoking N2 abstaining))	1154
S22	AB ((smoking N2 quit) OR (smoking N2 quitting) OR (smoking N2 quitted) OR (smoking N2 abstain) OR (smoking N2 abstinence) OR (smoking N2 reduction) OR (smoking N2 reduces) OR (smoking N2 reduce) OR (smoking N2 abstaining))	6788
S23	TI ((cigarette N2 quit) OR (cigarette N2 quitting) OR (cigarette N2 quitted) OR (cigarette N2 abstain) OR (cigarette N2 abstinence) OR (cigarette N2 reduction) OR (cigarette N2 reduces) OR (cigarette N2 reduce) OR (cigarette N2 abstaining))	154
S24	AB ((cigarette N2 quit) OR (cigarette N2 quitting) OR (cigarette N2 quitted) OR (cigarette N2 abstain) OR (cigarette N2 abstinence) OR (cigarette N2 reduction) OR (cigarette N2 reduces) OR (cigarette N2 reduce) OR (cigarette N2 abstaining))	586
S25	TI ((cigarettes N2 quit) OR (cigarettes N2 quitting) OR (cigarettes N2 quitted) OR (cigarettes N2 abstain) OR (cigarettes N2 abstinence) OR (cigarettes N2 reduction) OR (cigarettes N2 reduces) OR (cigarettes N2 reduce) OR (cigarettes N2 abstaining))	30
S26	AB ((cigarettes N2 quit) OR (cigarettes N2 quitting) OR (cigarettes N2 quitted) OR (cigarettes N2 abstain) OR (cigarettes N2 abstinence) OR (cigarettes N2 reduction) OR (cigarettes N2 reduces) OR (cigarettes N2 reduce) OR (cigarettes N2 abstaining))	282
S27	TI ((smoking N2 cessation) OR (tobacco N2 cessation) OR (cigarettes N2 cessation) OR (cigarette N2 cessation))	6240
S28	AB ((smoking N2 cessation) OR (tobacco N2 cessation) OR (cigarettes N2 cessation) OR (cigarette N2 cessation))	12419
S29	TI ((smoker# N2 quit) OR (smoker# N2 quitting) OR (smoker# N2 quitted) OR (smoker# N2 abstain) OR (smoker# N2 abstaining) OR (smoker# N2 abstinence) OR (smoker# N2 reduction) OR (smoker# N2 reduce#) OR (smoker# N2 abstaining))	231
S30	AB ((smoker# N2 quit) OR (smoker# N2 quitting) OR (smoker# N2 quitted) OR (smoker# N2 abstain) OR (smoker# N2 abstaining) OR (smoker# N2 abstinence) OR (smoker# N2 reduction) OR (smoker# N2 reduce#) OR (smoker# N2 abstaining))	2118
S31	(S4 OR S5) AND (S6 OR S7)	530

S32	S1 or S2 or S3 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15 or S16 or S17 or S18 or S19 or S20 or S21 or S22 or S23 or S24 or S25 or S26 or S27 or S28 or S29 or S30 or S31	36889
S33	(MH "Patient Admission")	16145
S34	(MH "Hospitalization+")	133618
S35	(MH "Outpatients")	6928
S36	(MH "Inpatients")	10026
S37	(MH "Child, Hospitalized")	5455
S38	(MH "Adolescent, Hospitalized")	376
S39	(MH "Pregnant Women")	4529
S40	(MH "Patients")	14318
S41	TI (patient#)	1076780
S42	TI ((pregnant N3 teens) OR (pregnant N3 teenage#) OR (pregnant N3 teenager#) OR (pregnant N3 adolescent#) OR (pregnant N3 women) OR (pregnant N3 mothers))	13792
S43	AB ((pregnant N3 teens) OR (pregnant N3 teenage#) OR (pregnant N3 teenager#) OR (pregnant N3 adolescent#) OR (pregnant N3 women) OR (pregnant N3 mothers))	45618
S44	TI (inpatient# OR outpatient# OR "out patient" OR "out patients" OR "inhospital" OR (day N2 patient#) OR "ill patients" OR "acutely ill" OR primip* OR primigravid*)	40738
S45	AB (inpatient# OR outpatient# OR "out patient" OR "out patients" OR "inhospital" OR (day N2 patient#) OR "ill patients" OR "acutely ill" OR primip* OR primigravid*)	169326
S46	TI ((patient# N2 surgery) OR (patient# N2 operation) OR (patient# N2 discharge#) OR (patient# N2 readmission#) OR (patient# N2 postdischarge#) OR (patient# N2 emergency) OR (patient# N2 emergencies))	14963
S47	AB ((patient# N2 surgery) OR (patient# N2 operation) OR (patient# N2 discharge#) OR (patient# N2 readmission#) OR (patient# N2 postdischarge#) OR (patient# N2 emergency) OR (patient# N2 emergencies))	119288
S48	TI ((patient# N2 referral#) OR (patient# N2 referring) OR (patient# N2 admittance#) OR (patient# N2 admitting) OR (patient# N2 admission#) OR (patient# N2 readmittance) OR (patient# N2 readmitting) OR (patient# N2 readmission#) OR (patient# N2 postoperable) OR (patient# N2 postoperative) OR (patient# N2 refer) OR (patient# N2 refers) OR (patient# N2 admit) OR (patient# N2 admits))	4715

S49	AB ((patient# N2 referral#) OR (patient# N2 referring) OR (patient# N2 admittance#) OR (patient# N2 admitting) OR (patient# N2 admission#) OR (patient# N2 readmittance) OR (patient# N2 readmitting) OR (patient# N2 readmission#) OR (patient# N2 postoperable) OR (patient# N2 postoperative) OR (patient# N2 refer) OR (patient# N2 refers) OR (patient# N2 admit) OR (patient# N2 admits))	46690
S50	TI (maternity OR "maternal health" OR obstetrics OR "prenatal care" OR "prenatal services" OR "antenatal care" OR "antenatal services" OR "obstetric care" OR "obstetric services" OR "perinatal care" OR "prenatal clinic" OR "prenatal clinics" OR "prenatal health" OR "prenatal service" OR "antenatal clinic" OR "antenatal clinics" OR "antenatal service" OR "antenatal health" OR "obstetric clinic" OR "obstetric clinics" OR "obstetric service" OR "obstetric health" OR "perinatal clinic" OR "perinatal clinics" OR "perinatal service" OR "perinatal services" OR "perinatal health" OR pregnancy OR "maternity healthcare" OR "obstetric healthcare" OR "prenatal healthcare" OR "antenatal healthcare" OR "perinatal healthcare" OR "maternal care" OR "maternal service" OR "maternal services" OR hospitalised OR hospitalized OR "secondary care" OR "acute care" OR "secondary health service" OR "secondary health services" OR "acute health service" OR "acute health services" OR "acute setting" OR "acute settings" OR "acute service" OR "acute services")	157954
S51	AB (maternity OR "maternal health" OR obstetrics OR "prenatal care" OR "prenatal services" OR "antenatal care" OR "antenatal services" OR "obstetric care" OR "obstetric services" OR "perinatal care" OR "prenatal clinic" OR "prenatal clinics" OR "prenatal health" OR "prenatal service" OR "antenatal clinic" OR "antenatal clinics" OR "antenatal service" OR "antenatel health" OR "obstetric clinic" OR "obstetric clinics" OR "obstetric service" OR "obstetric health" OR "perinatal clinic" OR "perinatal clinics" OR "perinatal service" OR "perinatal services" OR "perinatal health" OR pregnancy OR "maternity healthcare" OR "obstetric healthcare" OR "prenatal healthcare" OR "antenatal healthcare" OR "perinatal healthcare" OR "maternal care" OR "maternal service" OR "maternal services" OR hospitalised OR hospitalized OR "secondary care" OR "acute care" OR "secondary health service" OR "secondary health services" OR "acute health service" OR "acute health services" OR "acute setting" OR "acute settings" OR "acute service" OR "acute services")	255290
S52	TI ((acute W2 ward) OR (acute W2 wards) OR (general W2 ward) OR (general W2 wards) OR (stay W2 ward) OR (staying W2 ward) OR (stay W2 wards) OR (staying W2 wards))	677
S53	AB ((acute W2 ward) OR (acute W2 wards) OR (general W2 ward) OR	2962

	(general W2 wards) OR (stay W2 ward) OR (staying W2 ward) OR (stay W2 wards) OR (staying W2 wards))	
S54	TI ((accident W3 unit) OR (accident W3 department) OR (emergency W1 unit) OR (emergency W1 department) OR (surgical W1 ward) OR (patient# N2 surgery) OR (surgery W2 unit) OR (surgery W2 department) OR (acute W2 unit) OR (acute W2 department))	23092
S55	AB ((accident W3 unit) OR (accident W3 department) OR (emergency W1 unit) OR (emergency W1 department) OR (patient# N2 surgery) OR (surgical W1 ward#) OR (surgery W2 unit) OR (surgery W2 department) OR (acute W2 unit) OR (acute W2 department))	108278
S56	TI (hospitals OR hospital OR (patient# N2 "post discharge"))	181415
S57	AB (hospitals OR hospital OR (patient# N2 "post discharge"))	493665
S58	(MH "Maternal Health Services+")	28351
S59	(MH "Obstetrics and Gynecology Department, Hospital")	2214
S60	(MH "Obstetrics")	14150
S61	(MH "Hospitals+")	180568
S62	(MH "Hospital Units+")	66597
S63	(MH "Outpatient Clinics, Hospital+")	14543
S64	(MH "Emergency Service, Hospital+")	40071
S65	(MH "Emergency Medical Services")	27584
S66	TI (("hospital staff") OR ("hospital personnel") OR (hospital W1 worker#) OR surgeon# OR gyne#cologist# OR obstetrician# OR midwiv* OR midwife)	25287
S67	AB (("hospital staff") OR ("hospital personnel") OR (hospital W1 worker#) OR surgeon# OR gyne#cologist# OR obstetrician# OR midwiv* OR midwife)	103541
S68	TI (hospital) OR AB (hospital)	533136
S69	TI (doctor# OR nurse# OR physician# OR clinician# OR pharmacist# OR health W1 worker# OR consultant# OR (medical W1 specialist#) OR (medical W1 officer#))	191646
S70	AB (doctor# OR nurse# OR physician# OR clinician# OR pharmacist# OR health W1 worker# OR consultant# OR (medical W1 specialist#) OR (medical W1 officer#))	412247
S71	S69 or S70	543647
S72	(S68 and S71)	67181
S73	AB (partnership# or "team work" or "teamwork" OR teamworking OR "team	261508

	working" or cooperation or (cooperative W1 behavio#r) or "integration" or "integrative approach" OR "integrative approaches" or collaborat* or interagenc* or multiagenc* or "inter-institutional" or "inter-institutionally" or "inter-professional" or "inter-departmental" or "inter-departmentally" or interinstitutional* or interprofessional or interdepartmental* or "interprofessional relations" or "interprofessional relationships" or (multidisciplin*) or "cross discipline" OR "cross disciplinary" or (interagency) OR linkage# OR "cross-discipline" OR "cross-disciplinary")	
S74	TI (partnership# or "team work" or "teamwork" OR teamworking OR "team working" or cooperation or (cooperative W1 behavio#r) or "integration" or "integrative approach" OR "integrative approaches" or collaborat* or interagenc* or multiagenc* or "inter-institutional" or "inter-institutionally" or "inter-professional" or "inter-departmental" or "inter-departmentally" or interinstitutional* or interprofessional or interdepartmental* or "interprofessional relations" or "interprofessional relationships" or (multidisciplin*) or "cross discipline" OR "cross disciplinary" or (interagency) OR linkage# OR "cross-discipline" OR "cross-disciplinary")	71666
S75	(S33 or S34 or S35 or S36 or S37 or S38 or S39 or S40 or S41 or S42 or S43 or S44 or S45 or S46 or S47 OR S48 OR S49 OR S50 OR S51 OR S52 OR S53 or S54 or S55 or S56 or S57 or S58 or S59 or S60 or S61 or S62 or S63 or S64 or S65 or S66 or S67 or S68 or S72 or S73 or S74)	2614599
S76	S75 AND S32	7304
S77	MH ("Humans") AND MH ("Animals")	1253188
S78	MH ("Animals")	4777882
S79	S78 NOT S77	3524694
S80	S76 NOT S79	6634

Notes:

= wildcard of 1 or 0 characters

* = truncation

N2 = words within 2 places of each other in any order

W2 = words within 2 places of each other in the order written in the text

Appendix 2 – Summary of Studies Included in Chapter 1

The table below summarises the studies included in Chapter 1.

Author	Summary
Adriaanse 1991, Spain Study (Service audit)	A 200 bed hospital implemented a smoke-free policy, prevalence of staff smoking declined from 51% to 40% (S-2)
Adsit 2005, USA Study (Service audit)	Wisconsin training programme trained over 10,000 HCPs in 4 years. Over this time Health Plans covering smoking cessation medications increased from 56% in 2002 to 74 in 2004 and those covering behavioural intervention from 58% to 76% (S-1)
Al-alawy 2011, UK Study (Service audit)	269 hospital staff from Rotherham trained in smoking cessation brief intervention Rotherham, Over 13 months 890 smokers referred to treatment; 414 set TQD; 143 4-week quitters. Of 50 hospital smokers, 28 advised and 11 referred. UK experience, and implementation details (S-3)
Aziz 2009, UK Study (Meta-Analysis)	Meta-analysis of 11 studies, concluded that a combination of extended follow-up and medications is effective in smoking cessation (S-3)
Ballbe 2008, Spain Study (Pre-post)	66 HCP trained in brief intervention, training improved their skills, but not their practice. 170 patients pre-training and 170 post-training received similar care (Only abstract is in English) (S-2)
Batlle 1991 Spain Study (Survey)	Hospital wide programme to (1) to reduce tobacco consumption among hospital staff and (2) to create an awareness of their exemplary role as health professionals. In order to achieve these aims, different activities were carried out: lectures on the consequences of smoking; restrictions on smoking in hospital areas; and smoking cessation help for those who wished to give up smoking. Survey taken in 1986 (N=298) and 1989 (N=304). A change in attitudes among the health professionals was seen, especially with regard to their disposition to give advice to stop smoking. The results show a reduction of the prevalence of smoking among the hospital staff and a positive change in their attitudes towards smoking (S-1).

Barrera 2005, USA Study (Prospective)	Prospective study looking at post-operative pulmonary complication in patients undergoing thoracotomy for lung tumours. Not validated. Recent quitters defined as smoke free 1-2 weeks pre surgery. No significant difference in complications between the two groups (S-3)
Becker 1989 Study (Survey)	Smoke-free (S-1)
Bialous 2004, USA Study (Qualitative)	8 focus groups with current smoker or ex-smoker nurses. Current smokers feel guilty and want treatment (S-1)
Bickerstaffe 2008, UK Study (service audit)	A service audit of hospital based smoking cessation services (including pre-operative assessment). Aim of programme to identify smokers in secondary care and to provide a continuation of support post-discharge. Patient management system used, chart listing NRT details for level 2 staff, departmental agreement to receive brief training. Positive feedback from patients (S-3)
Bitton 2009 Discussion (Commentary)	Commentary on Smith et al. (2009). RCT - counselling should be extended post-discharge via quitlines (D-1)
Blake 2011, UK Study (Survey)	Smoking prevalence in pre-registration UK nurses is similar to their registered counterparts. (S-2)
Boyle 2011, USA Discussion	Protocol for Cochrane review to assess electronic medical records-facilitated interventions – EMRs prompts to AAAA (D-1)
Bryant 2008, USA Study (Pre-post)	49 nurses received smoking cessation training. Post-training more felt they knew how to assess patients, document smoking, and 'knew the strategies' (S-1)
Carson 2012 (previously Lancaster 2000), UK Discussion	17 RCTs that focussed on training HCPs in smoking cessation (in range of activities training that included single session counselling, follow-up, NRT, self-help). Training intensity ranged from 40 minutes to 4-5 days. Only two studies included hospital physicians. Training had a significant effect on smoking

(Systematic review)	cessation and professional practice. (D-3)
Chan 2006 Study (Retrospective)	Retrospective study looking at post-operative wound complications in patients undergoing bilateral breast reduction. Not validated. Recent quitters defined as smoke free less than 4 weeks before surgery. No significant difference in complications between the two groups (S-3)
Chan 2011, Malaysia Study (Survey)	Questionnaire administered to 267 paediatric ward nurses, 2% smoke, 66% do not document parent's smoking status, ½ not aware of any smokers clinics, training needed (S-1)
Chang 1995. USA Study (Pre-post)	Pulmonary physicians, chart reminders (bright stickers) improved recording of smoking stats from 33% to 83%, counselling 6-12%. Once identified, smokers almost always advised (S-3)
Cohen 1989, USA Study (RCT)	Physicians and their panel of patients were randomised to either training (advice, QD, FU check), Training and prompt (chart reminder), training and provision of NRT to patient or training, prompt and NRT. Training lasted 1 hour. PP at 12 months and CO validated. Prompted doctors were more likely to advise to quit (66% vs. 27%) and ask to set a QD (14% vs. 3%). 12 month quit rates were significantly higher for the prompted groups (7.9% vs. 1.5%) (S-3)
Cornuz 2002, Switzerland Study (RCT)	RCT looking at the efficacy of training residents in smoking cessation counselling (2.5 days training) on change in practice and abstinence rates. 1 year PP significantly increased in the intervention group (13% vs. 5%) (S-3)
Foland 2000, USA Discussion	MULTIFIT cardiac rehab program that included a component on smoking: physician advice, nurse counselling session, and telephone FU. 50%-60% quitters at 1 year (Seems similar to no-treatment rates) (D-2)
Freund 2009a, Australia Study (RCT)	Four hospitals quasi-randomised. The intervention group (broad strategy involving: linking to existing practice; training; prompts and reminders; monitoring; management support): was more likely to prescribe NRT (16% vs. 4%), give out self-help booklets (11% vs. 2%), record of session (13 vs. 3). More patients than staff reported interventions (S-3)

Freund, 2009b, Australia Study (Meta-analysis)	Meta analysis of effectiveness of interventions to increase smoking cessation care provision in hospitals. Included 25 studies but many lacked control arm and most included a multi-pronged approach. There was a 17% increase in the proportion of patients that were assisted to quit in the intervention vs. control groups (pooled risk difference = 16.6 95% CI: 4.9-28.3). There was no significant effect on assessment of smoking status, advice to quit or offer of NRT (S-3)
Garret-Symanski 2005, USA Study (Service audit)	421 smokers were seen by an inpatient smoking cessation counsellor, 129 contacted 1-6M later, 68 abstinent. (conference abstract) (S-1)
Garrett-Szymanski 2006, USA Study (Service audit)	Nurse-managers compiled daily roster –identified only ¼ of smokers (compared to room-by-room assessment by nursing students). A smoking query as mandatory field on hospitals electronic admission screen, got 90%. (S-3)
Geller 2011, USA Study (Survey)	888 paediatric nurses surveyed. 43% asked about household smokers, 25% advised to quit, 6% assisted with quit plan. 3% arranged FU. Asked if hospital admission assessment included it (S-2)
Glassman 2000, USA Study (Retrospective)	Retrospective study looking at post-operative wound complications in patients undergoing posterior instrumental infusion. Not validated. Recent quitters defined as smoke free up to 1 month before surgery. No significant difference in complications between the two groups (S-3)
Goldstein 1999, USA Discussion (Commentary)	Comment on Rigotti et al. 1999, NRT in hospitals underused, barriers: absence on inpatient formulary, lack of chart reminders, staff training (D-2)
Gomm 2002, Australia Study (Survey)	127 nurses completed a questionnaire. Most not confident about assisting patients to quit, though ⅔ thought it within their role (S-2)
Good 2004, USA	Nurses working in primary care were mailed a questionnaire. 51% reported documenting patients tobacco use, 35% provided

Study (Survey)	brief advice and 23% recommended NRT. Barriers were disinterested patients, little time, skills and knowledge. Nurses with advance nursing qualifications were more likely to feel confident about their smoking compared to those with less education (S-3)
Gosselin 2011, USA Study (RCT)	Quazi-experimental; 1 hour staff training on smoking cessation counselling and pharmacotherapy given, 112 patients contacted at 1M. Results found more patients of trained nurses reported asked, advised, prescribed, and FU. No effect on quit attempts or quit rates (S-2)
Groth 2009, USA Study (Retrospective)	Retrospective study looking at all post-operative complications in patients undergoing pulmonary resection. Not validated. Recent quitters defined as smoke free up to 1 month before surgery. No significant difference in complications between the groups (S-3)
Haile 2002, Australia Study (Pilot)	Examined the effect of a computerised screening and counselling tool in 234 patients attending a surgical preadmission clinic. Tool detected 56 smokers who went on to complete the interactive tailored (based on stage of change) cessation component. 37 could be contacted at 9 months and 22 reported stopping smoking prior to surgery. It was low cost (AUD 10,000 to develop) and highly acceptable (S-2)
Hawkshaw 2005, Australia Study (Service audit)	Audit of NRT use. Results show that whilst 80% of records had information about smoking status, few (6.3%) had evidence that NRT was provided. Most patients who were prescribed NRT were also given a prescription for more on discharge. Cite lack of knowledge and systems as barriers (S-2)
Heath 2007, USA Study (Survey)	Pre-post (12 months apart) survey to examine the effect of a 2-day training the trainer programme to increase smoking cessation knowledge of nurse educators. Training increased the proportion of nurse educators who dedicated at least 3 hours to tobacco education in their classes (22.2% to 74.1%, $p<0.01$) (S-2)
Hill 2008, UK Study (Pre-post)	Pre-post intervention (intensive training on smoking cessation delivered to nurses on respiratory, cardiology, and endocrinology wards). Training improved screening and provision of advice (pre: 31% and post: 88% of smokers received smoking cessation advice). (S-3)

Hodgson 2011, UK Study (Service audit)	Audit of 118 consecutive medical patients showed that only 1/25 current smokers' received advice. An educational programme was introduced as well as several foundation trainees were employed as smoking champions. Following this intervention documentation of smoking history increased from 0% to 68%. Prior to intervention 7 smokers on the respiratory ward were referred to treatment over a 6-month period. Post intervention this increased to 77 patients. 82% of those referred to cessation services were abstinent at 4-weeks (S-3)
Hopkinson 2011, UK Study (Service audit)	Implementation of a COPD discharge care bundle that included an offer of smoking cessation (referral). Utilised training that was provided on the ward in a 'drop in' way. Significant increase in compliance with offering smoking cessation referral (18.2% to 100%), although 11/24 smokers declined the offer. There was also a downward trend in readmission rates, although not significant and cannot be attributed only to the smoking cessation training (S-3)
Houghton 2008, USA Study (Survey)	439 (response rate 44%) certified registered nurse anaesthetists surveyed regarding their smoking cessation practice and attitudes. Most report screening for tobacco use, and think that advice to quit is important but few actually do this. Fewer offer treatment. Barriers included lacked time, lack of training (S-2)
Hurt 1995, USA Study (Pre-post)	Pre-post study that showed that having a smoking cessation intervention study that was conducted in a drug and alcohol service changed beliefs of staff members (S-1)
Hussain 1993, Wales Study (Survey)	Measured smoking prevalence and attitudes towards smoking in hospital staff. 5% of doctors and 20% of nurses smoked. 38% of respondents favoured hospital-wide smoking ban, 90% favoured ban in wards and labs.40% of smokers wanted help to stop (S-1)
Hymowitz 2005, USA Study (Survey)	Baseline survey of 1770 parents/caregivers of sick children who were taking part in a doctor training intervention study. 20% of parents reported smoking but only 10% of smokers reported that the doctor offered help to quit, and 25% reported that they were offered advice on stopping second hand smoke exposure (S-2)
Kannegaard, 2005, Denmark Study (Survey)	Report on staff smoking prevalence and attitudes. Follow-up and comparison to 1999 (unpublished study). Staff smoking prevalence decreased from 33% in 1999 to 26% in 2001. Current smokers less likely to accept cessation help. Fewer

	concerned with passive smoke (S-1)
Katz 2008, USA Study (Survey)	Cross sectional survey of tobacco, alcohol, and drug use of patients (non-ICU) from two hospitals and their willingness to change. Prevalence of smoking was 70% in patients with at-risk drug and alcohol use compared to 24% in patients who did not use these substances. Most patients want to quit drug use (S-1)
Kloss 2011, USA Study (Service audit)	Brief training programme on how to provide smoking cessation counselling and referral was provided to ED doctors. Audit of hospital records 4-month pre- and post- training showed a significant increase in proportion of smokers counselled (1.4% to 4.5%, $p<0.001$) (S-3)
Koplan 2008, USA Study (Service audit)	Assessed the impact of adding a tobacco order template to the hospital admission system. Patients coded as 'smoker' prompted a drop-down menu of smoking cessation treatment and referral options. Audit of hospital records 4-month pre- and post- implementation of the tool showed that it was used in 42% of all admissions and resulted in a small but significant increase in the proportion of patients that were referred for counselling (0.8 – 2.1%) and had NRT charted (1.6 – 2.5%), $p<0.001$ for both changes (S-3)
Kotz 2008, Netherlands Study (Survey)	Survey of Dutch Respiratory Nurses' smoking cessation practice and attitudes before and after the introduction of a smoking cessation treatment protocol. In 2006, compared with 2000, nurses offered more intensive smoking cessation counselling to patients and 7/10 behaviour change techniques were being used by >94% of nurses. Low patient motivation was the most important perceived barrier for treatment (S-2)
Kuri 2005 Japan Study (RCT)	Retrospective study looking at post-operative wound complications in patients undergoing reconstructive head and neck surgery. Not validated. Recent quitters defined as smoke free up to 6 weeks before surgery. Beneficial effect seen in those who recently quit smoking compared to continuing to smoke (S-3)
Lancaster 2000, UK Discussion (Systematic	8 RCTs that focussed on training HCPs in smoking cessation (in range of activities training that included single session counselling, follow-up, NRT, self-help). Only one study included hospital physicians. Training had no effect on smoking cessation and professional practice. (D-3)

review)	
Lindstrom 2008 Sweden Study (RCT)	RCT looking at all post-operative complications in patients undergoing hernia repair, laparoscopic cholecystectomy, hip and knee replacement. CO validated. Recent quitters defined as smoke free up to 3 weeks before surgery. No significant difference in complications between the groups (S-3)
Liu 2010, USA Study (Service audit)	US hospital with poor recording of smoking status, group formed with executive director, 1-2 hour training sessions in 5As, motivational interviewing and referrals. Barriers: time to ask, do and record, recording too many things already at admission. Each ward allocated advisor; admission nurse only records status and readiness to change, advisors do the rest. Recording of smoking status and record of intervention improved to some 90%. Effect on cessation not known (S-3)
Longo 2001, USA Study (Service audit)	Compared employees in smoke-free hospitals with groups in non-smoke-free workplaces. Bans led to quitting (though smokers may have avoided second survey or misreport) (S-2)
Malek 2007, Australia Study (Survey)	An Australian hospital's records surveyed for 100 consecutive patients, 84 had status recorded, there were some recording and coding errors (S-1)
May 2008, Australia Study (Qualitative)	Acute cardiac care, NRT not used, 13 staff members interviewed on NRT. Barriers: Cost, safety, lack of knowledge. Also not on the formulary (S-2)
McCarty 2001, USA Study (Survey)	397 nurses filled in a questionnaire. 59% thought quit advice is their obligation. Attitudes correlated with self-reported practice (S-2)
McDaniel 1999, USA Study (Service audit)	Memos displayed on wards to prompt referrals – 1/29 referred; put in charts – 18/52 referred, when prompts removed, referral dropped again. Barriers to referring: did not remember, too busy, patient not interested, patient too sick (Paper does not show what the chart reminder looked like) (S-3)
Mochizuki 1996, UK	621 students completed a questionnaire, most thought they do not have authority to advise patients on smoking (years 1-5

Study (Survey)	included). 23% Males and 16% Females smoked (S-1)
Moller 2002, USA Study (RCT)	RCT looking at all post-operative complications in patients undergoing elective hip and knee alloplasty. CO validated. Recent quitters defined as smoke free up to 8 weeks before surgery. No significant difference in complications between the two groups (S-3)
Montner 1994, USA Study (Pre-post)	34 doctors had 2h training on health effects of smoking, counselling, and relapse prevention. Training improved self-reported attitudes, beliefs, knowledge and usual practice (evaluation items not included) (S-1)
Myers 2011, UK Study (Meta-analysis)	Nine RCTs looking at post-operative complications in continued and recently quit smokers (within 8 weeks of surgery). One study found a beneficial effect of recent quitting and none identified any detrimental effect (S-3)
Naudziunas 2005, Lithuania Study (Survey)	56 CVD patients answered a questionnaire regarding advice from their doctors. Results discussed with doctors. A subsequent cohort of patients (n=64) were surveyed, doctors now more often discussed smoking, diet, BP and cholesterol (S-2)
Nicholson 2000, USA Study (Survey)	Sticker prompts were introduced on charts in 4 hospitals. 682 patients answered a questionnaire and their charts reviewed. 71% said they were counselled, only 46% charts showed it (S-2)
O'Donovan 2009, Ireland Study (Qualitative)	430 nurses, 21% smoked. Psychiatric (47%) and coronary nurses (34%) smoked more. 14% trained in smoking cessation, lack of time and training barriers to giving advice (S-2)
Olive 1996, USA Study (Survey)	2,700 staff of 2 hospitals answered a questionnaire, only one reported smoking less at work, but 8-9% quit. Smoking bans in hospital may increase staff smoking (S-1)
Palonen 2006, USA Study (Survey)	70 doctors, 659 patient surveys and 761 chart reviews. Advice to quit was 66% in records but only 52% in patient surveys (discordance both ways in different studies) (S-2)
Passera 2010, New Zealand	Cardiac nurses in a hospital advise patients using ABC approach to smoking cessation (D-1)

Discussion	
Patient Education Management 2005, USA Discussion	Nurses who smoke feel awkward, take more breaks, and are less likely to intervene with smokers. 16% of nurses in US smoke (no reference for this) (D-2)
Power 1992, UK Study (Prospective)	60 outpatients received advice and CO feedback (N=40) or usual care (N=20), this had no effect. (S-1)
Prathiba 1998, UK Study (Prospective)	663 patients received intensive treatment, 12M validated quit rate 21%. Estimated quit rate with physician advice only – 7.5%, cost per life year saved circa £400. Good investment (S-2)
Reid 2010, Canada Study (Service audit)	Implementation of 5As monitored, 6M quit rate up from 18% to 29% (S-1)
Rigotti 1999, USA Study (Prospective)	Prospective observational study within a randomized smoking-intervention trial. Inpatient pharmacy records of nicotine patch or gum use (n=650). Only 34 of 650 smokers (5.2%) received NRT during their hospital stay. NRT was more likely to be prescribed to patients with nicotine withdrawal (OR 2.23; 95% CI: 1.01, 4.90), a higher daily cigarette consumption (OR 1.04; 95% CI: 1.01, 1.06), and a longer hospitalization (OR 1.05; 95% CI: 1.00, 1.10) (S-2).
Sarna 2001, USA Study (Survey)	Survey sent to 4,000 oncology nurses (1508 responded). A subsample of 858 nurses with ‘high’ or ‘low’ barriers to delivering smoking cessation. High barriers group were more likely to be never or current smokers. They were also more likely to have less confidence and feel that they are harming their relationship with patients. Low patient motivation was the most commonly cited barrier. Others included lack of skill and knowledge (S-1)

Schofield 1995, Australia Study (Prospective)	515 doctors from two hospitals. One hospital implemented a mail out of cessation advice to patients who were recorded as smokers, the other did not. Half of all doctors were surveyed pre-implementation and the other half post-implementation. Most (71%) doctors usually advise on the risks of smoking, less (21%) give advice to quit, and less refer to cessation services (5%) or prescribe NRT (1%). Doctors in the control hospital were more likely to report never giving advice on how to quit ($p<0.05$). Physicians were significantly more likely than surgeons to encourage patients to quit ($p<0.0001$). The mail out had no effect on advice from doctors (there was a concern that it might decrease the frequency at which doctors advise patients) (S-3)
Schofield 1999, Australia Study (Service audit)	Investigated accuracy of documentation of smoking status by administration staff. Only 63% of patients with urinary cotinine indicative of current smoking were actually recorded as a smoker by admin staff. However clinical staff usually corrected this. Relying on administrative staff to assess smoking status may not be ideal (S-3)
Segaar 2007, Netherlands Study (Survey)	Survey of 206 cardiology nurses to assess application of a smoking cessation protocol. 94 nurses did not fully apply the intervention outlined in the protocol. Most nurses (80%) assessed smoking status, 70% discussed reasons to quit, and 60% discussed options for quitting. The older and more experienced nurses were more likely to implement all steps. Lack of skills was cited as a common barrier. Having a smoking room on the ward also undermined efforts (S-3)
Slater 2006, UK Study (Survey)	HCPs who smoke less likely to engage in stop-smoking advice (S-2)
Stillman 1990, USA Study (Survey)	Smoke-free (S-1)
Thompson, 2006, USA Study (RCT)	45 smokers (in CCU or general medical unit) randomised to standard education; standard education + intensive inpatient intervention; the latter with additional monthly phone calls. All were offered NRT. Barriers were: low enrolment; a need for dedicated nurses to deliver the intervention; short hospital stays

	and patients leaving wards for other interventions meant that the intervention was difficult to deliver; inconsistent NRT prescribing. (S-2)
Thy 2007, Norway Study (Survey)	784 out of 1025 hospital doctors responded to a survey on helping their patients quit smoking. Lack of time, knowledge and skills were the most commonly cited barriers. 28% said that it was not their job to do this and 32% said that it was not worth the effort (S-2)
Uzuner 2008, USA Study (Service audit)	Investigated electronic tools for coding smoking status documented in discharge summaries. Showed that discharge summaries express smoking status in a limited number of ways and therefore should be easy for electronic tools to collect these data (S-3)
Vaughn 2002, USA Study (Survey)	Explored the relationship between organisation factors and doctors adherence to smoking cessation guidelines. 94% give advice to stop, 86% explain health risks, 57% refer patients to a cessation programme, 22% give written information, 16% write a prescription for NRT. Facilitators: leadership support, educational mechanisms, monitoring and feedback, better knowledge of guidelines. Barriers: time to intervene, restriction of smoking cessation medicines (S-2)
Vega 2010, NZ Study (Service audit)	Audit of NRT prescribing in hospital pre- and post training doctors. A 45-minute training session on how to prescribe NRT changed practice (a four fold increase in units of NRT prescribed) (S-3)
Vitavasiri 2010, Thailand Study (Survey)	Survey of hospitals following decision to have 100% smokefree hospitals. Facilitators included public display of non-smoking policy, arrangement of anti-smoking related activities, cessation services (staff cessation, identification of smokers, cessation clinics, research). Barriers: low support for policy, no penalty for smokers, low awareness of risks and treatment, lack of knowledge and skills of staff (S-2)
Vokes 2006, USA Study (Qualitative)	Descriptive analysis of audiotapes from 871 doctor-patient interactions in an emergency department. All patients were women and non-emergencies. 484 (56%) were screened for smoking, 56% of the 156 smokers were given advice to quit and

	13% were referred for treatment. Screening was more likely in urban compared to suburban centres and more likely to occur if the person was presenting with a smoking related disease (S-3)
Von Garnier 2008, Switzerland Study (Survey)	314 outpatients contacted by phone with 24 hours post-appointment. Asked about advice from doctors. 81% asked about smoking, 28% received advice on risks, 10% got advice to quit, and 9% offered help to quit (S-3)
Von Garnier 2010, Switzerland Study (Survey)	Following on from 2008 study. Showed an improvement on training doctors. Doctors received half day training on smoking cessation counselling (motivational interviewing and the 5As and 5Rs approach). 272 outpatients contacted by phone with 24 hours post-appointment. 82% asked, 46% received advice on risks, 32% got advice to quit, and 23% offered help to quit (S-3)
Walker 2009, UK Study (Prospective)	25 orthopaedic patients advised to quit, then recommended to see GP for further help, pre-operatively. 16 stopped pre-surgery. 12 not smoking at 1 year. Self-report (S-1)
Walsh 2007, USA Study (Survey)	36 doctors/students, post-training felt more likely to Ask, Advise, Assist, had some improved smoking cessation knowledge (S-1)
Wang 1994, Taiwan Study (RCT)	27 physicians randomised to receive one of 3 conditions: training (2 lessons), poster reminder to give advice, or usual care. Self reported abstinence at 6 months was significantly higher in the trained group (28.6% vs 4.3%). Combination of primary physicians and internists.(Residents and physicians in family medicine – setting not reported) (S-1)
Ward 2002, USA Study (Survey)	879 ambulatory care physicians filled out Q. 62% received no training on smoking cessation guidelines; 44% unfamiliar with them. 93% always/usually suggest smoking cessation; 57% always/usually refer to specialist service (usually at hospital); 16% felt smokers greatly/very greatly receptive to advice; 30% did FU's about ½ the time (S-1)
Ward 2002 USA Study (Survey)	Evaluated the effect of the AHCPR smoking cessation guideline on provider practices with smokers and on patient smoking rates. Patient survey and chart review data from 138 Veterans Administration (VA) acute care medical centres. There was a significant increase in the percentage of patients in the VA who

	were counselled about smoking and a significant decrease in the percentage of patients who smoke. (S-2)
Ward, 2003, USA Study (Survey)	Evaluated the effect of smoking cessation guidelines on practice via patient survey and audit of charts between 1996 and 1998. Chart audit showed a significant increase in screening of tobacco use (61%-95%; p=0.0001) and counselling (p<0001). Patient survey also showed that smokers were more likely to be counselled in 1998 (79%) than in 1996 (76%), p=0.0001 (S-3)
Warner 1984, USA Study (Retrospective)	Retrospective study looking at post-operative pulmonary complications in patients undergoing coronary artery bypass grafting (CABG). Not validated. Recent quitters defined as smoke free up to 8 weeks before surgery. No significant difference in complications between the two groups (S-3)
Warner 1989, USA Study (Retrospective)	Retrospective study looking at post-operative pulmonary complications in patients undergoing coronary artery bypass grafting (CABG). Urinary cotinine validated. Recent quitters defined as smoke free up to 8 weeks before surgery. No significant difference in complications between the two groups (S-3)
Warner 2004, USA Study (Survey)	328 anaesthesiologists (ANs), 299 surgeons (SGNs) surveyed. ~90% ANs and SGNs asked smoking status. 85% ANs and 40% SGN never/rarely provide help or refer. Barriers: interventions thought ineffective, time, lack of knowledge (S-2)
Warner 2008, USA Study (Qualitative)	19 surgical patients, 10 surgeons interviewed. Patients want more input from surgeons, knew little about quitlines but willing to call them. Most surgeons knew about quitlines, knew nothing else about them, but were willing to refer. Want max 30 mins training on them (S-2)
Warner 2009, USA Study (Survey)	14 anaesthesiology practices. 97 Anaesthesiology staff were surveyed. Post training, 87% Ask patients, 56% advise, 41% refer, 23% strongly agree/agree not enough time for AAR (S-1)
Warner 2011, USA Study (RCT)	300 pre-surgery patients randomised to quitline referral or 5As. 29/149 referral group had at least one quitline call; 0/151 control. No diff in self-report continuous abstinence at 1 or 3 months. No difference in NRT use, usefulness of advice from surgery doc.

	79% of quitline contacts made post-op (S-3)
Watts 2011, NZ Study (Service audit)	Conference Abstract. CCU Nurses encouraged to do ~3As, to become 'quit nurse'. Over two years, Ask/Advise up to ~100%, assist/refer ~50%. 'Quit nurses' went from 6 to 12 (S-1)
Whyte 2006, UK Study (Qualitative)	12 nurses interviewed/patient interactions taped. Smoking discussed, rarely acted on, training needed. (S-1)
Wicentowski 2008, USA Study (Service audit)	Algorithm to identify smoking status using info from discharge chart missing smoking info was 50-90% precise (S-1)
Wilber 2011, USA Study (Service audit)	Conference abstract. 800 nurses/docs. 24% had training, 75% usually/always took smoke stat, 28% spent 3/more mins on advice. ~70% likely/very likely to give leaflet/phone number. 15% un/very unlikely to give meds/refer (S-2)
Willaing 2004, Denmark Study (Survey)	Of 1429 HCPs, 30% smoked, 26% ex-smokers. 2.4% had received smoking training. Smokers underestimate health risk, less likely to give advice. Lower self-confidence in skills=less frequent advice (stats unclear though) (S-2)
Willett 2009, USA Study (Service audit)	Staff at 43 hospitals, marketing at HCPs, and 9000 community staff trained to fax refer. Referrals/month went from 68 to 412 (1/3 from hospitals). Less than ¼ enrolled, 60% unreachable (S-2)
Williams 2005, USA Study (Service audit)	76 staff from hospitals with high rankings for smoking counselling compared to 37 staff from low ranked hospitals (113 hospitals total). High ranked hospitals were more likely to take smoking status, prescribe, refer, document things. No differences in barriers to providing counselling (S-1)
Wilson 1998, Canada Study (RCT)	83 family physicians randomised to receive either normal care, NRT and advice or NRT plus training (use of gum, 1-6 FU visits and QD). There were significant differences in sustained abstinence rates at 1 year (8.8% (I) vs 6.1% and 4.4%) between arms but not for 1 year PP (8.8% (I) vs. 6.1% vs 4.4%). Training (85%) and gum (70%) groups more likely to mention smoking

	that usual care group (31%). Training group more likely to ask for a QD and arrange FU. Training (63%) and gum group (59%) more likely to suggest using gum than usual care group (9%) (S-2)
Wolfenden 2005, Australia Study (RCT)	Pre-operative patients were randomly assigned to an experimental group (EG; n=124) or usual cessation care group (UC; n=86). The EG intervention included the use of opinion leaders, consensus processes, computer-delivered cessation care, computer-generated prompts for care provision by clinic staff, staff training, and performance feedback. EG patients were significantly more likely than UC patients to report receiving brief advice by nursing (79% vs. 47%; $P < 0.01$) and anaesthetic (60% vs. 39%; $P < 0.01$) staff. EG patients who were nicotine dependent were also more likely to be offered preoperative nicotine replacement therapy (NRT) (82% vs. 8%; $P < 0.01$) and be prescribed postoperative NRT (86% vs. 0%; $P < 0.01$). The EG intervention was found to be acceptable by staff (S-2)
Wolfenden 2007, Australia Study (Survey)	1004 surgery patients self-assessed smoking via touchscreen computer. Patients and staff found this acceptable (S-1)
Wolfenden 2008, Australia Study (Survey)	Part of larger (unpublished) study. 23 of 67 pre-op smokers in fax referral group received call from quitline. Most patients thought quitline useful. 2 of 4 nurses felt referral too time-consuming. Cost of referral US$2 (S-3)
Wolfenden 2009, Australia Discussion (Commentary)	Comment on previous studies, how they address barriers: lack of organisational support, perceived patient objection, lack of systems to identify smokers, lack of staff time and skill, perceived inability to change care practices, perceived lack of efficacy of cessation care and cost of providing care (D-1)
Xiao 2011, China Study (Service audit)	Implementing smoke-free in 41 hospitals in China, led to reduction in staff smoking, outside smoking areas helped, organisational change needed chief executives involved (S-1)
Zhang 2005, USA Study (Service audit)	38 hospitals to improve post-MI care, computerised data feedback, performance improvement teams, use of aspirin, beta-blockers etc. improved, stop-smoking advice increased from 35% to 81% (S-1)

Appendix 3 – Summary of Studies Included in Chapter 2

The table below summarises the studies included in Chapter 2.

Author	Summary
Abatemarco 2007, USA Study (Survey)	196 MWs responded to a clinical practice survey. 99% ask about smoking and advise to quit, 44% set TQD, 36% advise on meds, 24% offer FU, 38% refer, 75% check tobacco use at each visit. 11% smoke themselves, 21% had cessation training, 81% would want it. Barriers: 81% patients resistance, 78% lack of patient interest, 73% competing priorities, 73% lack of training, 63% lack of resources for referral, 49% lack of time (S-3)
Abrahamsson 2005, Sweden Study (Qualitative)	24 MWs interviewed, MW's experience described as 'avoiding', 'informing', 'friend-making', and 'co-operating'. Authors agenda is to move MWs role from expert advice to counselling mode to 'enable' and 'give the space to grow' (S-1)
Albrecht 2011, USA Study (Retrospective)	5A staff training programme, 144 smokers recruited, 78 participated (unclear), 22 'able to abstain for at least part of the evaluation period'. Of 326 smokers, 202 received cessation information, and 144 were willing to take part in the programme (S-1)
Aquilino 2003, USA Study (Qualitative)	Focus groups with 25 Women, Infants, and Children clinic staff (mix of nurses, dieticians, social workers). Relevant factors: time, priorities, approach to clients, training. Barriers: Not knowing if brief interventions work, booklets for clients, no mechanism to track outcome. Includes quotable staff quotes and details (S-2)
Bakker 2003, Netherland Study (Prospective)	118 MWs given intervention manual, card with 7 steps, videos for clients, and training or not (not randomised), about half filled in follow-up questionnaire, clients also. MWs reported they provide interventions a lot, less according to clients. (Unpublished outcome study showed short-term but no long-term effect of MW intervention on women, no effect on partners) (S-1)
Bakker 2005, Netherlands	237 MW filled in questionnaire. More active MW believe in the efficacy of their advice more (S-1)

Study (Survey)	
Battersby 2003, UK Study (Service audit)	Doncaster service employs 2 specialists (MWs) and trains all MWs to refer. 150 quit in a year - an example of good practice (S-3)
Beenstock 2012, UK Study (Survey)	Midwives sent a survey to complete on implementation difficulties of NICE recommendations to ask, refer, advise and validate pregnant smokers. Midwives were not positive about the consequences of their actions on smoking cessation. Only 19% of respondents agreed that discussion of smoking with pregnant women was not usually perceived as nagging. Midwives also reported lack of resources to provide SC (S-1)
Bishop 1998, Australia Study (Qualitative)	Staff (unclear if specifically MWs) believe that counseling is not very successful, they lack skills, and have little time. Little structural support and unclear public health messages (S-2)
Bryce 2009, UK Study (Prospective)	Development, implementation and evaluation of an intervention to help young pregnant smokers. MWs willing to refer. Of 152 eligible clients referred within the 16-month period, 79 (52%) joined CATCH. Of those who joined, 18 (22.8%) were self-reported non-smokers at 3 months, of whom 16 (20.3%) were validated as non-smokers using carbon monoxide monitoring. Thirteen (16.5%) clients reported being smoke free at 12 months, of whom 10 (12.7%) were validated as non-smokers at 12 months (S-3).
Bull 2007, UK Study (Qualitative)	Two focus groups with MWs and HVs, felt women have reasons to smoke, need to be ready to quit and have multidisciplinary team to help. Not sure what works, lack of feedback, not sure about NRT, not clear if training needed (S-1)
Cooke 1996, Australia Study (Survey)	425 MWs responded to a questionnaire. Most provided brief advice occasionally, but not more intensive counselling and setting TQD. Barriers: Lack of policies, time, and ability to counsel (S-3)
Cooke 1998, Australia	203 MWs and doctors filled in a questionnaire. Most do not do much, lack of specific procedures, materials, time, training. Pessimism about effectiveness (S-3)

Study (Survey)	
Cooke 1999, Australia Study (RCT)	23 clinics (12 and 11) randomised, simple (mail out) or intensive (personal training) dissemination of 'Fresh Start'. 7 and 9 clinics adopted the programme (S-2)
Cooke 2000, Australia Study (RCT)	Same study as above, managers listed barriers: negative client reaction; insufficient time; lack of support from colleagues; inability to provide follow-up to clients; staff turnover; poor access and storage of materials (S-2)
Groner 2005, USA Study (Service audit)	Seven home-health nurses (USA equivalent of health visitors) received 4h training, plus two sets of 2h booster session, in CBT-based relapse prevention for new mothers. Intervention delivered over four sessions (hospital, home, and phone contacts) during first two months post-partum. Of 121 mothers enrolled, 2/3 received at least one home visit; 85% recalled discussing smoking, ¾ had positive feelings about discussing smoking and only 4% had negative feelings. 43% felt the intervention was helpful. Four of the seven nurses believed patients were receptive to advice. No cessation data. (S-3)
Hartmann 2007, USA Study (Survey)	Survey of 844 (74% response rate) maternity care providers to assess the implementation of the 5As and barriers. The majority ask and advise, but less assess, assist and arrange. Most (71%) reported lack of time as a barrier, lack of patient interest (68%) and limited effectiveness (39%). Having a counseling resource was associated with better implementation of the 5As (S-2)
Hassel 2007, Germany Discussion (Systematic review)	A review on MI training – no useable information.
Herberts 2012, UK Study (Qualitative)	Three focus groups of 15 MWs from 2 acute NHS trusts in London, and 10 semi structured interviews with pregnant smokers. MWs report barriers that include: time, relationship with patient, and see smoking as the least of women's worries. Pregnant women perceive a feeling of 'hardship' (it's not fair to have to give up). However they expect to be asked about smoking. MWs assume that if women are still smoking they won't want to quit. Half of pregnant women said that had not

	received consistent or sufficient information from their MW. MWs assume that they know the risks. Women want to know the "proper truth". Felt that an increase on visual information on the risks might encourage women to quit (S-3)
Herzig 2006, USA Study (Qualitative)	Focus groups of 49 O&G consultants and MWs to investigate methods of addressing alcohol use, drug use, smoking and domestic violence. Showed that maternity care providers found it easier to discuss smoking than the other issues (S-1)
Hyndman 2005, Canada Study (RCT)	138 nurses who provided routine pregnancy and post-partum care recruited from two hospitals. Hospitals were randomised to an intervention that aimed to increase adherence to clinical guidelines (academic detailing visits plus self-study package) or usual care. Multiple regression analysis showed that the intervention significantly enhanced adherence to practice guidelines ($p<0.001$) (S-3)
Jones 2012, UK Discussion	Core SSS is used rather than dedicated pregnancy advisors. Midwives refer pregnant smokers and specialist advisors contact clients twice by telephone, and send a letter if there is no response. Clients are fast tracked into an appointment to allow for the longest cessation period during their pregnancy. On-going 'maintenance' support, experience in the field suggests that very few clients attend follow-up appointments. Routine home visits by dedicated stop-smoking advisors are an expensive provision, unprecedented in behaviour change interventions, but they can enhance service reach (D-3).
Jordan 2006, USA Study (Survey)	125 O&G consultants (50% response rate) surveyed to assess perceptions and use of the 5As. Most always ask at each visit (62%) and advise (66%), fewer assess (42%) assist (29%) and arrange (6%). Barriers cited include lack of time, not knowing where to refer, pregnant smokers not responsive to suggestions, lack of reimbursement, previous failures, low confidence in ability to help, fear of offending women (S-2)
Lee 2006, UK Study (Survey)	Survey conducted on identifying examples of good practice in pregnancy services. Targeted services with the highest successes and found that they only had minimal genuine treatment in place. Three beacon service shared similar ingredients seen as necessary for such a service; training, NRT and multi session intervention (S-3)

Lin 2003, USA Study (Service audit)	Training staff in brief counselling led to better records but no effect on smoking among patients. There was a reduction in self-reported cigs/day. Pre-post comparison (S-no rating as limited information given)
Mantzari 2012, UK Study (Qualitative)	36 women involved in an incentives study were interviewed about their experience. Those incentivised used the SSS more often, were motivated by regular contact and feedback (being monitored). Non-incentivised women reported difficulty in getting NRT, which had a detrimental effect on their quit rates. Incentives seen as added bonus rather than the reason for quitting (S-3)
McGowan 2010, UK Study (Survey)	Glasgow pregnancy service, all women CO, smokers referred on opt-out basis for specialist treatment (NRT, phones and 2 visits to clinic). CO difficult for MWs (35% done), fine for auxiliary nurses (89% done). Of some 12,000 pregnant women, 1936 smokers referred, 386 (20%) attended, 370 set TQD and 117 (32%) quit at 4 weeks (S-3)
Owen 2001, UK Study (Survey)	Assessed the use of saliva cotinine in pregnant women (N = 1009). Saliva cotinines revealed under-reporting among pregnant women by about 3% (S-3).
Shipton 2009, UK Study (Retrospective)	Among a random sample of 3,475 pregnant Scottish women, 839 declared that they were smokers. The analysis of serum cotinine showed that 1,046 women were in fact smokers, i.e. 19.8% of smokers did not admit that they smoke (S-3).
Taylor 2001, UK Study (Survey)	An evaluation of the UK pregnancy service which showed no difference in efficacy of smoking cessation specialists who had or had not got a background in midwifery (S-3)

Valanis 2003, USA Study (Prospective)	Research derived smoking cessation intervention (STORK programme) in prenatal clinics, inpatient post-partum services, and paediatric services. Intervention was based on SOC and MI (but encouraged cutting down for those who did not want or were unwilling to quit). Involved screening, advice to quit, and documenting what cessation support was provided and/or used. Clinicians were assisted by booking forms that contained smoking specific fields and assessment and counseling forms. Audit and feedback was also in place to promote clinicians to act. The intervention increased advice to quit from 83% to 94%, which was sustained over the 3-year study period. Smoking brochures were the most frequently used intervention. Advice to quit was less frequent in the paediatric/post-natal setting (increased from 44% to 61%). The offer of cessation support was less frequent than screening. Documentation was a problem. Barriers: staff low self-efficacy, concerns about patient response, time, lack of conviction that the intervention was effective. (S-3)
Van Berkel 1999, Netherlands Study (Qualitative)	569 of 4863 consecutive patients with CVD were interviews 1.6 years after discharge. Smoking status was documented in 82% of patients. Documentation was more common in certain groups (e.g. males, those booked for bypass surgery). 57% received advice to quit. 59% of smokers surveyed at follow-up had quit (S-3)
Velasquez 2000, USA Study (Survey)	Assessed the training and implementation issues associated with a brief MI intervention delivered by nurses, social workers, and case managers who provide pre-natal care. One of the main barriers was HCPs who did not embrace the interventions. The authors suggest that it may be better to train only those who are interested. Other barriers included limited follow-up of trainees, organisational factors and competing priorities (S-2)
Wall 1995, USA Study (RCT)	49 paediatric practices (128 practitioners) randomised to give either minimal (written information in hospital about passive smoking and advice to quit) or extended (minimal intervention plus brief oral (two minutes) and written advice at 2 week, 2, 4, and 6 month routine ‘well baby’ visits) intervention. Extended group practitioners received 45 minutes training in smoking cessation. Mothers in extended intervention more likely to receive more materials and advice. 2,901 mothers enrolled. In the extended group, self-reported quitting at 6m was higher

	(4.7% v 2.1%), and relapse rates in recent quitters at enrolment were lower (53% v 63%). (S-3)
Walsh 1996, Australia Study (Prospective)	Of 204 MW-identified non-smokers, 166 gave urine samples. 13 had cotinine levels >282nmol/l suggesting that they were smokers (S-2)
Whitworth 2009, UK Discussion Discussion (Systematic review)	Cochrane Review on pre-conception health promotion on pregnancy outcomes. Only one study reported smoking cessation outcome. Overall there was no effect of intervention (D-3)
Windsor 2000, USA Study (Survey)	Used an evaluation template developed and applied to 4 published studies on smoking cessation in pregnancy. The greater the number of patient contacts required, the more problems there were. Staff motivation, low pay, no time/space a problem in one study. Regular training helped in another study (S-2)
Winickoff 2010, USA Study (RCT)	101 smoking parents of newborns. Parents in the intervention group received the in-hospital counseling session, 94% had a fax sent to a smoking cessation provider, and 36 (75%) accepted quitline enrolment. Of 36 parents who were reached at 3-month follow-up self-reported 24-hour quit attempts were higher in the intervention group versus control group (64% vs 18%; P = .005), and cotinine-confirmed 7-day abstinence rates were non-significantly higher in the intervention group (9%) compared to control (3%) (S-3)
Wisborg 1998, Denmark Study (RCT)	Quasi-random trial. Training MW had no impact on cessation, v non-trained MW. No process variables (S-1)

Appendix 4 – Table of Excluded Studies

The table below brief summarises the reasons for exclusion of studies.

Anon (Kai Tiaki Nursing Journal) (2011)	Setting is not in the scope of the review
Bech (1999)	Not available in English
Bishop (1999)	Duplicate of previous paper
Cummings (1989a)	Setting is not in the scope of the review
Cummings (1989b)	Setting is not in the scope of the review
Hafstad (1995)	Not available in English
Hasuo (2004)	Not available in English
Heegard (2001)	Commentary
Houston 2010	Setting is not in the scope of the review
Jimonez Ruiz (1994)	Not available in English
Kottke (1998)	Setting is not in the scope of the review
Lennox (1998)	Setting is not in the scope of the review
McAlpine (2008)	Survey of smoking cessation in UK hospitals only
Sinclair (1998)	Setting is not in the scope of the review
Strecher (1991)	Setting is not in the scope of the review
Wolfenden (2008)	Setting is not in the scope of the review
Wagner (2002)	Not smoking specific

Appendix 5 – List Studies Unavailable

The full text papers of the following studies could not be retrieved.

Anonymous (2004)
Allaway (1996)
Campbell (1991)
Campbell (2003)
Cohen (1987)
Gadomski (2010)
Giovino (1990)
Glover (2008)
Goldstein (1992)
Gordon (2011)
Grizeau (1998)
Gyenes (2005)
Haire-Joshu (1995)
Helwig (1998)
Hennrikus (2001)
Hodson (2002)
Holmes (2001)
Johnson (2006)
Latts (2002)
Lazenbatt (1991)
Lindsay (1989)
McCarty (2000)

McDaniel (2000)
Merrill (2010)
Miedinger (2011)
Morgan (2005)
Ragucci (2009)
Ripley-Moffitt (2010)
Shaughnessy (1999)
Shi (2011)
Stansby (2006)
Vial (2002)
Waller (1996)
Ward (2003)
Werrett (2005)
Wewers (1994)
Wewers (1997)
Whincup (1992)
Winstanley (2008)
Zahnd (1990)

SMOKING CESSATION IN MENTAL HEALTH SERVICES

Review 4: Effectiveness of Smoking cessation interventions in Mental health

PRODUCED BY: UK Centre for Tobacco Control Studies (UKCTCS, http://www.ukctcs.org/)

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November 2021: NICE guidelines PH45 (June 2013) and PH48 (November 2013) have been updated and replaced by NG209.
The recommendations labelled [2013] or [2013, amended 2021] in the updated guideline were based on these evidence reviews.
See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

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ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

BACKGROUND

The strong relationship between smoking and severe mental illness, as well as the complexity of neurobiological, environmental and genetic factors contributing to it, are well recognised. Smoking prevalence among people diagnosed with a severe mental illness, such as schizophrenia, can reach 70% or more, by far exceeding prevalence in the general population (21%), and levels of tobacco dependency have also been found to be higher. Much of the excess mortality and morbidity in people with severe mental illness has been found to be associated with smoking related conditions, and rates of cardiovascular and respiratory diseases as well as cancers are increased compared to the general population. Although smoking has been identified as one of the major contributors to health inequalities in this population, smoking is still the norm in many mental health settings, and no best practice models for the provision of effective support in mental health settings have been identified.

AIM OF THE REVIEW

To assess the effectiveness of smoking cessation and temporary abstinence interventions in mental health services, including strategies for referring people to stop smoking or hospital based stop smoking services, for the populations of interest.

QUESTIONS OF THE REVIEW

The review will address the following key research questions:

i) How effective are smoking cessation interventions in helping people from the populations of interest?

ii) How effective are interventions for temporary abstinence in helping people from the populations of interest?

iii) How effective are current strategies/approaches used by secondary care mental health services for identifying and referring people from the population of interest to stop smoking or hospital based stop smoking services?

iv) How effective are current strategies/approaches used by secondary care mental health services for identifying and providing people from the population of interest with smoking cessation information, advice and support?

v) Which strategies/approaches are effective in encouraging mental health care professionals to record smoking status and refer populations of interest to stop smoking services?

Subsidiary questions include:

- *How does the effectiveness of smoking cessation and temporary abstinence interventions vary by mental health diagnosis, gender, sexual orientation, age, ethnicity, religion, socioeconomic status, disability, and by populations of interest (including patients, household members, visitors and staff)?*
- *Are there differences in the effectiveness of smoking cessation and temporary abstinence interventions by deliverer, timing (or point in the care pathway), frequency, duration, and severity of dependence, and setting in which the intervention is assessed, for example in-patients versus out-patient?*
- *What are the adverse events and other consequences associated with using smoking cessation and temporary abstinence interventions in the populations of interest?*

METHODS

A comprehensive systematic review was conducted to address the questions of the review. A comprehensive search strategy of electronic databases, websites, and reference screening was performed, with searches being conducted in February 2012. We considered comparative epidemiological studies which include the following populations of interest of any age who smoke:

  - All users of secondary care mental health services, including those who are in the process of being referred to or have recently been discharged from child, adolescent, adult or older people mental health services:
    - In-patient, residential and long-term care for severe mental illness in hospitals, psychiatric and specialist units and secure hospitals
    - Patients who are within the care of specialist community-based multidisciplinary mental health teams
- People living in the same household as a mental health service user, such as partners, parents, other family members and carers
- Visitors to secondary care mental health setting who are not receiving treatment or care, such as relatives or friends of patients or service users
- Staff (including support staff, volunteers, agency/locum staff and staff employed by contractors) working in secondary care mental health settings, in particular those who have direct contact with patients and service users

We included any pharmacological, psychological, behavioural, or self-help intervention that aims to assist with smoking cessation or temporary abstinence. We included any strategies, protocols or systems used by relevant health professionals to help identify smokers, record advice given and refer them to services, alone and share information between different groups of health professionals and across the care pathway. Primary outcomes of interest included the proportion of participants who made successful quit attempts; changes in mean biochemically validated levels of smoking from baseline; and self-reported cigarette consumption. Other outcomes included an assessment of current strategies using the number of referrals to and contacts with stop smoking services; a comparison of the number of smoking cessation referrals between mental health care and other settings; assessments of improvement in health (for example, recovery rates); changes in recording or referral procedures or care pathway development, following targeted interventions to

support the implementation of tobacco treatment services in mental health settings. Further outcomes of interest included measures of self-efficacy, nicotine dependence and withdrawal, motivation, confidence, where these were reported in addition to assessing smoking cessation ascertained as described above. We additionally assessed the proportion of populations of interest with adverse events.

Two reviewers independently screened 10% of titles and abstracts, and full texts to ensure high agreements between reviewers. The remaining titles and abstracts, and full texts were then screened by one of the reviewers. 10% of the included studies were independently data extracted and quality assessed by two reviewers to ensure high agreement; then the remaining papers were extracted by one of the reviewers. Meta-analyses were conducted using random effect models, with heterogeneity quantified using I^2. Data are presented as odds ratios (OR) with 95% confidence intervals (CI). P values<0.05 were deemed statistically significant.

Evidence statements based on an aggregated summary of the available evidence were produced, which reflected the strength (quality, quantity and consistency) of the evidence and statements regarding its applicability were made. The quality of the evidence was categorised as strong (where statements were based on evidence from several high quality studies), moderate (where statements were based on evidence from either one high study, or a mixture of high and lower quality studies), weak (where statements were based on evidence from lower quality studies), or very weak (where statements were based on evidence from individual lower quality studies). Statements were also made where there is a lack of evidence. Statements regarding the applicability of the evidence to the UK setting were also reported and categorised as directly applicable, potentially applicable, or not applicable.

RESULTS

51 studies were included, with the majority focusing on populations with schizophrenia. The majority of studies were conducted in outpatient mental health populations, and most studies recruiting participants directly from the users of particular outpatient or in-patient mental health care clinics. 41 studies were based on USA populations. The sample size of the studies ranged from 5 to 943. The interventions for smoking cessation under assessment in the studies were behavioural therapy (high intensity, 11 studies; low intensity, 2 studies), nicotine replacement therapy (6 studies), bupropion (10 studies), clozapine (3 studies), or NRT with behavioural therapy (3 studies), combination of NRT with bupropion (3 studies), and four studies were identified which assessed the effectiveness of varenicline. Single studies assessed the effectiveness of contingency payments; fluoxetine, galantamine, naltrexone, contingency payments with either bupropion or NRT. The interventions in the studies which were specifically assessed for smoking reduction were bupropion (1 study), bupropion with behavioural therapy (1 study), and contingency payment with NRT (1 study). The majority of studies used a parallel group RCT design.

EVIDENCE STATEMENTS

i) How effective are smoking cessation interventions in helping people from the populations of interest? Subsidiary question includes: What are the adverse events and other consequences associated with using smoking cessation and temporary abstinence interventions in the populations of interest?

EVIDENCE STATEMENTS – HIGH INTENSITY BEHAVIOURAL THERAPY (WITHOUT PHARMACOTHERAPIES)

EFFECTIVENESS

ES1.1 There is moderate evidence from two trials (**McFall 2005 [RCT, USA, +]; McFall 2010 [RCT, USA, +]**) to suggest integrated tailored behavioural therapy was more effective for increasing smoking cessation in outpatients for PTSD in the short (pooled OR 3.04, 95% CI 1.65-5.60) and long (OR 1.83, 95% CI 1.26-2.66) term than usual standard of care (referral to a specialised smoking cessation clinic).

ES1.2 There is mixed weak evidence from four studies regarding the effectiveness of high intensity behavioural therapy in people with psychiatric disorders. One study (**Currie 2008 [Quasi-RCT, Canada, +]**) suggested high intensity behavioural therapy given for 8 weeks was marginally more effective than given for 4 weeks in outpatients; however no formal comparisons could be made to assess statistical significance. Evidence was mixed from two further studies where one study demonstrated no significant difference in abstinence between motivational interviewing or brief advice in 191 in-patients **(Brown 2003 [RCT, USA, +]**; long term outcome, OR 1.16, 95% CI 0.59-2.31), whereas the other demonstrated significantly fewer people smoked at short term follow-up in the high intensity behavioural therapy group compared to no intervention in 38 outpatients (**Kisely 2003 [NRCT, Australia, -])**. However, there was evidence from one study of 123 outpatients (**Morris 2011 [RCT, USA, +]**) which suggested high intensity behavioural therapy in addition to a quit-line service was more effective than quit-line service alone for reducing cigarette consumption (OR 3.16, 95% CI 1.04-9.65).

ES1.3 There is moderate evidence from three studies (**George 2000 [quasi-RCT, USA, +]; Wojtyna 2009 [NRCT, Poland, -]; Williams 2010 [RCT, USA, +]**) to suggest high intensity behavioural therapy is no more effective than lower intensity behavioural therapy for smoking cessation in the short (Pooled OR 1.20, 95% CI 0.39-3.72) or medium (OR 0.56, 95% CI 0.10-3.15) term in in-patients and outpatients with schizophrenia. Please note that two of these studies (**George 2000 [quasi-RCT, USA, +]; Williams 2010 [RCT, USA, +])** gave all participants NRT in addition to their behavioural therapy, and the intensity of the behavioural therapy in the control group of the **Williams 2010 [RCT, USA, +]** was relatively high.

The majority of evidence on high intensity behavioural therapy is directly applicable to the UK setting, as there is no reason to assume that the interventions could not be implemented in UK

outpatient and in-patient settings. Six of the studies were conducted in the USA, with individual studies being conducted in Australia, Canada, China, and Poland.

Unintended Consequences

ES19.1 There was moderate evidence from one trial (**McFall 2010 [RCT, USA, ++]**) to suggest smoking cessation arising from using high intensity behavioural therapy does not result in any adverse effects relating to psychiatric hospitalisation, cardiac or gastrointestinal related events in 943 outpatients with PTSD. This evidence is applicable to the UK setting.

ES24.1 There is moderate evidence from three trials in populations with mental health disorders (**Kisely 2003 [NRCT, Australia, -]; Currie 2008 [quasi-RCT, Canada, +]; Morris 2011 [RCT, USA, +]**) to suggest high intensity behavioural therapy programmes did not worsen mental health outcomes compared to standard behavioural therapy programmes on psychiatric symptoms.

ES24.2 There is moderate evidence from two trials focusing on populations with schizophrenia (**George 2000 [quasi-RCT, USA, +]; Williams 2010 [RCT, USA, +]**) to suggest high intensity behavioural therapy programmes did not worsen mental health outcomes compared to standard behavioural therapy programmes on psychiatric symptoms.

ES24.3 There is moderate evidence from two trials focusing on populations with PTSD (**McFall 2005 [RCT, USA, +]; McFall 2010 [RCT, USA, ++]**) to suggest high intensity behavioural therapy programmes did not worsen mental health outcomes compared to standard behavioural therapy programmes on psychiatric symptoms.

There is no reason to assume that unintended consequences related to the use of high intensity behavioural therapy programmes are not applicable to the UK setting.

Evidence statements – Low Intensity Behavioural Therapy (without Pharmacotherapy)

Effectiveness

ES2.1 There is very weak evidence from one RCT in 128 mental health outpatients (**Axtmayer 2011 [RCT, USA, -]**) to suggest brief intervention either from using a Quitline or a face-to-face counsellor resulted in a significant reduction in the number of cigarettes smoked per day from baseline (Mean reductions from 16.1 to 9.3 cigarettes/day, 17.9 to 11.1 cigarettes/day, respectively).

ES2.2 There is moderate evidence from one cluster RCT in 304 outpatients with schizophrenia or schizoaffective disorders (**Dixon 2009 [cluster RCT, USA, ++]**) to suggest low intensity behavioural support resulted in no significant difference in abstinence or smoking consumption.

The evidence from the two studies based on low intensity behavioural therapy is directly applicable to the UK setting as there is no reason to assume the interventions could not be implemented in UK outpatient and in-patient settings. Both studies were conducted in the USA.

EVIDENCE STATEMENT – CONTINGENCY PAYMENTS

EFFECTIVENESS

ES3.1 Weak evidence from one non-randomised within-subject reversal design trial (**Roll 1998 [NRCT, USA, -]**) suggested contingency payments rewards significantly reduced expired CO levels in 11 outpatients undergoing treatment for schizophrenia or schizoaffective disorders.

The evidence for contingency payments as an intervention for smoking cessation is potentially applicable to the UK as intervention may be feasible to the UK setting; however, this does not reflect current clinical practice in the UK. The study was conducted in the USA.

EVIDENCE STATEMENTS - BUPROPION

EFFECTIVENESS

ES4.1 There is weak evidence from one trial (**Hertzberg 2001 [RCT, USA, +]**) to suggest bupropion (300mg/day) is not effective for smoking cessation at short term follow-up in 15 male outpatients with PTSD.

ES4.2 There is very weak evidence from one trial (**Weinberger 2008 [RCT, USA, -]**) to suggest bupropion (300mg/day) is not effective for smoking cessation at short term follow-up in 5 outpatients with bipolar disorder.

ES4.3 There is strong evidence from pooled analyses comprising a total of five trials (**George 2002 [RCT, USA, ++]; Weiner 2011b [RCT, USA, ++]; Evins 2007 [RCT, USA, ++]; Evins 2001 [RCT, USA, +]; Evins 2005 [RCT, USA, ++]**) that bupropion (300mg/day) is effective for increasing smoking cessation in the short term in outpatients with schizophrenia (Pooled OR 3.80, 95% CI 1.58-9.15); but mixed strong evidence from pooled analyses comprising a total of three trials (**Evins 2007 [RCT, USA, ++]; George 2002 [RCT, USA, ++]; Evins 2005 [RCT, USA, ++]**) regarding the effectiveness of bupropion (300mg/day) for smoking cessation in the medium term in outpatients with schizophrenia (continuous abstinence, OR 3.00, 95% CI 1.29-7.00; point prevalence abstinence, pooled OR 2.80, 95% CI 0.51-15.53). Also, there is moderate evidence from one trial (**Evins 2007 [RCT, USA, ++]**) that bupropion is not effective for smoking cessation in the long term in outpatients with schizophrenia (OR 1.60, 95% CI 0.23-11.01).

ES4.4 There is moderate evidence from pooled analysis of two trials (**Evins 2007 [RCT, USA, ++]; Evins 2001 [RCT, USA, +]**) that bupropion (300mg/day) is effective for smoking reduction in the short term (Pooled OR 4.81, 95% CI 1.36-17.08) and medium (Pooled OR 5.11, 95% CI 1.28-20.39) term in outpatients with schizophrenia; however, there is very weak evidence from one trial (**Fatemi 2005 [RCT, USA, -]**) to suggest bupropion (dose not stated) had no significant effect on smoking reduction assessed as number of cigarettes per day smoked in outpatients with schizophrenia.

The evidence from the studies based on bupropion is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical

prescribing practice in the UK. The majority of studies were conducted in the USA, with individual studies being conducted in China, Iran, and Israel.

Adverse Events

ES20.1 There is strong evidence from 10 trials (**George 2002 [RCT, USA, ++]; Weiner 2011b [RCT, USA, ++] ; Bloch 2010 [RCT, Israel, –]** ; **Evins 2007 [RCT, USA, ++]; Evins 2005 [RCT, USA, ++]; Evins 2001 [RCT, USA, +] ; Li 2009 [RCT, China, –]**; **Tidey 2011 [RCT, USA, ++]; Fatemi 2005 [RCT, USA, -]; George 2008 [RCT, USA, ++]**) to suggest that bupropion was well tolerated in participants diagnosed with schizophrenia or schizoaffective disorders, with expected side effects of bupropion being seen (relating to dry mouth, nausea and headaches).

ES20.2 There is weak evidence from one trial (**Hertzberg 2001 [RCT, USA, +]**) to suggest bupropion was well tolerated in 15 male outpatients with PTSD.

ES20.3 There is very weak evidence from one trial (**Weinberger 2008 [RCT, USA, –]**) to suggest bupropion was well tolerated in 5 outpatients diagnosed with bipolar disorder.

Adverse events related to the use of bupropion are likely to be applicable to the UK setting, as there are no reasons to assume otherwise.

Unintended Outcomes

ES25.1 There is moderate evidence from eight trials (**Hertzberg 2001 [RCT, USA, +]; George 2002 [RCT, USA, ++]; Arkbapour 2010 [RCT, Iran, +]; Weiner 2011b [RCT, USA, ++]; Evins 2007 [RCT, USA, ++]; Evins 2005 [RCT, USA, ++]; Evins 2001 [RCT, USA, +]; Fatemi 2005 [RCT, USA, -]**) to suggest bupropion (predominately given at 300mg/day) did not worsen mental health outcomes in participants with schizophrenia or schizoaffective disorders.

ES25.2 There is moderate evidence from one trial (**George 2002 [RCT, USA, ++]**) to suggest that whilst bupropion (300mg/day) resulted in no significant difference in positive symptoms of schizophrenia, there was a significant reduction in negative symptoms of schizophrenia.

ES25.3 There is weak evidence from one trial (**Evins 2001 [RCT, USA, +]**) to suggest bupropion (150mg/day) significantly reduces weight in the short term in 18 outpatients diagnosed with schizophrenia.

ES25.4 There is very weak evidence from one trial (**Weinberger 2008 [RCT, USA, -]**) to suggest bupropion (300mg/day) has no detrimental effect on mood changes in 5 outpatients with bipolar disorder.

Unintended consequences related to the use of bupropion are likely to be applicable to the UK setting, as there are no reasons to assume otherwise.

Evidence Statement - Clozapine

Effectiveness

Clozapine is an atypical (new generation) antipsychotic medication. Switching from typical antipsychotic medications to atypical antipsychotic medications has been suggested to reduce smoking.

ES5.1 There is moderate evidence from three trials (**McEvoy 1995 [RCT, USA, -]; McEvoy 1999 [RCT, USA, +]; De Leon 2005 [RCT, USA, +]**) suggesting higher doses of clozapine (350-600mg/day) in in-patients with schizophrenia or schizoaffective disorders may reduce the self-reported number of cigarettes smoked per day; however, no effects were seen on objective markers of smoking consumption (expired CO or plasma nicotine levels).

The evidence from the three studies based on clozapine as a smoking cessation medication is potentially applicable to the UK setting as there is no reason to assume that the intervention would not have the same outcome in a UK setting. All three studies were conducted in the USA.

Unintended consequences

ES26.1 There is weak evidence from two trials (**McEvoy 1995 [RCT, USA, -]; McEvoy 1999 [RCT, USA, +]**) to support the assumption that moderate to high plasma levels (200-450ng/ml) of clozapine are significantly more likely to reduce psychiatric symptoms and severity of symptoms in schizophrenia than lower plasma levels (50-150ng/ml).

Unintended consequences as a result of using clozapine are likely to be applicable to the UK setting, as there is no reason to assume that this would not be the case.

Evidence statement – Fluoxetine

Fluoxetine is an antidepressant from the selective serotonin reuptake inhibitor (SSRI) class. It has been suggested that antidepressant, such as fluoxetine, may be effective for smoking cessation.

Effectiveness

ES6.1 There is weak evidence from one trial (**Cornelius 1997 [RCT, USA, +]**) of 25 in-patients with major depression suggested fluoxetine (40mg/day) had no significant effect on the number of cigarettes smoked per day in the short term.

The evidence from the individual study on fluoxetine as a smoking cessation medication is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. The study was conducted in participants with co-morbid alcohol dependence in the USA.

EVIDENCE STATEMENT - GALANTAMINE

Galantamine is an alkaloid that is used for the treatment of mild to moderate Alzheimer's disease and other memory impairments. It has been suggested that galantamine may be useful for smoking cessation.

EFFECTIVENESS

ES7.1 There is very weak evidence from one RCT of 42 inpatients and outpatients with schizophrenia (**Kelly 2008 [RCT, USA, -]**) of no effect of galantamine (maximum dose of 24mg/day) on self-reported and objective markers of cigarette use in the short term.

The evidence from the individual study on galantamine as a smoking cessation medication is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. The study was conducted in the USA.

EVIDENCE STATEMENT – NALTREXONE

Naltrexone is an opioid receptor antagonist which is used for the treatment of alcohol dependence and opioid dependence.

EFFECTIVENESS

ES8.1 There is moderate evidence from one RCT in 79 outpatients diagnosed with schizophrenia or schizoaffective disorders with co-morbid alcohol dependence that naltrexone (50g/day) had no significant effect on abstinence or self-reported numbers of cigarettes smoked per day (**Szombathyne-Meszaros 2010 [RCT, USA, +]**).

The evidence from the individual study on naltrexone as a smoking cessation medication is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. The study was conducted in participants with co-morbid alcohol dependence in the USA.

EVIDENCE STATEMENTS – NICOTINE REPLACEMENT THERAPY

EFFECTIVENESS

ES9.1 There is moderate evidence from one trial (**Hartman 1991 [RCT, USA, ++]**) to suggest NRT (8mg given once) is effective for smoking reduction in the very short term (7 hours follow-up) in 14 in-patients and outpatients with psychiatric disorders.

ES9.2 There is weak evidence from one trial (**Williams 2007 [RCT, USA, +]**) to suggest there is no significant benefit in smoking cessation from using high dose NRT (42mg patch) compared to standard dose NRT (21mg patch) in the short term in 51 outpatients with schizophrenia.

ES9.3 There is mixed very weak evidence from two trials (**Dalack 1999 [NRCT, USA, -]; Chou 2004 [RCT, China, -]**) regarding the effectiveness of standard dose NRT (22mg/24hr or 14mg/day) for smoking reduction or cessation in schizophrenia, where a significant decrease in mean expired CO levels was seen on the day following the patch application, but no reduction in the number of cigarettes smoked in one trial (**Dalack 1999 [NRCT, USA, -]**). In the other trial (**Chou 2004 [RCT, China, -]**), significant reductions in expired CO levels, self-reported number of cigarettes smoked per day and point prevalence abstinence (bio-verified by CO<10ppm) were seen in the NRT patch compared to placebo.

ES9.4 There is mixed weak evidence from two trials (**Thorsteinsson 2001 [RCT, USA, +]; Hill 2007 [NRCT, USA, -]**) regarding the effectiveness of standard dose NRT (21mg/24hr or 14mg/day) for smoking reduction or cessation in major depression, where smoking cessation was significantly more likely in the short term in one study (**Thorsteinsson 2001 [RCT, USA, +]**), but no significant difference was seen in the number of cigarettes smoked in the short term in the other study (**Hill 2007 [NRCT, USA, -]**).

The evidence from the studies on NRT is applicable to the UK setting as the study was predominately based on outpatient populations with mental health disorders, and the intervention reflects current clinical prescribing practice in the UK for smoking cessation, and could be feasible within populations with mental health disorders. The studies were conducted predominately in the USA, with a further study being conducted in China.

ADVERSE EVENTS

ES21.1 There is moderate evidence from four trials (**George 2000 [quasi-RCT, USA, +]; Dalack 1999 [NRCT, USA, +]; Williams 2007 [RCT, USA, +]; Tidey 2002 [NRCT, USA, –]**) to suggest standard dose NRT patches (21 or 22mg/day) are well tolerated in participants with schizophrenia or schizoaffective disorders, with expected side effects being reported (irritability at patch site).

ES21.2 There is weak evidence from one trial (**Williams 2007 [RCT, USA, +]**) to suggest high dose NRT patches (42mg/day) are well tolerated in schizophrenia and schizoaffective disorder.

ES21.3 There is weak evidence from two trials (**Hartman 1991 [RCT, USA, ++]; Saxon 2003 [NRCT, USA, –]**) to suggest NRT patches (8mg/day are well tolerated in participants with mental health disorders.

Adverse events related to the use of NRT are applicable to the UK setting as there is no reason to assume that this would not be the case.

Unintended consequences

ES27.1 There is very weak evidence from one trial (**Dalack 1999 [NRCT, USA, –]**) to suggest NRT patches (22mg/day) had no detrimental effect on psychiatric symptoms in 10 in-patients with schizophrenia.

ES27.2 There is very weak evidence from one trial (**Dalack 1999 [NRCT, USA, -]**) to suggest NRT patches (22mg/day) increased abnormal involuntary movements in those who used the patch whilst still smoking in 10 in-patients with schizophrenia.

ES27.3 There is very weak evidence from one trial (**Hill 2007 [NRCT, USA, -]**) to suggest NRT patches (14mg/day) had no detrimental effect on psychiatric symptoms in 9 participants with major depression.

Unintended consequences related to the use of NRT are applicable to the UK setting as there is no reason to assume that this would not be the case.

Evidence statements – Varenicline

Effectiveness

ES10.1 There is weak evidence from four trials (**Dutra 2012 [UBA, USA, -]; Panchas 2012 [UBA, USA, -]; Smith 2009 [UBA, USA, -]; Weiner 2011a [RCT, USA, +]**) that varenicline (2mg/day), in predominately outpatients with schizophrenia or schizoaffective disorders, may reduce smoking consumption, where significant reductions were seen in expired CO levels in three studies (**Panchas 2012 [UBA, USA, -]; Smith 2009 [UBA, USA, -]; Weiner 2011a [RCT, USA, +]**); however, no significant difference was seen in continuous abstinence (bio-verified by expired CO) in one trial as compared to placebo (**Weiner 2011a [RCT, USA, +]**).

The evidence from four studies on varenicline is directly applicable to the UK setting as the intervention reflects current clinical prescribing practice in the UK for smoking cessation, and could be feasible within populations with mental health disorders. All of the four studies studies were conducted in the USA.

Adverse events

ES22.1 There is weak evidence from three trials (**Panchas 2012 [UBA, USA, -]; Smith 1999 [UBA, USA, -]; Weiner 2011a [RCT, USA, +]**) to suggest varenicline did not lead to side effects in participants with schizophrenia or schizoaffective disorders; however, side effects were common, relating to nausea and insomnia.

Adverse events related to the use of varenicline are likely to be applicable to the UK setting as there is no reason to assume that this would not be the case.

UNINTENDED CONSEQUENCES

ES28.1 There is weak evidence from four trials (**Dutra 2012 [UBA, USA, -]; Panchas 2012 [UBA, USA, -]; Smith 1999 [UBA, USA, -]; Weiner 2011a [RCT, USA, +]**) to suggest varenicline (2mg/day) had no significant detrimental effect on psychiatric symptoms, cognitive function, or suicide ideation in predominately outpatients with schizophrenia.

Unintended consequences from using varenicline are likely to be applicable to the UK setting as there is no reason to assume that this would not be the case.

EVIDENCE STATEMENTS – BUPROPION WITH NRT

EFFECTIVENESS

ES11.1 There is very weak evidence from one trial (**Saxon 2003 [NRCT, USA, -]**) to suggest the combination of bupropion (300mg/day) and NRT (21mg/day) is effective for reducing smoking consumption and expired CO levels compared to mono-therapy or no pharmacotherapy in 115 psychiatric outpatients in the short term.

ES11.2 There is moderate evidence from a pooled analysis of two trials (**George 2008 [RCT, USA, ++]; Culhane 2008 [RCT, USA, -]**) to suggest the combination of bupropion (300mg/day) and NRT (21mg/day) is effective for smoking cessation in the short term in outpatients with schizophrenia (Pooled OR 9.95, 95% CI 2.15-46.12). However, there is moderate evidence from one trial (**George 2008 [RCT, USA, ++]**) to suggest the combination of bupropion (300mg/day) and NRT (21mg/day) is not effective for smoking cessation in the long term in 59 outpatients with schizophrenia.

The evidence from the studies based on the combination treatment of bupropion with NRT is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. All of the studies were conducted in the USA.

ADVERSE EVENTS

ES23.1 There is very weak evidence from one trial (**Saxon 2003 [NRCT, USA, -]**) to suggest combination treatments of bupropion and NRT patches are well tolerated in major mental health disorders (axis I psychiatric disorders).

Adverse events related to the use of the combination of bupropion with NRT are likely to be applicable to the UK setting as there is no reason why this would not be the case.

UNINTENDED CONSEQUENCES

ES29.1 There is moderate evidence from trial (**George 2008 [RCT, USA, ++]**) to suggest the combination of bupropion (300mg/day) and NRT patches (21mg/day) had no significant effect on psychiatric symptoms in 59 outpatients with schizophrenia.

Unintended consequences from using the combination of bupropion and NRT are likely to be applicable to the UK setting as there is no reason why this would not be the case.

Evidence statement – High Intensity Behavioural Therapy with Bupropion

Effectiveness

ES12.1 There was very weak evidence from one trial (**Weiner 2001 [UBA, USA, -]**) to suggest the combination of high intensity behavioural therapy with bupropion significantly reduced smoking consumption in 9 outpatients with schizophrenia from baseline to short term follow-up (mean expired CO levels reduced from 39.4 to 18.4 ppm).

The evidence from the individual study on the combination of high intensity behavioural therapy with bupropion is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. The study was conducted in the USA.

Unintended consequences

ES30.1 There is very weak evidence (**Weiner 2001 [UBA, USA, -]**) to suggest the combination of high intensity behavioural therapy with bupropion (300mg/day) for smoking reduction has no detrimental effect depression, anxiety, or psychiatric symptoms in 9 outpatients with schizophrenia; however, some evidence of an improvement was seen for alogia.

Unintended consequences from using the combination of high intensity behavioural therapy with bupropion are likely to be applicable to the UK setting as there is no reason why this would not be the case.

Evidence statements – High Intensity Behavioural Therapy with NRT

Effectiveness

ES13.1 There is moderate evidence from one trial of 298 in-patients and outpatients with a diagnosis of non-acute psychotic disorders (**Baker 2006 [RCT, Australia, +]**) to suggest high intensity behavioural therapy (CBT with motivational interviewing) in addition to NRT (21mg/day) resulted in no significant effect on continuous smoking abstinence (bio-verified by CO<10ppm) at short (OR 2.95, 95% CI 0.83-10.53), medium (OR 2.84, 95% CI 0.48-16.67) and long (OR 5.28, 95% CI 0.31-90.20) term follow-ups.

ES13.2 There is weak evidence from two trials in participants with a diagnosis of non-acute psychotic disorders (**Baker 2006 [RCT, Australia, +]; Baker 2009 [NRCT, Australia, -]**) that high intensity (CBT with motivational interviewing) in addition to NRT (21mg/day or up to 42mg/day) reduced self-reported cigarette consumption. In one trial (**Baker 2006 [RCT, Australia, +]**) a 50% or more reduction in cigarette consumption was seen in the short (OR 3.89, 95% CI 1.9-7.89) and long (OR 2.09, 95% CI 1.03-4.27) term, but not at medium term follow-up (OR 1.88, 95% CI 0.92-3.82). In the other trial (**Baker 2009 [NRCT, Australia, -]**) a significant reduction in the number of cigarettes smoked per day was seen from baseline to short term follow-up (mean reduction from 30.8 to 17.2 cigarettes/day).

ES13.3 There is weak evidence from one trial of 322 outpatients with a diagnosis of depression (**Barnett 2008 [RCT, USA, +]**) to suggest high intensity behavioural support in addition to NRT (dose not stated) (and an offer of bupropion in those who continued to smoke) resulted in a higher proportion of participants being abstinent at long term follow-up (7 day point prevalence, bio-verified by CO<10ppm, 24.6% versus 19.1%, p value not reported).

The evidence from the studies on the combination of high intensity behavioural therapy with NRT is directly applicable to the UK setting as the intervention reflects current clinical prescribing practice in the UK for smoking cessation, and could be feasible within populations with mental health disorders. Two of the studies were conducted in Australia which has a similar smoking treatment service to the UK; the remaining study was conducted in the USA.

Unintended consequences

ES31.1 There is very weak evidence from one trial (**Baker 2009 [NRCT, Australia, –]**) to suggest the combination of high intensity behavioural therapy with NRT patches (42mg/day) had no significant effect on psychiatric symptoms or quality of life in 48 outpatients with a non-acute psychotic disorder.

ES31.2 There is weak evidence from one trial (**Baker 2006 [RCT, Australia, +]**) to suggest the combination of high intensity behavioural therapy with NRT (21mg/day) had no significant effect on psychiatric symptoms, quality of life, depression, or anxiety in 298 in-patients an outpatients with schizophrenia.

ES31.3 There is weak evidence from one trial (**Barnett 2008 [RCT, USA, +]**) to suggest the combination of high intensity behavioural therapy with NRT (dose not stated) had no significant effect on depressive symptoms in 322 outpatients with major depression.

Unintended consequences as a result of using the combination of high intensity behavioural therapy with NRT are applicable to the UK setting as there is no reason why this would not be the case.

Evidence statement – Contingency Payments with Bupropion

Effectiveness

ES14.1 There is moderate evidence from one trial (**Tidey 2011 [RCT, USA, ++]**) to suggest contingency payments given in addition to bupropion (300mg/day) did not significantly reduce smoking, or have a detrimental effect on cigarette craving, in 57 outpatients with schizophrenia.

The evidence from the individual study on the combination of contingency payments with bupropion is potentially applicable to the UK as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. The study was conducted in the USA.

UNINTENDED CONSEQUENCES

ES32.1 There is moderate evidence from one trial (**Tidey 2011 [RCT, USA, ++]**) to suggest contingency payments given in addition to bupropion (300mg/day) does not have a detrimental effect on psychiatric symptoms in 57 outpatients with schizophrenia.

Unintended consequences as a result of using the combination of contingency payments with bupropion are likely to be applicable to the UK setting as there is no reason why this would not be the case.

EVIDENCE STATEMENTS – CONTINGENCY PAYMENTS WITH NRT

EFFECTIVENESS

ES15.1 There is very weak mixed evidence from one trial of 180 outpatients with schizophrenia or schizoaffective disorders (**Gallagher 2007 [RCT, USA, -]**) regarding the effectiveness of contingency payments, given in addition to NRT (21mg/day), on abstinence compared to self-quit interventions in the short term and at medium term. Significant increases in smoking cessation were observed when abstinence was bio-verified by CO≤10ppm (short term, OR 13.73, 95% CI 3.85-49.03; medium term, OR 7.87, 95% CI 2.72-22.79). No significant effects were seen when abstinence was bio-verified by saliva cotinine<15ng/ml at short term or medium term follow-up; however, it should be noted that salivary cotinine levels are higher than a non-smokers when NRT patches are used, therefore this is not an optimal method of bio-verification in this instance.

ES15.2 There is very weak evidence from one trial of smoking reduction (**Tidey 2002 [NRCT, USA, -]**) to suggest contingency payments with NRT patches resulted in significantly reduced levels of cigarette/tobacco consumption in 17 outpatients with schizophrenia (measured using expired CO and salivary cotinine levels), but did not have an effect on the anticipation of an immediate positive outcome from smoking or on relief of nicotine withdrawal symptoms.

The evidence from the studies on the combination of contingency payments with NRT is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. Both studies were conducted in the USA.

UNINTENDED CONSEQUENCES

ES33.1 There is very weak evidence from one trial of 180 outpatients with schizophrenia or schizoaffective disorders (**Gallagher 2007 [RCT, USA, -]**) to suggest contingency payments given in addition to NRT (21mg/day) does not have detrimental effects on psychiatric symptoms in the short term and medium term.

Unintended consequences as a result of using the combination of contingency payments with NRT are likely to be applicable to the UK setting as there is no reason why this would not be the case.

ii) How effective are interventions for temporary abstinence in helping people from the populations of interest?

Evidence statement – Temporary Abstinence Interventions

ES16.1 No studies were identified which assessed the effectiveness of interventions for temporary abstinence in people with mental health illness.

- *How does the effectiveness of smoking cessation and temporary abstinence interventions vary by mental health diagnosis, gender, sexual orientation, age, ethnicity, religion, socioeconomic status, disability, and by populations of interest (including patients, household members, visitors and staff)?*

Evidence statement – Progress Plus Criteria

Effectiveness

ES17.1 No studies were identified which assessed the differential effectiveness of smoking cessation interventions by mental health diagnosis, gender, sexual orientation, ethnicity, religion, socioeconomic status, disability, or in populations of interest other than patients (for example, household members, visitors or staff).

ES17.2 There is very weak evidence from one trial (**Brown 2003 [RCT, USA, -]**) to suggest high intensity behavioural therapy with NRT had no overall significant effect on smoking cessation in 191 adolescent psychiatric in-patients at short term and long (OR 1.16, 95% CI 0.59-2.31) term outcome timings.

The evidence from the individual study on high intensity behavioural therapy in adolescents is potentially applicable to the UK as there is no reason to assume that the interventions could not be implemented in UK outpatient and in-patient settings.

- *Are there differences in the effectiveness of smoking cessation and temporary abstinence interventions by deliverer, timing (or point in the care pathway), frequency, duration, and severity of dependence, and setting in which the intervention is assessed, for example in-patients versus out-patient?*

EVIDENCE STATEMENT – TYPE OF PSYCHOTIC MEDICATION

ES18.1 There is weak evidence from one trial (**George 2000 [quasi-RCT, USA, +]**) to suggest the effectiveness of high intensity behavioural therapy for smoking cessation was not significantly related to the type of antipsychotic medication used in schizophrenia.

ES18.2 There is contradictory strong evidence from three trials (**George 2002 [RCT, USA, ++]; Evins 2005 [RCT, USA, ++]; Evins 2007 [RCT, USA, ++]**) regarding the difference in effectiveness of bupropion for smoking cessation by the type of antipsychotic medication used in schizophrenia.

The evidence from the studies is potentially applicable to the UK as the interventions are feasible within the UK setting.

iii) How effective are current strategies/approaches used by secondary care mental health services for identifying and referring people from the population of interest to stop smoking or hospital based stop smoking services?

EVIDENCE STATEMENT

ES34.1 No studies were identified which assessed the effectiveness of current strategies or approaches used by secondary care mental health services for identifying and referring people from the population of interest to stop smoking or hospital based stop smoking services.

iv) How effective are current strategies/approaches used by secondary care mental health services for identifying and providing people from the population of interest with smoking cessation information, advice and support?

EVIDENCE STATEMENTS

ES35.1 No studies were identified which assessed the effectiveness of current strategies or approaches used by secondary care mental health populations for identifying and providing people from the population of interest with smoking cessation information, advice and support.

v) Which strategies/approaches are effective in encouraging mental health care professionals to record smoking status and refer populations of interest to stop smoking services?

EVIDENCE STATEMENTS

ES36.1 No studies were identified which assessed the effectiveness of current strategies or approaches used by secondary care mental health populations for recording smoking status in the population of interest.

ES36.2 No studies were identified which assessed the effectiveness of current strategies or approaches used by secondary care mental health populations for referring populations of interest to stop smoking services.

ES36.3 There is moderate evidence from one trial of 78 outpatients with schizophrenia (**Steinberg 2004 [RCT, USA, ++]**) to suggest that a single session of motivational interviewing resulted in a higher proportion of participants seeking referral for a stop smoking service compared to psycho-educational or brief intervention.

The evidence from the individual study of high intensity behavioural therapy as an intervention to increase referral to a stop smoking service is directly applicable to the UK as the study was based on an outpatient population with mental health disorders, and the intervention is feasible in the UK setting as it is currently used for smoking cessation in the general population. The study was conducted in the USA.

DISCUSSION

This review of smoking cessation in secondary mental health services comprises of a large body of evidence. Fifty-nine studies were identified, of which 10 were based on systematic or critical review methodology, and the remaining 49 were primary evidence which were included in this review. The majority of the studies assessed the effectiveness of interventions in schizophrenia, with only a few studies assessing outcomes in different mental health populations. Most interventions assessed included behavioural therapies, bupropion, NRT, varenicline. The majority of studies were conducted in the United States, with few studies from other countries, and no studies were identified from the UK. The methodological quality of the studies was very variable, with few studies being awarded the highest quality for both internal and external validity. The majority of studies presented smoking abstinence using bio-verification of either expired CO or cotinine levels.

Overall, the evidence from the review suggested:

Behavioural therapy (with no pharmacotherapy)

Very few well conducted high quality studies have been performed to assess the effectiveness of high intensity behavioural therapy for smoking cessation or reduction. However, the evidence to date suggests high intensity behavioural therapy may be effective in populations with specific mental health disorders.

- The effectiveness of high intensity behavioural therapy in people with psychiatric disorders is mixed and mostly based on weak evidence, where an effect was seen in the short term in adults for cessation and smoking reduction, but no effect on cessation was seen in the long term in adolescents. However, there was moderate evidence that integrated tailored behavioural therapy was more effective for smoking cessation in PTSD in the short and long term, than usual standard of care (referral to a specialised smoking cessation clinic)
- There was moderate evidence to suggest high intensity behavioural therapy did not appear to be more effective for smoking cessation than lower intensity behavioural therapy in the short term in schizophrenia on cessation; however, it should be noted that in one of the studies the intensity of the behavioural therapy in the control group was relatively high
- There was moderate evidence to suggest low intensity behavioural therapy was not effective for smoking cessation or reduction in schizophrenia; however, there was very weak evidence to suggest it may be effective for smoking reduction in other psychiatric populations
- There was moderate evidence to suggest motivational interviewing may be effective in increasing the number of people with mental health disorders to seek referral for a stop smoking service compared to psycho-educational or brief intervention.

Bupropion

Several well conducted high quality studies have been performed to assess the effectiveness of bupropion for smoking cessation or reduction. The evidence to date suggests bupropion is effective for smoking cessation in the short term in populations with schizophrenia.

- There was strong evidence that bupropion was effective for increasing smoking cessation in the short term in schizophrenia, but the effect in the medium and long term is unclear
- There was moderate evidence to suggest bupropion was effective for smoking reduction in the short term in schizophrenia
- There was very weak evidence to suggest bupropion did not appear to be effective for smoking cessation in PTSD or bipolar

Nicotine replacement therapy (NRT)

Very few well conducted high quality studies have been performed to assess the effectiveness of NRT for smoking cessation or reduction. The evidence to date is mixed regarding whether NRT is effective in populations with mental health disorders.

- There was weak evidence to suggest high dose NRT may be more effective than standard dose NRT for cessation in schizophrenia

- There was mixed very weak evidence to suggest NRT regarding the effectiveness of NRT for smoking reduction or cessation in major depression or schizophrenia in the short term

VARENICLINE

No well conducted high quality studies have been performed to assess the effectiveness of varenicline for smoking cessation or reduction. The evidence to date suggests varenicline may have some effectiveness for reducing smoking.

- There was weak evidence to suggest varenicline may reduce smoking consumption, but was not effective for abstinence, in schizophrenia

OTHER PHARMACOTHERAPIES

Very few well conducted moderate to high quality studies have been performed to assess the effectiveness of other pharmacotherapies for smoking cessation or reduction. The evidence to date suggests clozapine (an atypical [new generation] antipsychotic medication) may be effective for reducing smoking.

- There was moderate evidence to suggest higher doses of clozapine (350-600mg/day) may be effective for smoking reduction, but no effect was seen for smoking cessation, in schizophrenia.
- There was very weak evidence to suggest fluoxetine did not appear to be effective for smoking reduction in major depression
- There was very weak evidence to suggest galantamine did not appear to be effective for smoking reduction in schizophrenia
- There was moderate evidence to suggest naltrexone was not effective for smoking cessation or reduction in consumption in schizophrenia

COMBINATIONS OF INTERVENTIONS

Very few well conducted high quality studies have been performed to assess the effectiveness of combinations of interventions as compared to control. The evidence to date suggests the combination of bupropion with NRT may be effective for smoking cessation.

- There was very weak evidence to suggest the combination of bupropion with NRT may be effective in reducing smoking consumption in psychiatric populations
- There was moderate evidence to suggest the combination of bupropion with NRT was effective for smoking cessation in the short term, but not in the long term, in schizophrenia
- There was very weak evidence to suggest the combination of high intensity behavioural therapy with bupropion may reduce smoking consumption in schizophrenia
- There was weak evidence to suggest the combination of high intensity behavioural therapy with NRT may be effective for reducing smoking consumption, but had no effect on cessation, in non-acute psychotic disorders or depression

CONTINGENCY PAYMENTS (WITH OR WITHOUT PHARMACOTHERAPIES)

Very few well conducted high quality studies have been performed to assess the effectiveness of contingency payment with or without pharmacotherapies for smoking cessation or reduction. The evidence to date suggests the combination of contingency payments with bupropion was effect for reducing smoking in specific mental health populations.

- There was weak evidence to suggest contingency payments may be effective for reducing smoking consumption in schizophrenia
- There was moderate evidence to suggest contingency payments with bupropion was effective on reducing smoking in schizophrenia
- There was very weak evidence to suggest contingency payments with NRT patches may be effective for a reduction in smoking consumption and smoking abstinence in schizophrenia

EFFECTIVENESS OF INTERVENTION BY TYPE OF ANTI-PSYCHOTIC MEDICATION

There were several well conducted high quality studies that have been performed to assess the difference in effectiveness of interventions for smoking cessation by the type of anti-psychotic medication used. The evidence to date is mixed regarding whether the effectiveness differs between using typical and atypical antipsychotic medication.

- There was mixed moderate evidence regarding the difference in effectiveness of high intensity behavioural therapy or bupropion for smoking cessation by the type of anti-psychotic medication used in schizophrenia.

No studies were identified which assessed:

- The effectiveness of interventions for temporary abstinence in people with mental health illness.
- The effectiveness of current strategies or approaches used by secondary care mental health services for identifying and referring people from the population of interest to stop smoking or hospital based stop smoking services.
- The effectiveness of current strategies or approaches used by secondary care mental health populations for identifying and providing people from the population of interest with smoking cessation information, advice and support.
- The effectiveness of current strategies or approaches used by secondary care mental health populations for referring populations of interest to stop smoking services.

This review highlights the urgent need for further high quality research to be performed in the areas of smoking cessation and smoking reduction in secondary care mental health service settings in the majority of the identified areas, and particularly in the UK.

ABBREVIATIONS USED

BDS/I Beck Depression Scale or Inventory

CBT Cognitive behavioural therapy

CI Confidence Interval

CO Carbon Monoxide

FTND Fagerstrom Test for Nicotine Dependence

NRCT Non-Randomised Controlled Trial

NRT Nicotine Replacement Therapy

OR Odds Ratio

PANSS Positive and Negative Symptoms scale for Schizophrenia

PPM parts per million

PTSD Post-Traumatic Stress Disorder

RCT Randomised Controlled Trial

SR Standard Release (for bupropion)

UBA Uncontrolled Before and After study

INTRODUCTION AND BACKGROUND

SIGNIFICANCE OF SMOKING FOR MENTAL HEALTH

The significance of tobacco smoking in the context of severe mental illness is substantial. Patients diagnosed with severe mental illness are up to three times more likely to be smokers than the general population, with smoking prevalence reaching figures of up to 70% for certain sub groups, such as in-patients, and patients with schizophrenia [1]. Smokers with mental illness have also been found to display patterns of heavy smoking and severe nicotine dependence [2], as well as higher nicotine and cotinine levels that are attributable to increased nicotine intake per cigarette [3]. The disproportionately high rates of smoking have been identified as causes of the increased risk of tobacco-related morbidity and excess mortality in this population (with cancers, respiratory and cardiovascular disease prevalence being high) [4], thus constituting a major contributor to health inequalities in this population. The importance of addressing the issue is increasingly being recognised and has been acknowledged in a range of seminal documents, such as the recent governmental tobacco control plan *Healthy lives, healthy people* (2011), and the mental health strategy plan *No health without mental health* (2011).

The underlying reasons for the strong relationship between smoking and mental illness are complex and vary across diagnoses. Factors contributing to increased smoking have been found to be neurobiological, psychosocial, and genetic in nature [5, 6]. Nicotine interacts with several neurotransmitter systems in the brain and mediates the release of neurotransmitters such as dopamine, noradrenaline and serotonin, which affect mood, cognitive functioning, attention, and memory. Self-medication for and self-regulation of symptoms of mental illness has therefore been proposed as a potential explanation for frequent and heavy smoking among individuals with mental illness [4]. It has also been emphasised that smoking often constitutes a means of social interaction, reducing social inhibition and isolation frequently encountered in this population [5]. Smoking is also relevant from a clinical perspective, as hydrocarbon agents in tobacco smoke induce liver enzymes responsible for drug clearance, thus affecting drug levels of antipsychotic medication. Patients who smoke consequently require higher doses of medication, as their drug metabolism is accelerated by smoking. Hence, tobacco abstinence or quitting requires monitoring of blood levels of medications such as clozapine, as decelerated clearance can potentially lead to toxicity [6].

SMOKING IN MENTAL HEALTH SETTINGS: SYSTEMIC ISSUES

Despite the complexities that mark smoking as a matter of particular importance in the context of mental illness, tobacco dependence constitutes a largely neglected issue in mental health settings, with smoking being historically deeply embedded in the culture of treatment environments [7], and clinicians being reluctant to address the issue proactively as an integral part of treatment [8]. While a societal change towards reducing smoking and the exposure to tobacco smoke in public and work places has taken place in the UK over recent years, smoking is still largely condoned across psychiatric settings, and many mental health professionals perceive it as an important coping mechanism for patients [9]. Smoking has, furthermore, transpired to be a frequently used means of reward or punishment in achieving compliance with treatment, and to play an important part in the context of social interaction between patients and staff [10]. Of particular importance in this context

is the smokefree policy that has been implemented in mental health settings in July 2008. Whilst this is a potential avenue towards health protection and promotion in a vulnerable population, it has since been shown that there is cause for concern, as policies appear to be implemented incoherently, with smoking still being facilitated on a regular basis and viewed as the norm rather than the exception [11]. Furthermore, striking deficiencies in clinical staff knowledge with regard to smoking and its links with mental illness, including metabolic interactions with medication and use of pharmacotherapy for smoking cessation, have been identified, which arguably pose challenges to the appropriate support of patient smokers admitted to treatment environments in which their smoking behaviour is likely to change [12].

TREATMENT OF SMOKING PATIENTS WITH SEVERE MENTAL ILLNESS

Contrary to common perception, patients with severe mental illness are frequently willing to quit smoking [13] provided they receive tailored support, though success in quitting appears to be only half of that in the general population [14], and relapse rates are higher [7]. Pharmacological treatment with both NRT and bupropion (the most recent pharmacological treatment, varenicline, is currently being trialed for safety in the psychiatric population), given separately or in combination, has proven effective and well-tolerated in psychiatric populations [15]. Additional cognitive behavioural support in groups, which has been shown to have potentially beneficial outcomes on quitting attempts in the normal population [16], has been integrated into tailored behavioural programmes for patients with severe mental illness successfully [17]. As many mental health patients are severely dependent on tobacco, and typically experience changing levels of motivation to stop smoking depending on their perceived ability to address their addiction in the light of mental resources, it has been proposed that in this population, smoking reduction may be a viable route towards harm reduction and eventual abstinence [18].

However, clear guidance with regard to treatment models, including the integration of tobacco dependence treatment in care pathways and consideration of smokefree policy implementation in treatment settings, is to date missing. In view of the importance of the issue from public health, clinical, economic, sociological, and policy perspectives, this is a shortcoming that should urgently be addressed.

AIM OF THE REVIEW

To assess the effectiveness of smoking cessation and temporary abstinence interventions in mental health services, including strategies for referring people to stop smoking or hospital based stop smoking services, for the populations of interest.

RESEARCH QUESTIONS ADDRESSED

The review will address the following key research questions:

i) How effective are smoking cessation interventions in helping people from the populations of interest?

ii) How effective are interventions for temporary abstinence in helping people from the populations of interest?

iii) How effective are current strategies/approaches used by secondary care mental health services for identifying and referring people from the population of interest to stop smoking or hospital based stop smoking services?

iv) How effective are current strategies/approaches used by secondary care mental health services for identifying and providing people from the population of interest with smoking cessation information, advice and support?

v) Which strategies/approaches are effective in encouraging mental health care professionals to record smoking status and refer populations of interest to stop smoking services?

Subsidiary questions include:

- *How does the effectiveness of smoking cessation and temporary abstinence interventions vary by mental health diagnosis, gender, sexual orientation, age, ethnicity, religion, socioeconomic status, disability, and by populations of interest (including patients, household members, visitors and staff)?*
- *Are there differences in the effectiveness of smoking cessation and temporary abstinence interventions by deliverer, timing (or point in the care pathway), frequency, duration, and severity of dependence, and setting in which the intervention is assessed, for example in-patients versus out-patient?*
- *What are the adverse events and other consequences associated with using smoking cessation and temporary abstinence interventions in the populations of interest?*

METHODS

INCLUSION AND EXCLUSION CRITERIA

TYPES OF STUDY DESIGNS

We included reviews of reviews, systematic reviews and guidelines (including NICE guidelines), randomised controlled trials, and non-randomised controlled trials. Controlled before and after studies, interrupted time series and uncontrolled before and after studies were also considered for potential relevance.

TYPES OF PARTICIPANTS

We considered studies which include the following populations of interest of any age who smoke:

- All users of secondary care mental health services, including those who are in the process of being referred to or have recently been discharged from child, adolescent, adult or older people mental health services:
  - In-patient, residential and long-term care for severe mental illness in hospitals, psychiatric and specialist units and secure hospitals
  - Patients who are within the care of specialist community-based multidisciplinary mental health teams
- People living in the same household as a mental health service user, such as partners, parents, other family members and carers
- Visitors to secondary care mental health setting who are not receiving treatment or care, such as relatives or friends of patients or service users
- Staff (including support staff, volunteers, agency/locum staff and staff employed by contractors) working in secondary care mental health settings, in particular those who have direct contact with patients and service users

We did not consider users of primary care services, users of secondary care services other than mental health services; and their parents, carers and other family members; staff working in, and visitors to, secondary care services other than mental health.

TYPES OF INTERVENTIONS

ACTIVE INTERVENTIONS:

We included any pharmacological, psychological, behavioural, or self-help intervention that aims to assist with smoking cessation or temporary abstinence. Interventions of relevance included pharmacological interventions, administered alone or in combination with other interventions; psychological interventions, including behavioural support, counselling and advice (with and without a pharmacological intervention); self-help approaches to smoking cessation or temporary abstinence without additional support. Behavioural therapy was categorised into high or low intensity as defined empirically by the included studies; with high intensity therapies typically involving at least

30 minutes of face-to-face contact if only one session was delivered, or at least 20 minutes of face-to-face contact where more than one session was delivered. Psychological and behavioural interventions could include concomitant use of pharmacological interventions to assist with cessation prior to the target quit date; however, in this case, use of pharmacological interventions needed to be equivalent in the active and comparator groups before and after cessation. Similarly, pharmacological interventions could include psychological or behavioural interventions; however, in this case, the type and intensity of support needed to be comparable between the active and comparator groups. Pharmacological interventions not currently licensed for temporary abstinence were also eligible for inclusion. We included any strategies, protocols or systems used by relevant health professionals to help identify smokers, record advice given and refer them to services, alone and share information between different groups of health professionals and across the care pathway.

COMPARATORS:

We included comparisons of interventions with each other (administered alone or in combination), placebo or usual care. Self-help interventions were compared to not using a self-help intervention. Approaches to improve identification, recording of advice and referrals were compared with usual care.

TYPES OF OUTCOME MEASURES

Primary outcomes of interest included the proportion of participants who made successful quit attempts; changes in mean biochemically validated levels of smoking from baseline; and self-reported cigarette consumption. Where studies presented more than one type of abstinence measure, we used prolonged or continuous abstinence in preference to point prevalence abstinence. Additionally, we used biochemical validated abstinence (such as exhaled carbon monoxide or saliva cotinine levels) in preference to self-reported abstinence, where data were available. We included studies which report the follow-up within 10 years of the completion on the intervention.

Other outcomes included an assessment of current strategies using the number of referrals to and contacts with stop smoking services; a comparison of the number of smoking cessation referrals between mental health care and other settings; assessments of improvement in health (for example, recovery rates); changes in recording or referral procedures or care pathway development, following targeted interventions to support the implementation of tobacco treatment services in mental health settings.

Further outcomes of interest included measures of self-efficacy, nicotine dependence and withdrawal, motivation, confidence, where these were reported in addition to assessing smoking cessation ascertained as described above. We additionally assessed the proportion of populations of interest with adverse events.

EXCLUSION CRITERIA

We did not consider smoking cessation or temporary abstinence interventions in primary care, medical and surgical care or obstetric care. We also did not consider policy or legislative interventions, or interventions aimed at preventing of uptake of tobacco use. We additionally excluded studies assessing the effectiveness of interventions in substance abuse (drug and alcohol).

SEARCH STRATEGY

Sensitive search strategies were developed by an information specialist in conjunction with the research team and peer-reviewed by information specialists at NICE using a combination of controlled vocabulary and free-text terms. The search strategy was initially developed in MEDLINE and was then adapted to meet the syntax and character restrictions of each included database.

The ICD-10 Classification of Mental health and Behavioural Disorders diagnostic criteria was used to refine the populations of interest to aid with searching for relevant disorders. The search strategy focused on the following ICD-10 diagnoses, for each of which we developed detailed search terms as demonstrated in the example of the search strategy:

F00-F09	Organic, including symptomatic, mental disorders
F10-F19	Mental and behavioural disorders due to psychoactive substance use
F20-F29	Schizophrenia, schizotypal and delusional disorders
F30-F39	Mood (affective) disorders
F40-F48	Neurotic, stress-related and somatoform disorders
F50	Eating disorders
F60-F62	Specific personality disorders, Mixed and other personality disorders, Enduring personality changes
F84	Pervasive developmental disorders
F90-F92	Hyperkinetic disorder, Conduct disorder, Mixed disorders of conduct and emotions

In our judgement, the search for specific terms related to the following diagnoses would not yield meaningful outcomes (owing to the fact that the respective populations are highly unlikely to constitute target groups of tobacco related research), therefore we did not to develop detailed search terms for those, but to imply inclusion of these groups through the identification of studies that include populations of 'smokers treated in mental health settings' more generically.

F51-F59 The excluded syndromes refer to nonorganic sleep disorders, sexual dysfunction (not caused by organic disorder or disease), mental and behavioural disorders associated with the puerperium, and abuse of non-dependence-producing substances

F63-F69 The excluded disorders refer to habit and impulse disorders, gender identity disorders, disorders of sexual preference, and psychological and behavioural disorders associated with sexual development and orientation

F70-F79 The excluded diagnoses refer to mental retardation

F80-F89 The excluded disorders refer to specific developmental disorders of speech and language, scholastic skills, motor function (excluding F84)

F93-F99 The excluded disorders refer to emotional disorders, social functioning, nonorganic enuresis and nonorganic encopresis with onsets specific to childhood, and tic disorders

Literature searches were conducted from 1985 onwards. The full search strategies for each database source can be found in Appendix 1. The following databases were searched:

- AMED (Allied and Complementary Medicine)
- ASSIA (Applied Social Science Index and Abstracts)
- British Nursing Index
- CDC Smoking & Health Resource Library database
- CINAHL (Cumulative Index of Nursing and Allied Health Literature)
- Cochrane Central Register of Controlled Trials
- Cochrane Database of Systematic Reviews (CDSR)
- Cochrane Tobacco Addiction group Specialist Register
- Conference Papers Index (years: 2008-2012)
- Database of Abstracts of Reviews of Effectiveness (DARE; 'other reviews' in CDSR database)
- Database of Promoting Health Effectiveness Reviews (EPPI Centre DoPHER)
- EMBASE
- Health Evidence Canada
- Health Technology Assessment (HTA) database in the CDSR database
- HMIC
- International Bibliography of Social Sciences
- Medline, including Medline in Process
- PsycINFO
- Social Policy and Practice
- Social Science Citation Index and Conference Proceedings Citation Index
- Sociological Abstracts
- Trials Register of Promoting Health Interventions (EPPI Centre TRoPHI)
- UK Clinical Research Network Portfolio Database

The following websites were also searched for research papers relevant to the review questions:

- Smoke free http://smokefree.nhs.uk
- NHS Centre for Smoking Cessation and Training http://www.ncsct.co.uk/
- Action on Smoking and Health (ASH) http://www.ash.org.uk
- Treat tobacco.net http://www.treatobacco.net/en/index.php
- Society for Research on Nicotine and Tobacco http://www.srnt.org
- International Union against Cancer http://www.uicc.org
- WHO Tobacco Free Initiative (TIF) http://www.who.int/tobacco/en
- International Tobacco Control Policy Evaluation Project http://www.itcproject.org
- Tobacco Harm Reduction http://www.tobaccoharmreduction.org/index.htm
- Current controlled trials www.controlled-trials.com
- Association for the treatment of tobacco use and dependence (ATTUD) www.attud.org
- National Institute on drug abuse- the science of drug abuse and addiction http://www.nida.nih.gov/nidahome.html
- NICE http://www.nice.org.uk/
- Public health observatories http://www.apho.org.uk/resource/advanced.aspx
- Scottish Government http://www.scotland.gov.uk/topics/research
- Welsh Assembly Government http://wales.gov.uk/
- NHS Evidence https://www.evidence.nhs.uk/
- Joseph Rowntree Foundation http://www.jrf.org.uk/publications
- UK Centre for Tobacco Control Studies http://www.ukctcs.org/ukctcs/index.aspx

We electronically searched the World Conference on Tobacco or Health proceedings in years 2006, 2009 and 2012 (the conference is held every three years) to identify further potentially eligible papers, as this conference is not included in the databases and websites above. We also checked reference lists of included previous reviews to identify further potentially eligible studies. Additionally, we screened the electronic files of papers identified from Reviews 1, 2, 3, 6, and 7 for studies that had potential relevance.

Studies were managed during the review using the EPPI-Centre's online review software EPPI-Reviewer (version 4.0).

TITLE AND ABSTRACT SCREENING

All records from the searches were uploaded into a database and duplicate records were removed. Where no abstract was available, a web search was first undertaken to locate one; if no abstract could be found, records were screened on title alone and full-text documents were retrieved where there was any doubt.

To trial the inclusion criteria, a pilot round of screening was conducted on a random selection of 30 document titles and abstracts. Piloting was conducted by three reviewers. A reconciliation meeting was then held to discuss disagreements and suggest changes to the inclusion criteria.

Following the pilot screening, 1,143 records (10%) were double screened. The inter-rater agreement rate for double-screening was 97.7%, which was considered by the project team and NICE to be sufficiently high. As such, the remaining documents were split between two reviewers who independently screened their allocated records. Of the double-screened items, any disagreements were resolved by a third reviewer. Throughout the entire process, the reviewers discussed difficult and ambiguous records to ensure consistency.

The final inclusion criteria are presented below (also see Appendix 2 for detailed guidance and definitions used for each criterion). The criteria were applied in a hierarchical fashion.

- The document must be published during or after 1985
- The document must report on a piece of empirical research
- The title and/or abstract must refer to smoking cessation interventions/ services
- The study (or a component of it) must be conducted in a mental health secondary care setting, or include patients or workers in mental health services, or family/friends/visitors of mental health patients.
- The study design must involve a comparison (e.g., controlled trials, before-and-after) and/or views or process evaluation (e.g., interviews, surveys)

If the study met the above criteria and evaluated the effectiveness of an intervention, it was marked as relevant to Review 4. If the study met the above criteria and included evidence on barriers or facilitators (including knowledge, attitudes and beliefs) of using or implementing smoking cessation interventions/ services, it was marked as relevant to Review 5.

Full text screening

Once all of the titles and abstracts were screened, the full-text documents were retrieved for those records marked for inclusion. The retrieved documents were then re-screened on the basis of the detail available in the full-text article by Ms Jayes using a previously piloted screening checklist (Appendix 3). A random selection of a minimum of 30% of the full-text documents was double-screened by the Ms Jayes and Dr Leonardi-Bee. The first 134 articles were double screened based on full text, and we reviewers agreed on 94%, which was deemed sufficiently high. Any disagreements

were discussed and, if necessary, resolved by Dr Ratschen. Those documents that passed the inclusion criteria on the basis of the full-text screening were included in the review.

Data extraction and quality assessment

Data extraction and appraisal of the quality of the included studies was performed by Dr Leonardi-Bee, with a random selection of 10% being double-assessed by Professor McNeill. Data were extracted using previously piloted data extraction forms which followed the methods as outlined in the methods manual www.nice.org.uk/phmethods2009, and PROGRESS-Plus criteria (age, sex, sexual orientation, disability, ethnicity, religion, place of residence, occupation, education, socioeconomic position and social capital) was noted. Any difference in assignment of quality was resolved through discussion. Internal and external validity of the studies was rated using the previously piloted quality appraisal checklists which followed the methods as outlines in the methods manual, with each study being coded as either ++, +, or -. ++ indicated a high quality score for internal and external validity, where the study demonstrated all or most of the checklist criteria had been fulfilled, and where these had not been fulfilled, the conclusions of the study were unlikely to alter, had this been the case. + indicated moderate quality for internal and external validity, where the study demonstrated some of the checklist criteria had been fulfilled, and where they had not been fulfilled, or not adequately described, the conclusions of the study were unlikely to alter. – indicated a low quality score for internal and external validity, where the study demonstrated few or none of the checklist criteria had been fulfilled and the conclusions of the study were likely or very likely to alter, had this been the case. Composite inter-rater agreement (the per cent agreement) was calculated and reported.

Data synthesis

The results from the studies were expressed as odds ratios (OR) with 95% confidence intervals (CI) for dichotomous outcomes; or as mean differences (MD) with 95% CIs for continuous outcomes. Where raw data were extracted which contained zero cells, to enable estimation of odds ratios, 1 was added to each cell of the 2x2 table. Where possible, we performed random effects meta-analysis to estimate weighted intervention effects across studies, and presented results using forest plots. For psychological interventions, we anticipated using technique-based meta-regression methods to classify interventions into component techniques; however, due to insufficient number of comparable studies this was not performed. Where there were insufficient studies to perform a meta-analysis, studies were described individually.

Timing of outcome measures

The timing of the follow-ups were grouped into categories to reflect the impact of the intervention at different time points; temporary (during a stay or visit at a mental health care setting), short term (outcome closest to 1 month, permitted range 1-5 months), medium term (outcome closest to 6 months, permitted range 6-11 months), long term (outcome closest to 12 months, permitted range 12-23 months), and elongated terms (outcome closest to 5 years, permitted range 2 to 10 years).

ASSESSMENT OF HETEROGENEITY

Statistical heterogeneity was quantified using recognised methods (I^2).

ANALYSES TO EXPLORE REASONS FOR HETEROGENEITY

We anticipated using subgroup and sensitivity analyses and meta-regression to explore heterogeneity, for example based on class of pharmacological intervention, methodological quality, study design, length of the intervention, type and intensity of psychological intervention, measure of abstinence and validation of abstinence; but insufficient numbers of comparable studies were included in the review, thus further analysis was not permissible.

We anticipated using further subgroup analysis to assess the impact of the interventions on the gender, sexual orientation, age, ethnicity, religion, socioeconomic status, mental health diagnosis, disability, and population of interest (including patients, household members, visitors and staff); and whether the intervention varied by deliverer, timing (or point in the care pathway), frequency, duration, and severity of dependence, and setting in which the intervention was assessed, for example in-patients versus out-patient, however, this assessment was limited due to insufficient number of comparable studies.

METHODS FOR DEALING WITH MISSING DATA

Where participant drop-out lead to missing outcome data, we attempted to perform an intention-to-treat analysis using the Russell Standard.

ASSESSMENTS OF PUBLICATION BIAS

Due to insufficient numbers of comparable studies we were unable to perform funnel plots to assess publication bias (small study bias).

ADVERSE EVENT OUTCOMES

Data relating to adverse events were described qualitatively.

SOFTWARE

Data were analysed using Review Manager (version 5.1).

EVIDENCE TABLES

Evidence tables were completed for each included study.

EVIDENCE STATEMENTS

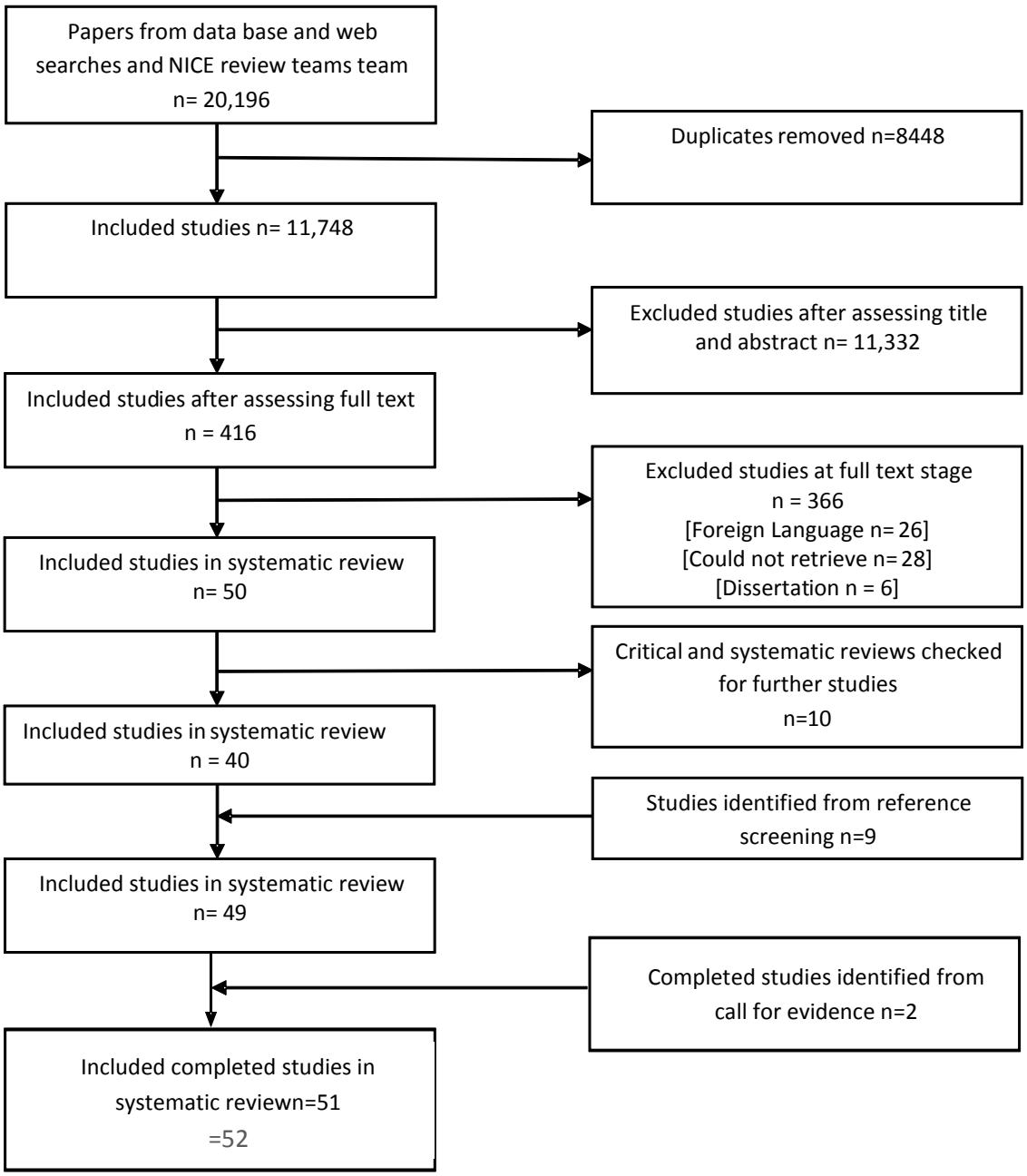
Evidence statements based on an aggregated summary of the available evidence were produced, which reflected the strength (quality, quantity and consistency) of the evidence and statements regarding its applicability were made. The quality of the evidence was categorised as strong (where statements were based on evidence from several high quality studies), moderate (where statements were based on evidence from either one high study, or a mixture of high and lower quality studies), weak (where statements were based on evidence from lower quality studies), or very weak (where statements were based on evidence from individual lower quality studies). Statements were also made where there is a lack of evidence. Statements regarding the applicability of the evidence to the UK setting were also reported and categorised as directly applicable, potentially applicable, or not applicable.

RESULTS

OVERVIEW OF RESULTS FROM SEARCH

20,196 references were identified from the search strategy, comprising of 20,058 references from the databases searched, 35 references located through web searches, and 103 references located through other NICE review teams. Following removal of 8,448 references due to duplication, a total of 11,748 references were screened based on their title and abstract. Of these, 11,332 references were deemed not eligible for inclusion, thus a total of 416 were screened based on their full text. We excluded a total of 366 of the full-text papers with the majority being excluded due to not fulfilling the inclusion criteria; however 26 of these were excluded due to translations not being available, 6 due to the dissertation not being available and 28 due to the full text paper being irretrievable. 10 papers were excluded from the review due to being systematic reviews or critical reviews; however, the reference lists of these reviews were screened for further studies. Additionally, we identified a further 9 eligible papers from reference scanning of identified reviews. A high inter-rater agreement rate of 83% was found between the reviewer based on data extraction and quality assessment. Following the call for evidence, we identified two further studies assessing varenicline for smoking cessation in patients with schizophrenia, and one ongoing randomised placebo-controlled multicenter trial assessing the safety and efficacy of 1mg varenicline (twice per day) given for 12 weeks for smoking cessation in 525 adult smokers with either a current or past diagnosis of major depressive disorder without psychotic features (ClinicalTrials.gov identifier: NCT01078298, sponsor Pfizer). The study was due to complete in June 2012; however, no findings from this study have been presented or published yet. Thus a total of 51 completed studies were deemed eligible for inclusion into the review (Figure 1).

Figure 1 **Flow chart of study selection**



Overview of systematic studies identified from the search

Ten studies identified from the searches used a systematic or critical review methodology (Appendix 4), with the majority of these focusing on interventions for smoking cessation in people with schizophrenia (Bradshaw 2005, Ferron 2009, Tsio 2010a, Tsio 2010b, El-Guebaly 2002, Kisely 2008). Three focused on depression and mood disorders (El-Guebaly 2002, Hitsman 2003, Kisely 2008), and four focused on any non-organic psychiatric disorders and other disorders (Banham 2010, Heckman 2010, Bryant 2011, Kisely 2008). A summary of the reviews are presented in Appendix 5. However, because the reviews were published several years ago, and the papers included in the reviews were also identified from the search strategy, we elected to focus on presenting evidence from individual studies rather than the summarised findings from the reviews. Thus, the reviews below are not presented using evidence tables.

Overview of primary evidence studies included in the review

A total of 51 primary studies were included in the review (Appendix 6), with the majority focusing on interventions for smoking cessation in people with schizophrenia. The remaining studies assessed interventions for smoking cessation in people with post-traumatic stress disorder (PTSD) (3 studies), bipolar (1 study), major depression (4 studies), or encompassed a range of mental health disorders (10 studies).

Settings of the studies

The majority of the included studies were conducted in outpatient (community) mental health populations (32 studies), with only 10 conducted in in-patients mental health populations and three conducted in both in-patient and outpatients. Six further studies were unclear with regard to their populations. Most of the studies recruited participants directly from the users of particular outpatient or in-patient mental health care clinics. The majority of the included studies were conducted in the United States (41 studies), with only a small number being conducted elsewhere in the world (Australia [3 studies], Canada [1 study], China [2 studies], Iran [1 study], Israel [1 study], Poland [1 study], and Taiwan [1 study]). The sample sizes of the included studies varied from 5 to 943. One study failed to report the sample size of the two RCTs included in the report (Culhane 2008).

Interventions assessed

A wide range of single interventions and combinations of interventions for smoking cessation were assessed within the studies, and included behavioural and pharmacotherapies given singularly or in combination. The most commonly used interventions for the smoking cessation trials were behavioural therapy (high intensity, 11 studies; low intensity, 2 studies), nicotine replacement therapy (6 studies), bupropion (10 studies), clozapine (3 studies), or NRT with behavioural therapy (3 studies), combination of NRT with bupropion (3 studies), and four studies were identified which assessed the effectiveness of varenicline. Individual studies assessed the effectiveness of contingency payments; fluoxetine, galantamine, naltrexone, contingency payments with bupropion, contingency payments with NRT. The interventions assessed for smoking reduction were bupropion

(1 study), bupropion with behavioural therapy (1 study), and contingency payment with NRT (1 study).

DESIGNS OF THE STUDIES

The majority of studies used a parallel group RCT design (35 studies); however, a small number of studies used designs based on a quasi-randomised trial (2 studies); a non-randomised trial (2 studies), cross-over design trial (4 studies), randomised before and after trial (1 study), or a non-randomised before and after trial (6 studies), or described the study as an interrupted time series design (1 study, this study appeared to be a RCT from the methods section of the paper).

OUTCOMES ASSESSED

All of the included studies assessed smoking cessation as self-reported quit, with most bio-verification of smoking status either using expired CO, and/or saliva and/or urinary cotinine levels. However, different cut-off levels were used in the studies to determine bio-verified cessation; with the majority using an expired CO level ≤10ppm, whilst others commonly used ≤8ppm. Most of the successful quit attempts were assessed either short term (1-5 months post quit date) or medium term (6-11 months post quit date), with few assessing long term (12-23 months post quit date), and none assessing elongated term (2-10 years post quit date). A few studies reported temporary smoking status (during a stay or visit at a mental health care setting).

One study assessed the effectiveness of interventions for referring the population of interest to a stop smoking or hospital based stop smoking service. None of the studies included in the review assessed the effectiveness of current strategies used by secondary care mental health services for identifying, documenting smoking status and advice given, or the effectiveness of integrating smoking cessation support within care pathways to provide collaborative services across community, primary, mental health care providers. However, information on the barriers and facilitators affecting these outcomes are presented in the Barriers and Facilitators review (R5).

Other outcome measures assessed and included were the number of cigarettes smoked per day, either collected using self-report or the study researcher counting the number of cigarette butts. A wide range of treatment-related outcomes were assessed and included psychiatric symptoms, anxiety, depression, cognitive function, and quality of life measures.

QUALITY ASSESSMENT

The overall quality of the included studies varied, with 10 (20%) and 12 (24%) being awarded the highest quality score for internal and external validity, respectively; which indicated that the study demonstrated all or most of the checklist criteria had been fulfilled, and where these had not been fulfilled, the conclusions of the study were unlikely to alter, had this been the case. 18 (35%) and 26 (51%) were awarded medium quality score for internal and external validity, respectively; which indicated that the study demonstrated some of the checklist criteria had been fulfilled, and where they had not been fulfilled, or not adequately described, the conclusion of the study were unlikely to alter. Finally, 23 (45%) and 13 (25%) were awarded the lowest quality score for internal and external

validity, respectively; which indicated that few or none of the checklist criteria had been fulfilled and the conclusions of the study were likely or very likely to alter, had this been the case.

QUESTION 1A. HOW EFFECTIVE ARE SMOKING CESSATION INTERVENTIONS IN HELPING PEOPLE FROM THE POPULATION OF INTEREST?

46 primary studies were identified and included in the review which addressed this question. These studies are summarised in details in the evidence tables in Appendix 7. The findings from these studies are presented below and structured based on the type of intervention assessed, followed by the population of interest. The study design, country and internal validity quality score for each study is presented in parentheses following the citation.

BEHAVIOURAL THERAPY INTERVENTIONS

HIGH INTENSITY BEHAVIOURAL THERAPY INTERVENTIONS

Brown 2003 (RCT, USA, +) A RCT was conducted that assessed the effectiveness of motivational interviewing in 191 psychiatric in-patients aged 13-17 years who smoked at least one cigarette per week. Eligible diagnoses included mood (n=84), anxiety (n=105), disruptive behaviour (n=150), and substance related (n=136) disorders (participants could have dual disorders); however, participants with current psychotic disorders were excluded. Participants were randomised to motivational interviewing or brief advice. The motivational interviewing group received two 45-minute individual therapy sessions during hospitalisation, and following discharge they were offered NRT patches if they desired to quit smoking and smoked 10+ cigarettes per day. The brief advice group received 5-10 minutes of smoking cessation advice by the study therapist and a self-help pamphlet, and following discharge they were also offered NRT patches if they desired to quit and smoked 10+ cigarettes per day.

SMOKING CESSATION OUTCOMES

The study demonstrated no significant difference between the treatment groups on the number of cigarettes smoked per day at 12 months follow-up (p=0.74). Additionally, 7 day point prevalence (bio-verified with expired CO<10ppm and saliva cotinine<15ng/ml) was not significantly difference at one month (11.0% versus 11.0%), 6 months (13.3% versus 8.5%), or 12 months (14.0% versus 9.9%) follow-up (all p>0.30). Over the 12 month follow-up, no significant difference was seen in the odds of abstinence between the treatment groups (OR 1.16, 95% CI 0.59-2.31; p=0.38); however, the study reported having an anxiety disorder was associated with a higher odds of abstinence (OR 4.71, 95% CI 2.19-10.12; p=0.0001). On discharge, participants in the motivational interviewing group had significantly higher self-efficacy (confidence in ability to refrain from smoking) compared to those receiving brief advice (p=0.04).

Currie 2008 (quasi-RCT, Canada, +) A quasi-RCT was conducted which compared the effectiveness of 8 sessions of a smoking cessation programme as compared to only using 4 sessions in 85 out-patients participants with severe and persistent mental illness who had an interest in

quitting smoking. Both treatment groups used the same smoking cessation programme which was based on popular treatment protocol "Freedom from smoking" particularly tailored for persons with mental illness; participants were randomised to receive either the 4 session version or the 8 session version. The target quit dates was session 3 for the 4 session version, and session 4 for the 8 session version. All participants were encouraged to use NRT gum or patches.

SMOKING CESSATION OUTCOMES

The study reported 7 day point prevalence abstinence, bio-verified by expired CO, was higher in the 8 session version than the 4 session version at each time points (post-treatment, 13% versus 21%; 3 months, 15% versus 24%; 6 months, 8% versus 29%; 12 months, 21% versus 27%; no p values could be determined for the comparisons). Additionally, the study reported post-treatment 7 day point prevalence was higher in makes than females (69% versus 31%, p<0.01).

Kisely 2003 (NRCT, Australia, -) A non-randomised cross-over design study was conducted to assess the effectiveness of behavioural group therapy as compared to no intervention in an outpatient mental health population who were asked to set initial and long term goals for smoking reduction and cessation. Following baseline measurements, all participants initially received a control phase of no intervention for 8 weeks while they were on a waiting list. The intervention phase was then conducted over the next 8 weeks, which comprised of 8 weekly 1.5 hour sessions, where the intervention was conducted by a psychologist and an additional facilitator as needed. The content of the early sessions focused on developing knowledge and motivation surrounding the positive and negative effects of smoking, including short and long term benefits of stopping; with subsequent sessions covering different methods for stopping, dealing with difficult situations, relapse prevention and a smoke-free lifestyle, using CBT methods. Thirty-eight participants were recruited who had a range of mental health outcomes including schizophrenia (n=17), mood disorders (n=16), organic mental health disorder (n=4) or personality disorder (n=1).

SMOKING CESSATION OUTCOMES

The findings from the study demonstrated smoking at 8 weeks follow up, ascertained using case notes, was significantly more likely at the end of the control period than at the end of the intervention period (control, 19/19 versus intervention, 14/19; p=0.02). Half of the participants (n=10) from the cross-over trial were followed-up to three months, at which only 3 participants continued to smoke (p<0.05). The study also demonstrated at the end of the 8 weeks intervention period as compared to the control period significantly lower cotinine levels (p=0.046) and significantly lower FTND scores (p=0.002).

Morris 2011 (RCT, USA, +) A randomised controlled pilot trial was conducted to assess the effectiveness of a tobacco cessation group in addition to a quit-line service in 123 outpatients with psychiatric diagnoses who were interested in quitting regardless of their motivational readiness to quit. Participants were randomised to receive up to 10 sessions of a community based tobacco cessation group facilitated by mental health clinicians with group therapy experience in addition to a

quit-line service, or the quit-line service only. The quit-line service comprised of 5 proactive telephone calls to assist with quitting, promote healthier lifestyles and prevent relapse. All participants were entitled to up to 12 weeks of free NRT patches (21mg/day for weeks 1-6, 14mg/day for weeks 7-8, 7mg/day for weeks 9-12); however, no information was given in the paper regarding usage. The quit-line was facilitated by counsellors who were trained to assist participants with psychiatric disorders.

SMOKING CESSATION OUTCOMES

The study demonstrated participants who had received the group therapy in addition to the quit-line were significantly more likely to achieve 50% reduction in the self-reported number of cigarettes smoked per day at 6 months compared to those who solely received the quit-line (21% versus 8%; Adjusted OR 3.16, 95% CI 1.04-9.65; p=0.045).

McFall 2005 (RCT, USA, +) A RCT was conducted to assess the effectiveness of integrated care in 66 outpatients under treatment for PTSD. Participants were randomised to integrated care or usual standard of care. The integrated care comprised of 5 individual behavioural counselling sessions once a week on a weekly basis (lasting approximately 20 minutes each) and one follow-up contact. The counselling components included education about the health risks of smoking and the benefits of quitting, motivational interventions, coping strategies, and self-help reading materials. The counselling was administered by PTSD clinic prescribers and case managers. The control group received usual standard of care in which they were referred to a smoking cessation clinic, where the participant could attend one group orientation class, followed by individual sessions in which they received medications and behavioural counselling. All participants included in the trial could access the usual standard of care offered to the control group. However, the participants in the control group received no tobacco-cessation interventions from their PTSD clinic providers.

SMOKING CESSATION OUTCOMES

This study demonstrated at each assessment time (2, 4, 6 and 9 months follow-up), participants receiving integrated care were significantly more likely to be abstinent (7 day point prevalence) compared to participants receiving standard care (OR 5.23, 95% CI 1.76 to 15.54; p<0.002).

McFall 2010 (RCT, USA, ++) A RCT was conducted to assess the effectiveness of integrated care in 943 outpatients under PTSD care. All participants had PTSD related to military service. Participants were randomised to integrated care or usual standard of care. The integrated care comprised of 5 weekly individual tobacco cessation therapy sessions which focused on tobacco use education, behavioural skills for quitting, and relapse prevention. These core sessions were then followed by three follow-up visits for those who continued to smoke, and booster sessions could be administered monthly if needed. The control group received usual standard of care in which they were referred to a specialised cessation clinic, and treatment was received within 6 weeks of the referral and smoking cessation medication were prescribed either directly by the clinic staff or through the participant's general practitioner.

SMOKING CESSATION OUTCOMES

The study demonstrated bio-verified point prevalence at 6 months follow-up was significantly higher in the integrated care group compared to the usual standard care group (7 day point prevalence, 78/472 versus 34/471, p<0.001; 30 day point prevalence, 65/472 versus 28/471, p=0.001). Self-reported prolonged abstinence bio-verified by expired CO at 12 months follow-up was significantly more likely in the integrated care group compared to the usual standard care group (Adjusted OR 2.26, 95% CI 1.30 – 3.91). The treatment effect was reported to be consistent across all subgroups considered. At 18 months follow-up, bio-verified point prevalence abstinence was significantly more likely in the integrated care group compared to the usual standard care group (7 day point prevalence, 86/472 versus 51/471, p<0.001; 30 day point prevalence, 80/472 versus 44/471, p<0.001).

Chen 2002 (RCT, China, -) A RCT was conducted to assess the effectiveness of a high intensity behavioural therapy programmes on changes in health beliefs of smoking cessation in 65 outpatients diagnosed with schizophrenia or schizoaffective disorders. Participants were randomised to either a closed smoking cessation programme, consisting of 2 sessions per week for 4 weeks (duration of 1 hour each), or a control group which received no intervention. The smoking cessation programmes focused on information, motivation, strategy, and maintenance.

SMOKING CESSATION OUTCOMES

The study demonstrated 8% and 16% 7 day point prevalence quit rates in the smoking cessation programme group at week 4 and week 8. Insufficient details were given regarding the quit rates of the control group.

George 2000 (quasi-RCT, USA, +) A quasi-RCT was conducted to assess the effectiveness of a specialised schizophrenia group therapy programme as compared to a standard therapy programme in 45 participants with schizophrenia or schizoaffective disorders who were motivated to quit smoking. All participants were given nicotine replacement therapy patches (21mg/24hr) for 6 weeks starting on the target quit date (week 3), decreasing to 14mg weeks 7-10, and 7mg weeks 11 and 12. The intervention group received weekly group therapy for 10 weeks, which was based on 3 weeks of motivational enhancement therapy, followed by 7 weeks of psycho-education, social skills training, and relapse prevention strategies. The control group received 7 weeks of manualised behaviour group therapy and supportive group counselling during the 3 remaining weekly group sessions, with each session lasting 60 minutes.

SMOKING CESSATION OUTCOMES

A borderline significant difference was detected for continuous abstinence (weeks 8-12, with expired CO bio-verification) in favour of the specialised schizophrenia group therapy (32.1% versus 23.5%; p=0.06). However, at 6 months follow-up a significantly greater proportion of participants in the standard therapy program were likely to be abstinent (point prevalence) than compared to the

specialised therapy group (17.6% versus 10.7%; p<0.03). Analysis of weekly expired CO levels demonstrated similar findings.

Williams 2010 (RCT, USA, +) A RCT was conducted to assess the effectiveness of a high intensity behavioural counselling programme in 100 outpatients diagnosed with schizophrenia or schizoaffective disorders, who were motivated to quit smoking. Participants were randomised to one of two high intensity programmes, the study labeled these as 'high intensity' and 'medium intensity'; however, both can be regarded as high intensity as defined by this review in the methods section. For ease, we have elected to use the labels as reported in the paper. The high intensity programme consisted of 24 sessions (45 minute duration each), whereas the medium intensity programme consisted of nine sessions (20 minute duration each); both were given over 26 weeks. The high intensity treatment comprised of a blended approach of motivational interviewing skills and CBT relating to social skills training and relapse prevention, and education relating to NRT. The medium intensity programme focused on smoking cessation, compliance with medication and education relating to NRT, monitoring psychiatric symptoms and education relating to interactions between psychiatric medications and tobacco. Target quit date was during week 5, from which all participants received NRT patches (21mg for 12 weeks, reducing to 14mg for 4 weeks) for 16 weeks.

SMOKING CESSATION OUTCOMES

The study demonstrated no significant difference in continuous abstinence (bio-verified by CO) at 12 weeks after target quit date between the high intensity and medium intensity programmes (15.6% versus 26.2%; p=0.22). Similar non-significant findings were seen at 26 weeks post target quit date (p=0.67) and at one year (p=0.78). No significant differences were seen from baseline to week 12 post target quit date between the high and medium intensity programmes for CO reduction (p=0.76) or the number of cigarettes smoked per day (p=0.35). A survival analysis assessing the time to first cigarette lapse was not significantly difference between the high and medium intensity programmes in a subset of 69 participants (mean 5.1 versus 6.3 days; p=0.32).

Wojtyna 2009 (NRCT, Poland, -)A non randomised pilot trial was conducted to assess the effectiveness of CBT in 44 heavy smoking in-patients who had a diagnosis of schizophrenia or depression. Participants received CBT or educational training for 12 weeks. The CBT group received 2 hour weekly therapeutic sessions which focused on enhancing self-esteem and weekly sessions on educational training. The study was reported in abstract format, with little details given about the interventions.

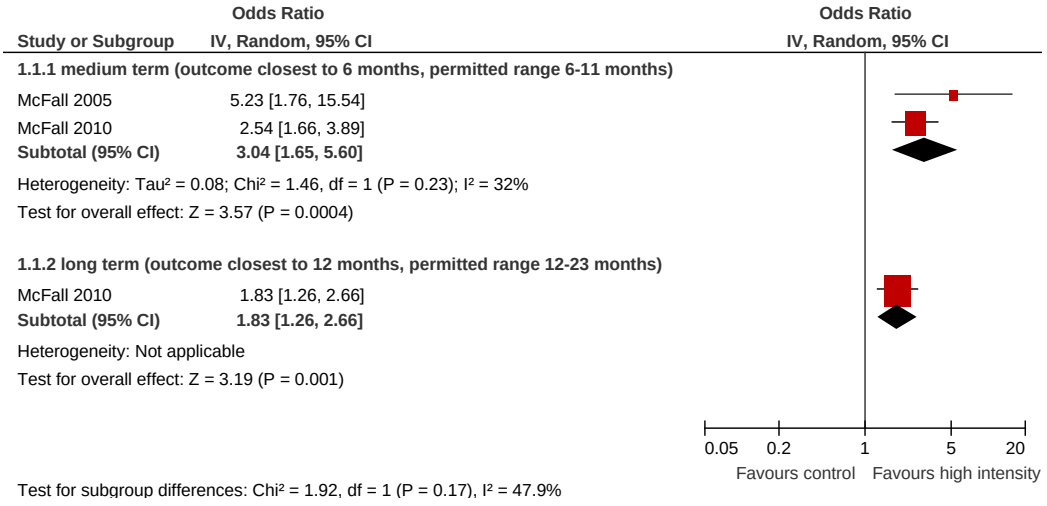
SMOKING CESSATION OUTCOMES

The study demonstrated participants in the CBT group were significantly more likely to report stopping smoking compared to the education training only group (OR 3.64, 95% CI 1.04-12.80; p=0.04). After treatment was completed, the study reported the CBT group smoked less than the education training only group.

META- ANALYSES OF HIGH INTENSITY BEHAVIOURAL THERAPY INTERVENTIONS

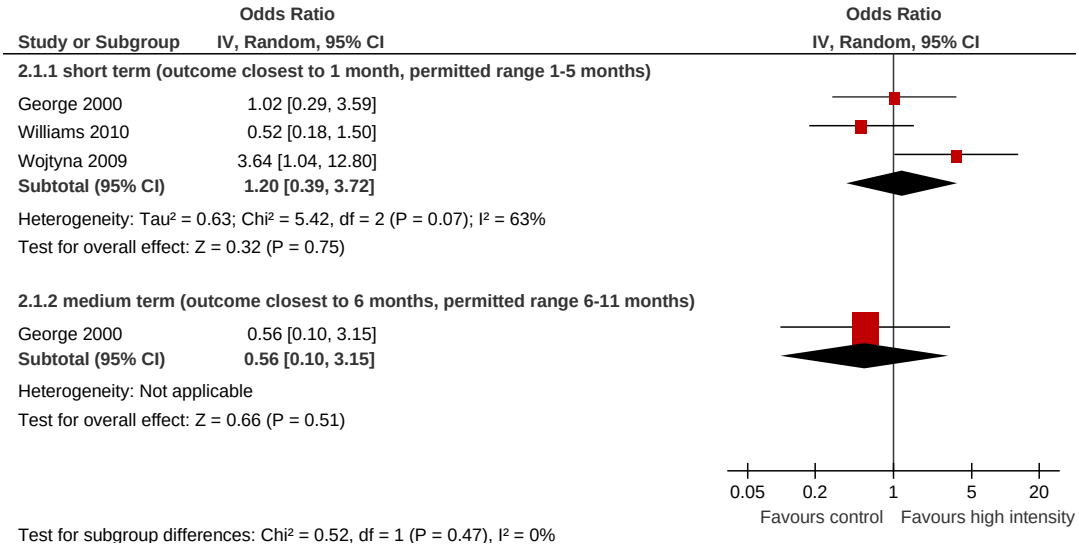
A random effects meta-analysis was conducted to assess the effect of high intensity behavioural therapy compared to control on point prevalence smoking cessation in PTSD. In a pooled analysis of two comparable studies in terms of package and delivery (**McFall 2005 [RCT, USA, +]; McFall 2010 [RCT, USA, ++]**), high intensity behavioural therapy significantly was effective for smoking cessation in the medium term (pooled OR 3.04, 95% CI 1.65-5.60, I^2=32%; Figure 2), and long term (OR 1.83, 95% CI 1.26-2.66; Figure 2) in PTSD. A similar significant effect was seen for continuous abstinence at long term follow-up (OR 2.26, 95% CI 1.30-3.91; **McFall 2010 [RCT, USA, ++]**).

Figure 2 **Meta-analysis of high intensity behavioural therapy for smoking cessation in PTSD**



A random effects meta-analysis was conducted to assess the effect of high intensity behavioural therapy compared to control on smoking cessation in schizophrenia. In a pooled analysis of three studies (**George 2000 [quasi-RCT, USA, +]; Wojtyna 2009 [NRCT, Poland -]; Williams 2010 [RCT, USA, +]**), high intensity behavioural therapy was no more effective for smoking cessation in the short term (pooled OR 1.20, 95% CI 0.39-3.72, I^2=63%; Figure 3), or in the medium term (OR 0.56, 95% CI 0.10-3.15; **George 2000 [quasi-RCT, USA, +]**; Figure 3) than control in schizophrenia. Please note for the **Williams 2010 (RCT, USA, +)** trial we have compared the effectiveness of high intensity versus medium intensity as defined empirically by the trial.

Figure 3 **Meta-analysis of high intensity behavioral therapy for smoking cessation in schizophrenia**



EVIDENCE STATEMENTS

ES1.1 There is moderate evidence from two trials (**McFall 2005 [RCT, USA, +]; McFall 2010 [RCT, USA, +]**) to suggest integrated tailored behavioural therapy was more effective for increasing smoking cessation in outpatients for PTSD in the short (pooled OR 3.04, 95% CI 1.65-5.60) and long (OR 1.83, 95% CI 1.26-2.66) term than usual standard of care (referral to a specialised smoking cessation clinic).

ES1.2 There is mixed weak evidence from four studies regarding the effectiveness of high intensity behavioural therapy in people with psychiatric disorders. One study (**Currie 2008 [Quasi-RCT, Canada, +]**) suggested high intensity behavioural therapy given for 8 weeks was marginally more effective than given for 4 weeks in outpatients; however no formal comparisons could be made to assess statistical significance. Evidence was mixed from two further studies where one study demonstrated no significant difference in abstinence between motivational interviewing or brief advice in 191 in-patients **(Brown 2003 [RCT, USA, +]**; long term outcome, OR 1.16, 95% CI 0.59-2.31), whereas the other demonstrated significantly fewer people smoked at short term follow-up in the high intensity behavioural therapy group compared to no intervention in 38 outpatients (**Kisely 2003 [NRCT, Australia, -])**. However, there was evidence from one study of 123 outpatients (**Morris 2011 [RCT, USA, +]**) which suggested high intensity behavioural therapy in addition to a quit-line service was more effective than quit-line service alone for reducing cigarette consumption (OR 3.16, 95% CI 1.04-9.65).

ES1.3 There is moderate evidence from three studies (**George 2000 [quasi-RCT, USA, +]; Wojtyna 2009 [NRCT, Poland, -]; Williams 2010 [RCT, USA, +]**) to suggest high intensity behavioural therapy is no more effective than lower intensity behavioural therapy for smoking cessation in the short (Pooled OR 1.20, 95% CI 0.39-3.72) or medium (OR 0.56, 95% CI 0.10-3.15) term in in-patients and outpatients with schizophrenia. Please note that two of these studies (**George 2000 [quasi-RCT, USA, +]; Williams 2010 [RCT, USA, +])** gave all participants NRT in addition to their behavioural therapy, and the intensity of the behavioural therapy in the control group of the **Williams 2010 [RCT, USA, +]** was relatively high.

The majority of evidence on high intensity behavioural therapy is directly applicable to the UK setting, as there is no reason to assume that the interventions could not be implemented in UK outpatient and in-patient settings. Six of the studies were conducted in the USA, with individual studies being conducted in Australia, Canada, China, and Poland.

Table 1 Summary evidence table for high intensity behavioural therapy

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Brown 2003 RCT, n=191	**Location:** USA **Setting:** In-patient	13-17 year olds, reporting smoking at least one cigarette per week for 4 weeks before hospitalisation, access to phone, DSM-IV criteria for anxiety disorder, disruptive and behavioural disorder, substance related disorder **Motivation:** Not reported	**Intervention:** Motivational interviewing, two 45 minute individual sessions while hospitalised. Following discharge received 2 NRT patch in those desired to quit, medically eligible, and smoked 10+ cigarettes per day. **Control:** Brief advice, 5-10 minutes of advice to quit smoking by study therapist. A copy of "I Quit!" self help pamphlet given too. NRT patch regimen allowed once after discharge **Outcome:** Point prevalence abstinence (7 day bio-verified by CO<10ppm and saliva cotinine <15ng/ml), number of cigarettes smoked per day, self-efficacy	+ **Limitations:** High participation refusal rate, caution needed to how generalisable the results are to general population of adolescent smokers, level of contact different between groups so difference may be due to this rather than content of treatment, specific to in-patients
Chen 2002 ITS, n=65	**Location:** China **Setting:** Outpatient	DSM – IV criteria for schizophrenia or schizoaffective disorder, 20+ cigarettes per day, participants who could stay for at least 60 minutes to participate in study, literate, willing to complete questionnaire **Motivation:** Not reported	**Intervention:** Smoking cessation programme – closed and time limited format. 8 sessions twice per week of 1 hour duration per session **Control:** No intervention **Outcome:** Point prevalence smoking abstinence (7 day)	- **Limitations: :** One psychiatric hospital, methods very unclear, no bio-verified smoking abstinence, control group had no intervention, short outcome
Currie 2008 Quasi-RCT, n=85	**Location:** Canada **Setting:** Outpatient	Severe and persistent mental illness (schizophrenia, mood disorders, other conditions), on one or more psychotic medications including antipsychotics, mood stabilizers, anxiolytics, antidepressants **Motivation:** Interest in quitting smoking	**Intervention:** 8 session version of smoking cessation program. NRT patches and gum encouraged **Control:** 4 session version of smoking cessation program. NRT patches and gum encouraged **Outcome:** Point prevalence abstinence (7 days, bio-verified with expired CO<10ppm), number of cigarettes per day in non-quitters	+ **Limitations:** Non-random assignment, different program lengths, low quit rate, lack of continuous abstinence

George 2000 Quasi-RCT, n=45	**Location:** USA **Setting:** Unclear	DSM-IV criteria for schizophrenia or schizoaffective disorder, and nicotine dependence, FTND≥5 **Motivation:** Motivated to quit smoking	**Intervention:** Specialised schizophrenia group therapy treatment, weekly group therapy for 10 weeks, comprising of 3 weeks of motivational enhancement therapy, and 7 weeks of psychoeducation, social skills training, relapse prevention strategies + NRT (21mg/day) **Control:** American Lung Association Programme, 7 weeks motivated behaviour group therapy programme and supportive group counselling during the remaining 3 weekly group sessions. Each session 60 minutes duration + NRT (21mg/day) **Outcome:** Point prevalence abstinence, continuous abstinence (weeks 8 to 12), expired CO levels	+ **Limitations:** Small sample size, not truly randomised with significant baseline differences, post-hoc analyses for atypical versus typical comparisons, setting unclear, no psychological outcomes assessed
Kisely 2003 UBA, n=38	**Location:** Australia **Setting:** Outpatient	10+ cigarettes smoked per day, 18-65 years of age, clinically stable, psychiatric diagnosis **Motivation:** Not reported	**Intervention:** 8 weekly 1.5 hour sessions behavioural therapy **Control:** No intervention **Outcome:** Retrieved case notes to assess the number of times tobacco use was recorded in the notes, FTND scores, urinary cotinine	- **Limitations:** High attrition rate, non-blinded assessment of outcome, no blinding of treatments, no control, short term follow-up, non-randomised design
Morris 2011 RCT, n=123	**Location:** USA **Setting:** Outpatient	Psychiatric diagnoses and continued to receive treatment as usual during the course of the study, at least 5 cigarettes per day, 18+ years of age, informed consent and participation in groups, English speaking **Motivation:** Interested in quitting regardless of motivational readiness to quit	**Intervention:** Quitline service and community tobacco cessation group, up to 10 sessions based on "Smoking Cessation for Persons with Schizophrenia" **Control:** Quitline service only, through fax referral **Outcome: :** Point prevalence abstinence (7 day, bio-verified by CO<6ppm), 50% reduction in self reported number of cigarettes smoked from baseline	+ **Limitations:** Small sample size, drop-out related to psychiatric diagnosis (highest in those with depression), training may have been insufficient for mental health illness population, no results reported for cessation for each treatment group, difference intensity of treatment for behavioural support which may be related to differences in outcome, rather than the content of the sessions

McFall 2005 RCT, n=66	**Location:** USA **Setting:** Outpatient	DSM-IV criteria for PTSD, 10+ cigarettes smoked per day **Motivation:** Willing to receive smoking cessation treatment	**Intervention:** Integrated care – 5 individual behaviour counselling cessations, once a week and one follow-up contact, duration about 20 minutes each **Control:** Usual standard of care – referred to Veterans Affairs Puget Sound Health Care Systems Smoking cessation clinic, one group orientation class, individual session in which receive treatment and behavioural counselling, received no tobacco-cessation interventions from PTSD clinic provider **Outcome:** Point prevalence abstinence (7 day, expired CO≤10ppm)	+ **Limitations:** No clearly demarcated quit date or end of intervention period, no biomarkers on long term smoking cessation, small sample size, different number of sessions between intervention and control, therefore differences may be due to number of contacts rather than content
McFall 2010 RCT, n=943	**Location:** USA **Setting:** Outpatient	DSM-IV diagnosis for PTSD, engaged in outpatient PTSD care, PTSD related to military service, 10+ cigarettes smoked per day on at least 15 out of 30 days before screening **Motivation:** Consented to receive cessation interventions	**Intervention:** Integrated care – PTSD clinicians delivered individual sessions based on 5 weekly core tobacco cessation sessions focusing on tobacco use education, behavioural skills for quitting smoking, setting a quit date and relapse prevention. Cessation medications allowed. Three follow-up monthly booster visits re-applied smoking cessation treatment to continued smokers **Control:** Usual standard of care - referral to specialised cessation clinics at each site, treatment within 6 weeks of referral, prescribed medications directly or through general practitioners **Outcome:** Prolonged abstinence (self-report and bio-verified by CO≤8ppm and urine cotinine<100ng/ml), point prevalence abstinence (7 day and 30 day)	++ **Limitations:** Selected sample of predominately older male Vietnam-era veterans with chronic PTSD and co-occurring depression, lack of blinding for outcome assessor, number of session differed between the groups, therefore difference could be related to higher contact rather than content of sessions
Williams 2010 RCT, n=100	**Location:** USA **Setting:** Outpatient	DSM-IV criteria for schizophrenia or schizoaffective disorder, more than 10 cigarettes smoked per day, atypical antipsychotic medication **Motivation:** Motivated to quit smoking	**Intervention:** Behavioural counselling – Treatment of Addiction to Nicotine in Schizophrenia (TANS) – high intensity treatment of 24 sessions (45 minutes duration each) + NRT patches (21mg/day) **Control:** Medication management (MM) – moderate intensity treatment of 9 sessions (20 minutes duration each) + NRT patches (21mg/day) **Outcome:** Continuous abstinence (bio-verified by	+ **Limitations:** Clinicians in trial were trained and delivered both TANS and MM treatments which could have blurred the distinction between the two treatments, NRT medication may have minimized the

			CO<10ppm), point prevalence abstinence (7 day), time to first lapse to smoking	behavioural therapy differences, different number of sessions, so difference may be due to number of contacts rather than content of sessions
Wojtna 2009 NRCT, n=44	**Location:** Poland **Setting:** In-patient	Mentally ill heavy smokers (diagnoses included schizophrenia and depression) **Motivation:** Not reported	**Intervention:** CBT, 12 weekly 2 hour therapeutic sessions concentrating on enhancing self-esteem, and 12 weekly educational sessions **Control:** Education training sessions only **Outcome:** Smoking abstinence, self-reported number of cigarettes smoked per day	- **Limitations: :** Lack of randomisation, lack of blinding, no intention to treat analysis, lack of information about population and methods

LOW INTENSITY BEHAVIOURAL THERAPY INTERVENTIONS

Axtmayer 2011 (RCT, USA, -) A randomised controlled pilot trial was conducted to assess the effectiveness of a telephone care coordination programme in 128 outpatients who were referred by their mental health providers. Participants were randomised to receive telephone counselling from a State Quitline, or face-to-face counselling from a specialist stop smoking advisor.

SMOKING CESSATION OUTCOMES

The study reported a significant reduction in the number of cigarettes smoked from baseline to follow-up at 2 months for participants who received at least one counselling session in both the State Quitline (mean 16.1 versus 9.3 cigarettes/day; p<0.0009) and Veteran Affairs counsellor (mean 17.9 versus 11.1 cigarettes/day; p=0.001) groups. No comparisons were made between treatment groups.

Dixon 2009 (cluster RCT, USA, ++) A cluster RCT was conducted to assess the effectiveness of a low intensity behavioural intervention in 304 outpatients with schizophrenia or schizoaffective disorders from mental health clinics. The low intensity behavioural intervention was implemented either immediately in 3 mental health clinics, or delayed for 6 months in 3 other mental health clinics. The intervention consisted of the '5 A's', based on i) assessing whether the participant smoked, ii) advising identified smokers to quit immediately, iii) assess the willingness of the participant to make a quit attempt within the next 30 days, iv) assist those identified as willing to make optimal quitting plans, which included provision of education handouts, v) arrange for next visit, which was likely to include group behavioural therapy.

SMOKING CESSATION OUTCOMES

The study demonstrated no significant difference from baseline to 6 months follow-up for whether the participant had smoked in the last 7 days between the immediate and delayed implementation groups (self-report smoking status, p=0.73; expired CO<10ppm, p=0.14). Additionally, no significant difference was seen from baseline to 6 months follow-up for in the number of cigarettes smoked in the last 7 days between the immediate and delayed implementation groups (p=0.36).

EVIDENCE STATEMENTS

ES2.1 There is very weak evidence from one RCT in 128 mental health outpatients (**Axtmayer 2011 [RCT, USA, -]**) to suggest brief intervention either from using a Quitline or a face-to-face counsellor resulted in a significant reduction in the number of cigarettes smoked per day from baseline (Mean reductions from 16.1 to 9.3 cigarettes/day, 17.9 to 11.1 cigarettes/day, respectively).

ES2.2 There is moderate evidence from one cluster RCT in 304 outpatients with schizophrenia or schizoaffective disorders (**Dixon 2009 [cluster RCT, USA, ++]**) to suggest low intensity behavioural support resulted in no significant difference in abstinence or smoking consumption.

The evidence from the two studies based on low intensity behavioural therapy is directly applicable to the UK setting as there is no reason to assume the interventions could not be implemented in UK outpatient and in-patient settings. Both studies were conducted in the USA.

Table 2 Summary evidence table for low intensity behavioural therapy

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Axtmayer 2011 RCT, n=128	**Location:** USA **Setting:** Outpatient	Smokers with mental illness **Motivation:** not reported	**Intervention:** Telephone care coordination programme with counselling from a State Quitline **Control:** Face-to-face counselling from a Veterans Affairs counsellor Outcome: Number of cigarettes smoked per day	- **Reasons:** Insufficient details given in abstract, small sample size, criteria for mental health disorder not provided, only performed within group comparisons, no bio-verification of smoking status
Dixon 2009 Cluster RCT, n=304	**Location:** USA **Setting:** Outpatient	DSM-IV criteria for schizophrenia spectrum disorder or affective psychoses or other psychoses, 18-64 years, at least 1 cigarette per month, English speaking, at least 2 appointments with psychiatrist in past 6 months, informed consent **Motivation:** Not reported	**Intervention:** Clinics wide immediate implementation of the 5 A's (i. assessing whether the participant smoked, ii. advising identified smokers to quit immediately, iii. assess the willingness of the participant to make a quit attempt within the next 30 days, iv. assist those identified as willing to make optimal quitting plans, which included provision of education handouts, v. arrange for next visit, which was likely to include group behavioural therapy) **Control:** Delayed implementation of 5 A's for 6 months, then implemented after delay **Outcome:** Point prevalence (7 day, bio-verified by expired CO<10ppm), self-report number of cigarettes smoked per week	++ **Limitations:** Relatively short term follow-up, participants not selected based on motivation, sites may have varied

CONTINGENCY PAYMENTS

CONTINGENCY PAYMENTS

Roll 1998 (USA, -) A non-randomised within-subject reversal design (Active →Control→Active) was conducted to assess the effectiveness of contingency payments in 11 outpatients undergoing treatment for schizophrenia or schizoaffective disorders, of which none considered ceasing their smoking upon entering the trial. During the baseline phases at weeks 1 and 3, participants were visited once per day in the afternoon and given $5 US for their participation. During the treatment phase in week 2, participants were visited three times per day and received cash payments if they were deemed abstinent as assessed by expired CO levels≤11ppm. $3 US was given for the first reading below the cut-off, and $0.50 for each subsequent reading throughout the week. Participants also received $10 US bonuses whenever three consecutive reading were below the cut-off in addition to their scheduled payments. Thus the total amount that could be received across all three conditions was $147 US.

SMOKING CESSATION OUTCOMES

There was a significant difference in the mean expired CO levels across the three conditions (mean 35.9 versus 15.9 versus 25.9ppm; $p<0.05$). Additionally, the total numbers of expired CO levels≤11pppm between the baseline phases and the active phase were significantly different (baseline 1 versus active, p=<0.05; baseline 2 versus active, $p<0.05$); however, no significant difference was seen between the baseline phases ($p>0.05$).

EVIDENCE STATEMENT

ES3.1 Weak evidence from one non-randomised within-subject reversal design trial (**Roll 1998 [NRCT, USA, -]**) suggested contingency payments rewards significantly reduced expired CO levels in 11 outpatients undergoing treatment for schizophrenia or schizoaffective disorders.

The evidence for contingency payments as an intervention for smoking cessation is potentially applicable to the UK as intervention may be feasible to the UK setting; however, this does not reflect current clinical practice in the UK. The study was conducted in the USA.

Table 3 Summary evidence table for contingency payments

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Roll 1998 Within participant reversal design, n=11	**Location:** USA **Setting:** Outpatient	DSM –IV schizophrenia or schizoaffective disorder, undergoing treatment for schizophrenia, current cigarette smokers, 18+ years of age, expired CO≥18ppm **Motivation:** None considering quitting cigarette smoking up on entering the study	**Intervention:** Contingency payment, week 2 of trial, visited three times per day, if expired CO was ≤11pm, they received payment. Total amount if abstinent on all 15 reading for the week was $147 US **Control:** Week 1 and 3, visited once per day, received $5 US for each day irrespective of CO reading **Outcome:** Number of expired CO readings≤11ppm, mean expired CO levels	- **Limitations:** More visits in the intervention phase than control phase, small sample size, abstinence not assessed, short follow-up

PHARMACOTHERAPIES

BUPROPION

Hertzberg 2001 (RCT, USA, +) A RCT was conducted to assess the effectiveness of bupropion in 15 male combat veterans outpatients who had a primary diagnosis of PTSD. Participants were randomised to bupropion SR (initial dose 150mg every morning for 3-4 days, increasing to 150mg given twice daily) or a matching placebo, for 12 weeks. The target quit date was set for at least one week post commencement of treatment. The study assessed outcomes at week 2, week 8, week 12 and 6 months. Sustained abstinence bio-verified by expired CO was measured, however no formal analyses were conducted due to 80% (4 out of 5 participants) of the placebo group failing to stop smoking or sustain their cessation and through not completing the 12 week trial.

SMOKING CESSATION OUTCOMES

At 12 weeks follow-up, no significant difference in sustained abstinence was seen between the groups (6/10 versus 1/5; p=0.282).

Weinberger 2008 (RCT, USA, -) A randomised controlled pilot trial was conducted to assess the effectiveness of bupropion for smoking cessation in 5 outpatients with a diagnosis of bipolar. Participants were randomised to receive bupropion intermediate release formulation (75mg once/day for 3 days increasing to 150mg [SR formulation] orally once/day for 4 days, increasing to 150mg orally twice/day by day 15), or a placebo, for a total of 10 weeks. All of the participants received weekly manualised behavioural group therapy session.

SMOKING CESSATION OUTCOMES

One out of the 2 patients randomised to bupropion achieved self-reported smoking abstinence with bio-verification using expired CO compared to none of the 3 participants in the placebo group.

Akbarpour 2010 (RCT, Iran, +) A RCT was conducted to assess the effectiveness of bupropion in 32 male in-patients diagnosed with schizophrenia. Participants were randomised to bupropion SR (150mg/day orally for 3 days, increasing to 300mg/day orally), or placebo, for 8 weeks.

SMOKING CESSATION OUTCOMES

The study demonstrated a significant reduction in the number of cigarettes smoked per day from baseline to week 8 in the bupropion group (mean 15.0 versus 11.1; p=0.008), but no significant reduction in the placebo group (mean 13.1 versus 13.4; p=0.72). A multivariable analysis demonstrated bupropion was significantly associated with increased likelihood of smoking abstinence at 12 weeks compared to placebo (p=0.03, data were not presented in a useable format for meta-analysis).

Bloch 2010 (RCT, Israel, -) A RCT was conducted to assess the effectiveness of bupropion in 61 outpatients with diagnoses of schizophrenia or schizoaffective disorders, who expressed a strong desire to quit or at least significantly reduce the number of cigarettes smoked. Participants received either bupropion at an initial dose of 150mg/day for 3 days increasing to 150mg twice per day, or placebo, for 14 weeks following a 2 week medication stabilisation period. All participants received 15 sessions of CBT over a 14 week period.

SMOKING CESSATION OUTCOMES

The study reported no significant treatment effect was seen for the self-reported number of cigarettes smoked per day between the bupropion and placebo groups at the end of 14 weeks ($p>0.1$); however, a significant reduction in the number of cigarettes smoked was seen when comparing baseline to week 14 ($p<0.001$).

Evins 2001 (RCT, USA, +) A RCT was conducted which assessed the effectiveness of bupropion in 18 outpatients diagnosed with schizophrenia, who had a desire to quit smoking. All participants received brief advice about smoking cessation, and were then randomised to bupropion SR (150mg/day), or placebo, for 12 weeks. Participants received CBT group therapy (9 weekly sessions, 1 hour duration each).

SMOKING CESSATION OUTCOMES

The study demonstrated no significant difference in abstinence from smoking (bio-verified by expired CO levels or serum cotinine) between the bupropion and placebo groups on the target quit date (3/9 versus 1/9; $p=0.58$), and at week 12 (sustained abstinence, 1/9 versus 0/9). However, at week 12, some evidence of a significant difference was seen between the treatment groups for those who achieved at least a 50% reduction in the number of self-reported cigarettes smoked per day (bio-verified with 30% reduction in expired CO levels) (6/9 versus 1/9; $p=0.05$); but no significant effect was seen between the treatment groups at the 6 month follow-up (3/9 versus 1/9). Levels of expired CO were significantly more reduced from baseline in the bupropion group as compared to placebo at week 12 (mean difference, 14.8ppm; $p<0.01$) and week 24 (mean difference, 14.3ppm; $p=0.03$). Additionally, the change in serum cotinine levels from baseline to week 12 were lower in the bupropion group compared to placebo (mean difference, 108ng/ml).

Evins 2005 (RCT, USA, ++) A RCT was conducted to assess the effectiveness of bupropion in 57 outpatients diagnosed with schizophrenia or schizoaffective disorders, who were willing to set a smoking quit date. Participants were randomised to bupropion (150mg/day for 7 days, if tolerated medication okay, then dose was increased to 150mg twice/day for 11 weeks), or placebo, for 12 weeks. All participants received 12 weekly sessions of CBT.

SMOKING CESSATION OUTCOMES

The study demonstrated those taking bupropion were significantly more likely to achieve continuous abstinence compared to placebo at 1 week immediately following target quit date, where 7 day point prevalence abstinence (bio-verified by CO<9ppm) was 36% versus 7%, respectively ($p=0.016$).

The significant difference in 7 day point prevalence abstinence was maintained to week 12 (16% versus 0%; p=0.043); however, no significant difference between the treatment groups was seen at week 14 (8% versus 3.6%) or at week 24 (4.0% versus 3.6%). From weeks 4-12, expired CO levels were significantly lower in the bupropion group compared to placebo (p=0.029), with mean reductions in expired CO levels significantly different from baseline to week 12 (mean reduction, 44% versus 20%), but not significant difference was seen in mean reductions of expired CO levels for weeks 14 to 24. Mean duration of abstinence was significantly longer in the bupropion group compared to placebo (mean, 2.0 versus 0.25 weeks; p=0.005). The change from baseline in the self-reported number of cigarettes smoked per day between the bupropion and placebo groups was significantly different at week 12 (mean reduction, 26.5 versus 10.2 cigarettes/day; p=0.002), and week 14 (p=0.018); but the difference was not statistically significant at week 18 or week 24.

Evins 2007 (RCT, USA, ++) A RCT was conducted which assessed the effectiveness of bupropion in 51 outpatients diagnosed with schizophrenia, who were willing to set a smoking quit date. Participants were randomised to receive bupropion (150mg per day for 7 days, increasing to twice daily for 11 weeks), or placebo (using the regimen as the active group), for 12 weeks. All participants additionally received 12 one hour weekly smoking cessation programme sessions. Following setting a target quit date; all participants received NRT patches (21mg/day for 4 weeks, decreasing to 14mg/day for 2 weeks, decreasing to 7mg/2 weeks). NRT gum (2mg) was used as needed up to a maximum dose of 18mg/day.

SMOKING CESSATION OUTCOMES

The study demonstrated 4 week abstinence (week 4-8) was significantly more likely in the bupropion group compared to the placebo group (52% versus 19%; OR 4.6, 95% CI 1.3-16; p=0.014); however, differences between the groups after week 8 became non-significant (week 12 [bio-verified by CO], OR 2.4, 95% CI 0.66-8.4; 3 months follow-up, OR 3.0, 95% CI 0.92-7; 12 month follow-up, OR 1.6, 95% CI 0.25-11). Significant differences were seen in the proportion of participants achieving at least a 50% reduction in smoking (week 12, 60% versus 31%, OR 3.4, 95% CI 1.1-10, p=0.036; week 24, 32% versus 7.7%, OR 5.7, 95% CI 1.1-30, p=0.039); however no significant difference was seen between the groups at short term follow-up (8 weeks, 60% versus 35%, OR 2.8, 95% CI 0.91-8.8). The study also reported differences in the number of cigarettes smoked per day between the bupropion and placebo groups at week 12 (mean difference, -21 versus -11 cigarettes/day) and at week 24 (mean difference, -9.5 versus -2.9 cigarettes/day); however no significance levels were reported. Expired CO levels were significantly lower in the bupropion group compared to placebo from weeks 4-24 (mean difference, -7.6ppm; p=0.006), and at each time point (p=0.002).

Fatemi 2005 (RCT, USA, -) A randomised controlled cross-over trial was conducted to assess the effectiveness of bupropion for smoking reduction in 10 outpatients with a diagnosis of schizophrenia or schizoaffective disorders, who were encouraged to reduce their smoking consumption rather than cease smoking entirely. Participants were randomised to bupropion (dose not stated), or placebo, in a cross-over design with a one week washout period between treatments.

The treatment phases were given for three weeks and outcome measures were taken at the end of the third week.

SMOKING CESSATION OUTCOMES

The study reported no difference in the self-reported number of cigarettes smoked per day between the bupropion and placebo groups; however, there appeared to be reductions from baseline to week 3 in expired CO levels, urine cotinine and metabolite levels during the bupropion phase, whereas these measures all increased during the placebo phase from baseline to week 3.

George 2002 (RCT, USA, ++) A RCT was conducted to assess the effectiveness of bupropion in 32 outpatients with schizophrenia or schizoaffective disorders who expressed a strong desire to quit smoking. Participants were randomised to bupropion SR (initial dose 150mg orally daily for 3 days increasing to 150mg orally twice per day), or matching placebo, for 10 weeks. All participants additionally received smoking cessation group therapy for 10 weeks on a weekly basis with each session lasting 60 minutes. The target quit date was during the 3rd group therapy session on week 3.

SMOKING CESSATION OUTCOMES

At 10 weeks follow-up, the study demonstrated bupropion was significantly more likely to result in continuous abstinence (week 7-10, bio-verified by CO<10ppm) compared to placebo (37.5% versus 6.3%; p<0.05). However at 6 month follow-up, no significant difference was seen in the 7 day point prevalence estimates between the bupropion and placebo groups (18.8% versus 6.3%; p=0.29). Bupropion significantly reduced CO levels compared with placebo (p<0.05), and a significant reduction in the self-reported number of cigarettes smoked per day in the bupropion groups as compared to placebo (p<0.05).

Li 2009 (RCT, China, -) A RCT was conducted to assess the effectiveness of bupropion in 69 male in-patients who were diagnosed with schizophrenia. Participants received bupropion (75mg twice/day for 1 week, increasing to 150mg twice/day for 3 weeks), or placebo, for 4 weeks.

SMOKING CESSATION OUTCOMES

The study reported a significant decrease in the number of cigarettes used per day between the bupropion and placebo groups at the end of the first week of treatment (p<0.01), at the end of week 4 (p<0.01), and at the end of the trial (week 8, p<0.01).

Weiner 2011b (RCT, USA, ++) A RCT was conducted to assess the effectiveness of bupropion in 46 outpatients diagnosed with schizophrenia or schizoaffective disorders, who were interested in quitting or cutting down their smoking. Participants were randomised to receive bupropion SR (150mg/day for 3 days, increasing to 150mg twice/day), or placebo, for 12 weeks. The randomised treatments started on week 2. Participants additionally received 9 week support group smoking programme, with NRT being offered to all, from baseline (week 0).

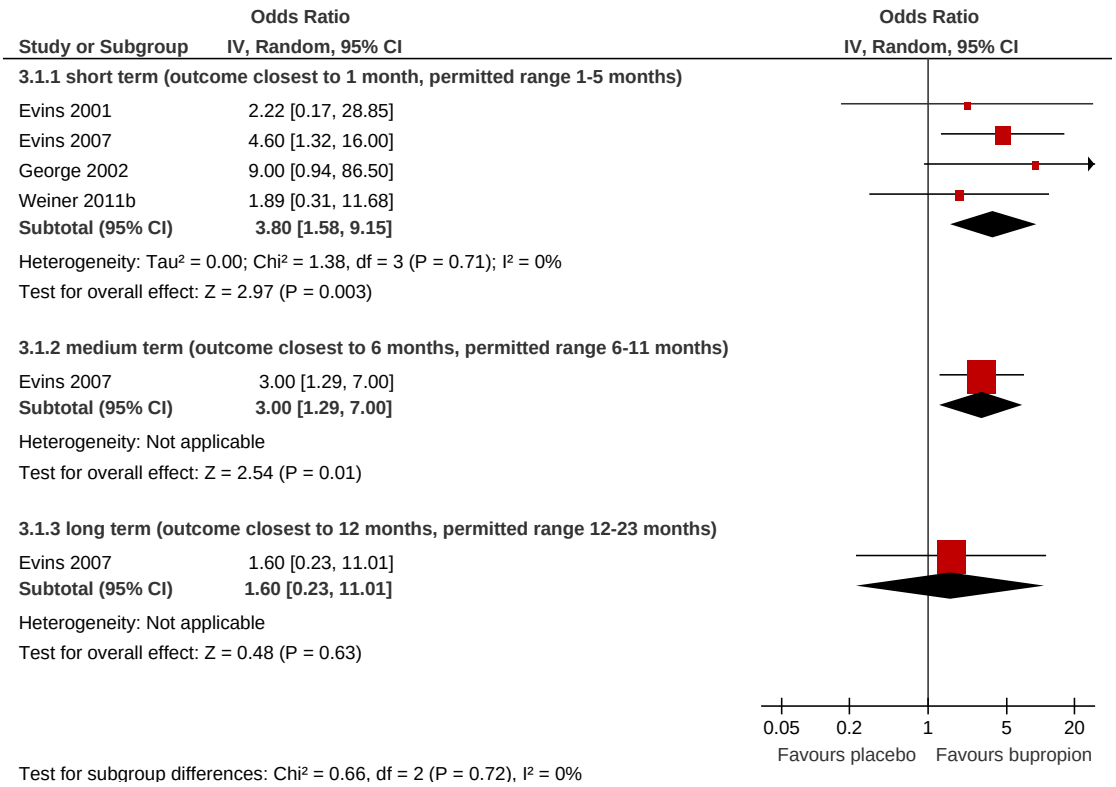
SMOKING CESSATION OUTCOMES

The study demonstrated no significant difference in sustained abstinence (week 10-14, bio-verified by CO<10ppm) between the bupropion and placebo groups (18% versus 11%; p=0.67). Weekly point prevalence abstinence numerically favoured the bupropion group over the course of the trial; however, no statistically significant difference was detected (p=0.29). Additionally, no significant differences were seen between the treatment groups over the course of the trial for expired CO levels (p=0.54), FTND scores (p=0.16), or urinary cotinine levels (p=0.13).

META-ANALYSIS FOR BUPROPION

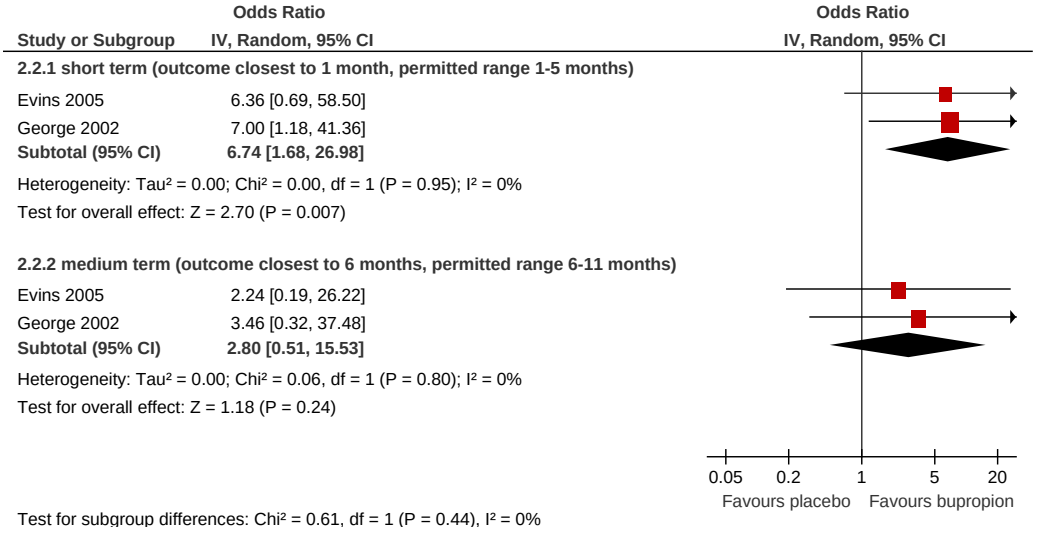
A random effects meta-analysis was conducted to assess the pooled effectiveness of bupropion as compared to placebo on **continuous abstinence** at short, medium and long term outcomes in schizophrenia or schizoaffective disorders. A pooled analysis of 4 studies demonstrated bupropion was effective for short term smoking cessation (OR 3.80, 95% CI 1.58-9.15, I^2=0%; Figure 4). Findings from one study suggested bupropion was effective at medium term (OR 3.00, 95% CI 1.29-7; Figure 4); however, there was no evidence that it was effective at long term (OR 1.60, 95% CI 0.23-11.01; Figure 4). Please note that all the participants in two of the trials in the meta-analysis received NRT (**Evins 2007 [RCT, USA, ++]; Weiner 2011b [RCT, USA, ++]**).

Figure 4 **Meta-analysis of bupropion for smoking cessation (continuous abstinence) in schizophrenia**



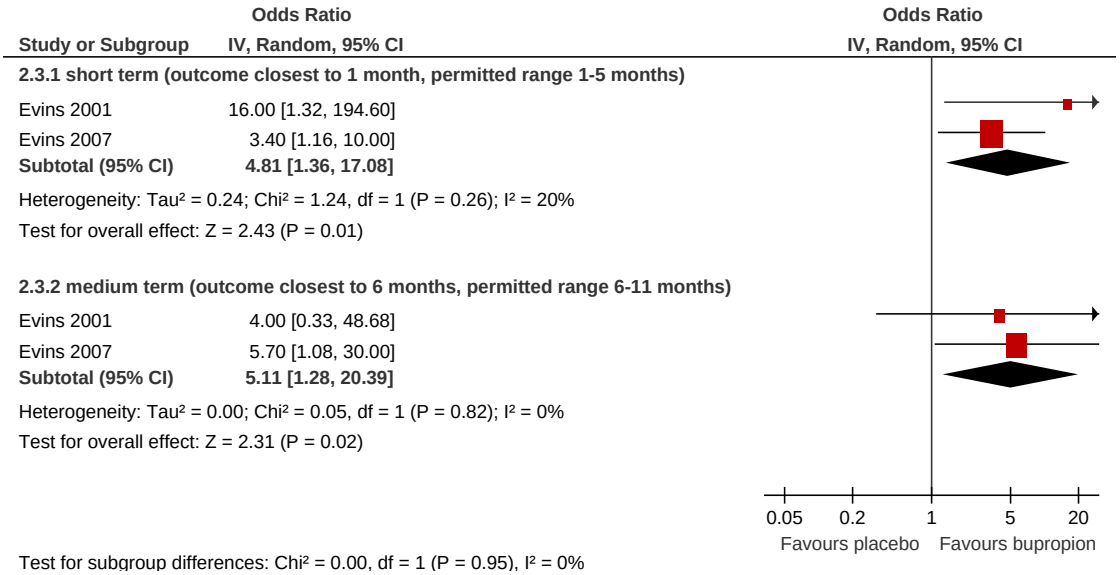
A random effects meta-analysis was conducted to assess the pooled effectiveness of bupropion as compared to placebo on **7 day point prevalence** abstinence at short and medium outcomes in schizophrenia or schizoaffective disorders. A pooled analysis of 2 studies demonstrated bupropion was effective for short term smoking cessation (OR 6.74, 95% CI 1.68-26.98, I^2=0%; Figure 5), but not at medium term outcome (OR 2.80, 95% CI 0.51-15.53, I^2=0%; Figure 5).

Figure 5 **Meta-analysis of bupropion for smoking cessation (point prevalence abstinence) in schizophrenia**



A random effects meta-analysis was conducted to assess the pooled effectiveness of bupropion as compared to placebo on **smoking reduction** of at least 50% in the number of cigarettes smoked per day (bio-verified by at least 30% or 40% reduction in expired CO levels) at short and medium outcomes in schizophrenia or schizoaffective disorders. A pooled analysis of 2 studies demonstrated bupropion was effective for short term smoking reduction (OR 4.81, 95% CI 1.36-17.08, I^2=20%; Figure 6) and at medium term (OR 5.11, 95% CI 1.28-20.39, I^2=0%; Figure 6). Please note that all of the participants received NRT in one of the trials included in the meta-analysis (**Evins 2007 [RCT, USA, ++]**).

Figure 6 **Meta-analysis of bupropion for 50% reduction in smoking in schizophrenia**



EVIDENCE STATEMENTS

ES4.1 There is weak evidence from one trial (**Hertzberg 2001 [RCT, USA, +]**) to suggest bupropion (300mg/day) is not effective for smoking cessation at short term follow-up in 15 male outpatients with PTSD.

ES4.2 There is very weak evidence from one trial (**Weinberger 2008 [RCT, USA, -]**) to suggest bupropion (300mg/day) is not effective for smoking cessation at short term follow-up in 5 outpatients with bipolar disorder.

ES4.3 There is strong evidence from pooled analyses comprising a total of five trials (**George 2002 [RCT, USA, ++]; Weiner 2011b [RCT, USA, ++]; Evins 2007 [RCT, USA, ++]; Evins 2001 [RCT, USA, +]; Evins 2005 [RCT, USA, ++]**) that bupropion (300mg/day) is effective for increasing smoking cessation in the short term in outpatients with schizophrenia (Pooled OR 3.80, 95% CI 1.58-9.15); but mixed strong evidence from pooled analyses comprising a total of three trials (**Evins 2007 [RCT, USA, ++]; George 2002 [RCT, USA, ++]; Evins 2005 [RCT, USA, ++]**) regarding the effectiveness of bupropion (300mg/day) for smoking cessation in the medium term in outpatients with schizophrenia (continuous abstinence, OR 3.00, 95% CI 1.29-7.00; point prevalence abstinence, pooled OR 2.80, 95% CI 0.51-15.53). Also, there is moderate evidence from one trial (**Evins 2007 [RCT, USA, ++]**) that bupropion is not effective for smoking cessation in the long term in outpatients with schizophrenia (OR 1.60, 95% CI 0.23-11.01).

ES4.4 There is moderate evidence from pooled analysis of two trials (**Evins 2007 [RCT, USA, ++]; Evins 2001 [RCT, USA, +]**) that bupropion (300mg/day) is effective for smoking reduction in the short term (Pooled OR 4.81, 95% CI 1.36-17.08) and medium (Pooled OR 5.11, 95% CI 1.28-20.39) term in outpatients with schizophrenia; however, there is very weak evidence from one trial (**Fatemi 2005 [RCT, USA, -]**) to suggest bupropion (dose not stated) had no significant effect on smoking reduction assessed as number of cigarettes per day smoked in outpatients with schizophrenia.

The evidence from the studies based on bupropion is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. The majority of studies were conducted in the USA, with individual studies being conducted in China, Iran, and Israel.

Table 4 Summary evidence table for bupropion

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Akbarpour, 2010 RCT, n=32	**Location:** Iran **Setting:** In-patients	Male smoking with schizophrenia (DSM-IV-TR) **Motivation:** not reported	**Intervention:** Bupropion SR (300mg/day) **Control:** Placebo **Outcome:** Self-reported smoking cessation	+ **Limitations:** Unclear methods used for randomization, unclear ITT analysis, small sample size, short follow-up, no bio-verification of abstinence
Bloch 2010 RCT, n=61	**Location:** Israel **Setting:** Outpatient	DSM-IV-TR criteria for schizophrenia or schizoaffective disorder, clinically stable, stable dose or anti-psychotic drug at least one month prior to start date, stable cigarette habits **Motivation:** Expressed strong desire to quit or at least significantly reduce the number of cigarettes smoked	**Intervention:** Following 2 week stabilisation period, Bupropion SR (300mg/day) and CBT **Control:** Placebo and CBT **Outcome:** Self-reported cigarette consumption	- **Limitations:** Small sample size, self-report outcome, completers analysis when high drop-out rate, short follow-up
Evins 2001 RCT, n=18	**Location:** USA **Setting:** Outpatient	DSM-IV diagnosis of schizophrenia, stable dose of antipsychotic medication for at least 4 weeks, reported cigarette use greater than half a packet per day **Motivation:** Desire to quit smoking	**Intervention:** Bupropion SR (150mg/day) + CBT **Control:** Placebo + CBT **Outcome:** Point prevalence abstinence (bio-verified by CO<9ppm or serum cotinine<14ng/ml), 50% reduction from baseline in self-reported cigarettes smoked per day (bio-verified by at least 30% reduction in expired CO), expired CO levels	+ **Limitations:** Small sample size, insufficient information regarding population
Evins 2005 RCT, n=57	**Location:** USA **Setting:** Outpatient	DSM-IV criteria for schizophrenia or schizoaffective disorder, depressed type, stable symptoms and a stable dose of	**Intervention:** Bupropion SR (300mg/day) + CBT **Control:** Placebo + CBT **Outcome:** Point prevalence and continuous abstinence from smoking in past 7 days (bio-verified by CO<9ppm), self-reported number of cigarettes smoked in past 7 days ,	++ **Limitations:** Intention to treat analysis not used

		antipsychotic medication for 30 days, baseline Hamilton Depression score<20, smoked 10+ cigarettes per day **Motivation:** Willing to set a quit date within 4 weeks of enrolment	expired CO levels, duration of abstinence	
Evins 2007 RCT, n=51	**Location:** USA **Setting:** Unclear	Adults with schizophrenia DSM-IV, capacity to consent, stable psychiatric symptoms and antipsychotic dose for 30 days or more, smoked 10+ cigarettes per day for past year **Motivation:** Willing to set a smoking quit date within 4 weeks of enrolment	**Intervention:** Bupropion SR (300mg/day) + behavioural support + NRT patches (21mg/day) + NRT gum (as needed) **Control:** Placebo + behavioural support + NRT patches (21mg/day) + NRT gum (as needed) **Outcome:** Smoking cessation at 3 months, continuous abstinence (bio-verified by CO, cut off not reported), 50% reduction in smoking compared to baseline by self-report (bio-verified by at least 40% reduction in expired CO levels), number of cigarettes smoked per day, expired CO levels	++ **Limitations:** Small sample size, insufficient information regarding source population and setting
Fatemi 2005 RCT, n=10	**Location:** USA **Setting:** Outpatient	DSM-IV criteria for schizophrenia or schizoaffective disorder and nicotine dependence. **Motivation:** Encouraged to reduce smoking rates rather than quit entirely	**Intervention:** Bupropion HCL (dose not stated) **Control:** Placebo **Outcome:** Self-reported number of cigarettes smoked per day, expired CO levels, urine cotinine levels	- **Limitations:** Small sample size, short intervals between outcome timings, outcomes measured at several time points, but only selected ones reported in paper, no statistical results presented, insufficient details regarding dose of treatment
George 2002 RCT, n=32	**Location:** USA **Setting:** Outpatient	DSM-IV criteria for schizophrenia or schizoaffective disorders with nicotine dependence, FTND≥5, CO≥10ppm, plasma cotinine≥150ng/ml, clinically stable on psychotic and affective symptomatology **Motivation:** Expressed a strong	**Intervention:** Bupropion (300mg/day) + smoking cessation group therapy **Control:** Placebo + smoking cessation group therapy **Outcome:** Point prevalence abstinence (7 day, bio-verified by CO<10ppm), continuous abstinence (weeks 7 to 10, bio-verified by CO<10ppm), CO levels, number of cigarettes smoked per day	++ **Limitations:** Small sample size, lack of objective assessment of compliance with study medications

		desire to quit smoking		
Hertzberg 2001 RCT, n=15	**Location:** USA **Setting:** Outpatient	DSM-IV for primary diagnosis of PTSD, no psychotropic medication or stable psychotic regimen, same dose and drug for 6 months **Motivation:** Not reported	**Intervention:** Bupropion (300mg/day) **Control:** Placebo **Outcome:** Sustained abstinence	+ **Limitations:** Small sample size, limited outcomes, funded by pharmaceutical company
Li 2009 RCT, n=69	**Location:** China **Setting:** In-patient	Male participants with schizophrenia, but criteria for diagnosis not reported **Motivation:** Not reported	**Intervention:** Bupropion (300mg/day) **Control:** Placebo **Outcome:** Self-reported number of cigarettes smoked per day	- **Limitations:** Short follow up, insufficient methodological details, lack of bio-verified smoking status
Weinberger 2008 RCT, n=5	**Location:** USA **Setting:** Outpatient	DSM-IV diagnosis of bipolar disorder and nicotine dependent cigarette smokers, 10+ cigarettes per day, expired CO>10ppm, clinically stable **Motivation:** Not reported	**Intervention:** Bupropion SR (300mg/day) **Control:** Placebo **Outcome:** Smoking abstinence (bio-verified with expired CO<10ppm)	- **Limitations:** Eligible subjects difficult to recruit, very small sample size, high drop-out rate
Weiner 2011b RCT, n=46	**Location:** USA **Setting:** Outpatient	DSM-IV diagnosis schizophrenia or schizoaffective disorder, clinically stable, ≥10 cigarettes per day **Motivation:** Interested in quitting or cutting down	**Intervention:** Bupropion (300mg/day) **Control:** Placebo **Outcome:** Sustained abstinence (weeks 10-14, bio-verified by CO<10ppm), point prevalence abstinence, expired CO levels, urine cotinine levels, FTND	++ **Limitations:** Small sample size, short follow-up

CLOZAPINE

Clozapine is an atypical antipsychotic medication. Switching from typical antipsychotic medications to atypical antipsychotic medications has been suggested to reduce smoking.

McEvoy 1995 (RCT, USA, -) A randomised controlled three-arm pilot trial was conducted to assess the effectiveness of the atypical antipsychotic clozapine for smoking cessation in 12 chronically hospitalised in-patients diagnosed with chronic schizophrenia. All participants initially received haloperidol (typical antipsychotic) (20mg/day) for 2 weeks; then participants were randomised to clozapine either at a low plasma level range (50-150ng/ml), medium plasma level range (200-300ng/ml), or high plasma level range (350-450ng/ml), for 12 weeks. Participants were normally only allowed to smoke one cigarette per hour on the wards of the hospital; however, during the trial they were allowed free access to cigarettes over a 120 minute period in the afternoon when outcome measures were collected.

SMOKING CESSATION OUTCOMES

The study demonstrated significant reductions in the change from baseline to week 12 in number of cigarettes smoked per 120 minute period (p=0.02), and significant reductions in the levels of expired CO at 12 weeks (p=0.04); however, only the medium range group was associated with a significantly greater decline in expired CO than compared to the low range group.

McEvoy 1999 (RCT, USA, +) A randomised controlled three-arm trial was conducted to assess the effectiveness of clozapine in 55 smoking and 15 non-smoking in-patients with schizophrenia who had previously failed to respond to adequate treatment regimens of at least two atypical antipsychotic medications. Participants were initially measured at baseline for 1-2 weeks whilst they received haloperidol or fluphenazine (typical antipsychotics, mean dose 21mg/day, range 5-60mg/day) and an anti-cholinergic, anti-Parkinson's disease drug. Following baseline measurements, participants were randomised to receive clozapine either at a low plasma level range (50-150ng/ml), medium plasma level range (200-300ng/ml), or high plasma level range (350-450ng/ml), for 12 weeks. Participants were normally only allowed to smoke one cigarette per hour on the wards of the hospital; however, during the trial they were allowed free access to cigarettes over a 120 minute period in the afternoon when outcome measures were collected.

SMOKING CESSATION OUTCOMES

In the 55 smokers, participants receiving higher plasma level doses (combination of medium and high plasma level groups) were significantly more likely to have a greater reduction in the number of cigarettes smoked during the 120 minutes between baseline and 12 weeks compared to the low plasma level group (p=0.005). However, no significant differences were seen between the higher plasma level groups compared to the low plasma level group in the change from baseline to week 12 for expired CO levels (p=0.24), plasma nicotine levels (p=0.57), or plasma cotinine levels (p=0.27).

De Leon 2005 (RCT, USA, +) A RCT was conducted to assess the effectiveness of clozapine in 50 smoking and non-smoking in-patients with moderate severity of schizophrenia or schizoaffective disorders, which had not shown a satisfactory clinical response to at least 3 neuroleptic drugs. Participants initially receive haloperidol (10mg/day) for 4 weeks; and then were randomised to receive clozapine either at 100mg/day, 300mg/day or 600mg/day doses, for 16 weeks. Participants who were non-responsive were included in a second and/or third 16 week double blind trial where they received the remaining doses. For the 38 current smokers, cigarettes were provided free of charge to the participants at standard smoking time in the unit.

SMOKING CESSATION OUTCOMES

The study demonstrated no significant changes in plasma nicotine from baseline to week 16 in the 100mg/day (p=0.7), 300mg/day (p=0.4), 600mg/day (p=0.6) treatment groups.

EVIDENCE STATEMENT

Clozapine is an atypical (new generation) antipsychotic medication. There is emerging evidence that switching from typical antipsychotic medications to atypical antipsychotic medications reduces smoking.

ES5.1 There is moderate evidence from three trials (**McEvoy 1995 [RCT, USA, -]; McEvoy 1999 [RCT, USA, +]; De Leon 2005 [RCT, USA, +]**) suggesting higher doses of clozapine (350-600mg/day) in in-patients with schizophrenia or schizoaffective disorders may reduce the self-reported number of cigarettes smoked per day; however, no effects were seen on objective markers of smoking consumption (expired CO or plasma nicotine levels).

The evidence from the three studies based on clozapine as a smoking cessation medication is potentially applicable to the UK setting as there is no reason to assume that the intervention would not have the same outcome in a UK setting. All three studies were conducted in the USA.

Table 5 Summary evidence table for clozapine

Study details	Location and setting	Description of population	Outline of study	Internal validity score
De Leon 2005 RCT, n=50	**Location:** USA **Setting:** In-patient	DSM-III-R schizophrenia or schizoaffective disorder, not shown satisfactory clinical response to treatment with at least three neuroleptic drugs, had Clinical Global Impression Scale of moderately ill, had Brief Psychiatric Rating Scale total of at least 45 **Motivation:** Not reported	**Intervention 1:** Clozapine (600mg/day) **Intervention 2:** Clozapine (300mg/day) **Control:** Clozapine (100mg/day) **Outcome:** Plasma cotinine levels (ng/ml)	+ **Limitations:** Type II error (lack of power), only within group tests performed
McEvoy 1995 RCT, n=12	**Location:** USA **Setting:** In-patient	DSM-III-R criteria for chronic schizophrenia, smoked cigarettes, clinically hospitalised for substantial persistent psychopathology **Motivation:** Not reported	**Intervention 1:** Clozapine (high plasma range, 350-450 ng/ml) **Intervention 2:** Clozapine (medium plasma range, 200-300ng/ml) **Control:** Clozapine (low plasma range, 50-150ng/ml) **Outcome:** Number of cigarettes smoked per day, expired CO levels	- **Limitations:** Very small sample size, baseline expired CO levels lower in low plasma group as compared to intervention groups, no measure of abstinence, short follow-u
McEvoy 1999 Randomised BA, n=55 smokers	**Location:** USA **Setting:** Unclear (seems like in-patient)	DSM-III-R criteria for schizophrenia, all previously failed to respond to adequate trials of at least 2 conventional antipsychotic medications **Motivation:** Not reported	**Intervention 1:** Clozapine (high plasma range, 350-450 ng/ml) **Intervention 2:** Clozapine (medium plasma range, 200-300ng/ml) **Control:** Clozapine (low plasma range, 50-150ng/ml) **Outcome:** Research staff counted number of cigarette butts smoked by participation during 120 minutes of free available cigarette smoking cessation, expired CO level, serum nicotine and cotinine levels at end of 120 minute session	+ **Limitations:** Small sample size in whom serum nicotine and cotinine were measured, no stratification by smoking status, short follow-up

FLUOXETINE

Fluoxetine is an antidepressant from the selective serotonin reuptake inhibitor (SSRI) class.

Cornelius 1997 (RCT, USA, +) A RCT was conducted to assess the effectiveness of fluoxetine in 25 in-patients of a psychiatric hospital diagnosed with co-morbid major depression (severe to very severe levels) and alcohol dependence. Participants were randomised to receive fluoxetine (20mg capsule, increasing to 2 capsules after 2 weeks if substantial residual depression symptoms persisted) or placebo, for 12 weeks. All participants received usual care as outpatients following discharge from the hospital, which comprised of weekly supportive psychotherapy sessions.

SMOKING CESSATION OUTCOMES

The study demonstrated self-reported number of cigarettes smoked per day was fewer in the fluoxetine group compared to placebo (mean 16.2 versus 22.3 cigarettes/day) across the 12 weeks; however, the difference when comparing the treatment groups was not statistically significant.

EVIDENCE STATEMENT

Fluoxetine is an antidepressant from the selective serotonin reuptake inhibitor (SSRI) class. It has been suggested that antidepressant, such as fluoxetine, may be effective for smoking cessation.

ES6.1 There is weak evidence from one trial (**Cornelius 1997 [RCT, USA, +]**) of 25 in-patients with major depression suggested fluoxetine (40mg/day) had no significant effect on the number of cigarettes smoked per day in the short term.

The evidence from the individual study on fluoxetine as a smoking cessation medication is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. The study was conducted in participants with co-morbid alcohol dependence in the USA.

Table 6 Summary evidence table for fluoxetine

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Cornelius 1997 RCT, n=25	**Location:** USA **Setting:** In-patient	Co-morbid depression and alcohol dependence, DSM-III-R, 10+ cigarettes per day **Motivation:** Not reported	**Intervention:** Fluoxetine, one capsule (20mg/day), could be increased to 2 capsules per day after 2 weeks if substantial residual depressive symptoms persisted (however, this was rare). **Control:** Placebo capsule **Outcome:** Self-reported number of cigarettes per day	+ **Limitations:** Modest sample size, lack of long term follow-up, self-reported outcome

GALANTAMINE

Galantamine is an alkaloid that is used for the treatment of mild to moderate Alzheimer's disease and other memory impairments.

Kelly 2008 (RCT, USA, -) A RCT was conducted to assess the effectiveness of galantamine in 86 smoking or non-smoking participants with schizophrenia or schizoaffective disorders who were being treated either as in-patients or outpatients. Participants were randomised to galantamine (initial dose of 8mg/day given twice daily with an increase of 8mg/day every 4 weeks to a maximum dose of 24mg/day) or a matching placebo, for 12 weeks.

SMOKING CESSATION OUTCOMES

The study demonstrated at the end of the 12 weeks that smokers who were randomised to galantamine (n=18) had non-significantly different expired CO levels to smokers randomised to placebo (n=24) (p=0.40). Additionally, no significant difference was seen in the number of cigarettes smoked at the end of the 12 weeks between the two treatment groups (p=0.11).

EVIDENCE STATEMENT

Galantamine is an alkaloid that is used for the treatment of mild to moderate Alzheimer's disease and other memory impairments. It has been suggested that galantamine may be useful for smoking cessation.

ES7.1 There is very weak evidence from one RCT of 42 inpatients and outpatients with schizophrenia (**Kelly 2008 [RCT, USA, -]**) of no effect of galantamine (maximum dose of 24mg/day) on self-reported and objective markers of cigarette use in the short term.

The evidence from the individual study on galantamine as a smoking cessation medication is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. The study was conducted in the USA.

Table 7 Summary evidence table for galantamine

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Kelly 2008 RCT, n=43 smokers	**Location:** USA **Setting:** In-patient and outpatient	Smokers, DSM-IV diagnosis for schizophrenia or schizoaffective disorder, 18-60 years of age, chronically stable, antipsychotic agent other than clozapine, Simpson-Angus Extrapyramidal symptoms score≤4 **Motivation:** Not reported	**Intervention:** Galantamine (max 24mg/day) **Control:** Placebo **Outcome:** Number of cigarettes smoked per day, expired CO levels	- **Limitations:** Lack of objective measure of abstinence, lack of bio-verified outcome, randomised smokers and non-smokers, small sample size, excluded participants from analysis that did not adhere to randomised medication

NALTREXONE

Naltrexone is an opioid receptor antagonist which is used in alcohol dependence and opioid dependence.

Szombathyne-Meszaros 2010 (RCT, USA, +) A RCT was conducted to assess the effectiveness of naltrexone in 79 outpatients diagnosed with schizophrenia or schizoaffective disorders with co-morbid alcohol dependence. Participants were randomised to receive oral naltrexone at an equivalent dose of 50mg/day (100mg on Monday's, 100mg on Wednesday's, and 150mg on Friday's), or placebo, for 12 weeks.

SMOKING CESSATION OUTCOMES

No significant difference was seen in the proportion of participant's achieving cessation at the end of 12 weeks between the naltrexone and placebo groups (2/41 versus 2/38). Additionally, no significant differences were seen in the number of cigarettes smoked per day from baseline to week 12 between the naltrexone and placebo groups; however, significantly lower numbers of cigarettes were smoked within each treatment group from baseline to week 12 (naltrexone, baseline: 126 versus end of trial: 101 cigarettes/day; placebo, baseline: 121 versus end of trial: 103 cigarettes/day).

EVIDENCE STATEMENT

Naltrexone is an opioid receptor antagonist which is used for the treatment of alcohol dependence and opioid dependence.

ES8.1 There is moderate evidence from one RCT in 79 outpatients diagnosed with schizophrenia or schizoaffective disorders with co-morbid alcohol dependence that naltrexone (50g/day) had no significant effect on abstinence or self-reported numbers of cigarettes smoked per day (**Szombathyne-Meszaros 2010 [RCT, USA, +]**).

The evidence from the individual study on naltrexone as a smoking cessation medication is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. The study was conducted in participants with co-morbid alcohol dependence in the USA.

Table 8 Summary evidence table for naltrexone

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Szombathyne-Meszaros 2010 RCT, n=79	**Location:** USA **Setting:** Outpatient	Schizophrenia or schizoaffective disorder with co-morbid alcohol and nicotine dependence **Motivation:** Not reported	**Intervention:** Naltrexone (50mg/day) **Control:** Placebo **Outcome:** Smoking cessation, number of cigarettes smoked adjusted for baseline	+ **Limitations:** Insufficient methodological details in abstract

NICOTINE REPLACEMENT THERAPY

Dalack 1999 (NRCT, USA, -) A non-randomised cross-over trial was conducted to assess the effectiveness of NRT in 10 in-patients of a general psychiatry unit who were diagnosed with schizophrenia or schizoaffective disorders. Participants received either a NRT patch (22mg/24hr) or a placebo patch on the morning of day 1, and were left to smoke as much as they preferred, with measurements being taken in the afternoon. On day 2, study personnel replaced the patch with the same treatment condition and the protocol followed that of day 1. After a five day wash-out period, participants received the other condition on days 8 and 9, following the same protocol as one day 1.

SMOKING CESSATION OUTCOMES

The study demonstrated that while the mean expired CO levels decreased by 15% during the active compared to the placebo patch condition, this was not statistically significant (p=0.14). Additionally, similar numbers of cigarettes were smoked per day on NRT compared to placebo (mean 25.3 versus 26.1 cigarettes per day).

Hartman 1991 (RCT, USA, ++) A randomised cross-over controlled trial was conducted to assess the effectiveness of NRT in 3 in-patients and 11 outpatients who were receiving psychiatric services. Participants were randomised to receive a 24μl solution containing either 30% nicotine base (8mg) or water (placebo). The solutions were applied in the morning and covered with a polyethylene wrap and secured with surgical tape. Participants were instructed to smoke as much of their preferred brand of cigarettes as they wanted for 7 hours, and the number of cigarettes smoked was observed and recorded by study personnel. One week later the participants received the other solution.

SMOKING CESSATION OUTCOMES

The study demonstrated participants smoked significantly less cigarettes during the 7 hour period when they were wearing the nicotine patch compared to placebo patch (mean 9.9 versus 11.8 cigarettes smoked, p<0.04).

Chou 2004 (RCT, China, -) A RCT was conducted to assess the effectiveness of NRT in 68 participants with schizophrenia attending a day care ward at a psychiatric hospital. Participants were randomised to receive NRT patch (14mg/day for weeks 1-6, decreasing to 7mg/day for weeks 7-8), or a control group, for 8 weeks.

SMOKING CESSATION OUTCOMES

The study demonstrated significantly greater reductions in the NRT patch group from the end of the first week of patch use for expired CO levels (p<0.0001) and self-reported number of cigarettes smoked per day (p<0.001), and continued being reduced through to 3 months follow-up (CO levels, p<0.0001; self-reported number of cigarettes smoked per day, p<0.0001) compared to placebo. Additionally, point prevalence abstinence (bio-verified by CO<10ppm) were higher in the NRT patch group (26.9%) as compared to placebo (0%) at 3 months follow-up.

Williams 2007 (RCT, USA, +) A RCT was conducted to assess the effectiveness of high dose NRT in 51 outpatients diagnosed with schizophrenia or schizoaffective disorders. Participants were randomised to high dose NRT (42mg patch), or standard dose (21mg patch), for 8 weeks.

SMOKING CESSATION OUTCOMES

The study reported no significant difference in 7 day point prevalence abstinence between the high dose and standard dose treatment groups at 8 weeks (8/25 versus 6/26; p=0.48). Additionally, time to first relapse back to smoking was reported to be not significantly different between the treatment groups.

Hill 2007 (NRCT, USA, -) A non-randomised pilot study was conducted to assess the effectiveness of adding nicotine replacement therapy to CBT in 9 participants with major depressive disorders who were interested in smoking cessation. CBT was given to both treatment groups and consisted of 8 weekly group sessions lead by the study physician. The group sessions last for 60 minutes each and were focused on monitoring of thoughts, daily activities, interpersonal contacts, and mood. The intervention group additionally received nicotine replacement therapy (14mg) patches daily for 8 weeks. The target quit date was set for 8 days post start of CBT, and follow-ups were monitored monthly.

SMOKING CESSATION OUTCOMES

The study demonstrated no significant difference between the treatment groups on the number of cigarettes smoked per day at 3 months follow-up.

Thorsteinsson 2001 (RCT, USA, +) A randomised mixed-design controlled trial was conducted which assessed the effectiveness of NRT patches in 38 outpatients with un-medicated major depression who were motivated to quit. The participants were randomised to NRT patches (21mg/24hr) for 2 weeks followed by placebo for one week, or placebo patches for 2 weeks followed by placebo for 1 week. The placebo patches contained 22mg of nicotine but has a barrier to prevent absorption. The participants were allowed to smoke for the first 8 days of the study at the end of which the target quit date was set, followed by 14 days of the assigned intervention, followed by 7 days of placebo, and 6 days of follow-up, thus the total length of the study was 29 days.

SMOKING CESSATION OUTCOMES

The study demonstrated self-reported abstinence was significantly more likely in the NRT group compared to the placebo group (78% versus 50%; one sided $p<0.05$) at day 29. No significant interaction was detected on the average total withdrawal ratings (assessed using the Nicotine symptoms Checklist and Hughes-Hatsukami Withdrawal Questionnaire).

EVIDENCE STATEMENTS

ES9.1 There is moderate evidence from one trial (**Hartman 1991 [RCT, USA, ++]**) to suggest NRT (8mg given once) is effective for smoking reduction in the very short term (7 hours follow-up) in 14 in-patients and outpatients with psychiatric disorders.

ES9.2 There is weak evidence from one trial (**Williams 2007 [RCT, USA, +]**) to suggest there is no significant benefit in smoking cessation from using high dose NRT (42mg patch) compared to standard dose NRT (21mg patch) in the short term in 51 outpatients with schizophrenia.

ES9.3 There is mixed very weak evidence from two trials (**Dalack 1999 [NRCT, USA, -]; Chou 2004 [RCT, China, -]**) regarding the effectiveness of standard dose NRT (22mg/24hr or 14mg/day) for smoking reduction or cessation in schizophrenia, where a significant decrease in mean expired CO levels was seen on the day following the patch application, but no reduction in the number of cigarettes smoked in one trial (**Dalack 1999 [NRCT, USA, -]**). In the other trial (**Chou 2004 [RCT, China, -]**), significant reductions in expired CO levels, self-reported number of cigarettes smoked per day and point prevalence abstinence (bio-verified by CO<10ppm) were seen in the NRT patch compared to placebo.

ES9.4 There is mixed weak evidence from two trials (**Thorsteinsson 2001 [RCT, USA, +]; Hill 2007 [NRCT, USA, -]**) regarding the effectiveness of standard dose NRT (21mg/24hr or 14mg/day) for smoking reduction or cessation in major depression, where smoking cessation was significantly more likely in the short term in one study (**Thorsteinsson 2001 [RCT, USA, +]**), but no significant difference was seen in the number of cigarettes smoked in the short term in the other study (**Hill 2007 [NRCT, USA, -]**).

The evidence from the studies on NRT is applicable to the UK setting as the study was predominately based on outpatient populations with mental health disorders, and the intervention reflects current clinical prescribing practice in the UK for smoking cessation, and could be feasible within populations with mental health disorders. The studies were conducted predominately in the USA, with a further study being conducted in China.

Table 9 Summary evidence table for NRT

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Chou 2004 RCT, n=68	**Location:** China **Setting:** Unclear	18+ years, 15+ cigarettes per day for at least one years, at least 45.4 kg weight **Motivation:** Not reported	**Intervention:** NRT patch (14 mg/day) **Control:** No description **Outcome:** Continuous and point prevalence abstinence (bio-verified by CO<10ppm), expired CO levels, self-reported cigarettes per day	- **Limitations:** Almost completely male smoker, small sample size, short follow-up, insufficient details regarding population of control group. Control group had no intervention
Dalack 1999 NRCT, n=10	**Location:** USA **Setting:** Outpatient	DSM-III-R criteria for schizophrenia or schizoaffective disorder, moderate to severe nicotine dependence, absence of current non-nicotine substance use disorder, no history of serious medical illness **Motivation:** Not trying to cut down or quit	**Intervention:** NRT patch (22mg/day) **Control:** Placebo patch **Outcome:** Self-reported number of cigarettes per day, expired CO levels	- **Limitations:** Population not trying to cut down or quit, short follow-up, small sample size, not randomised
Hartman 1991 RCT, n=14	**Location:** USA **Setting:** In-patient and outpatient	Psychiatric patients voluntary receiving psychiatric service, smoked at least 10 cigarette per day, free of substantial cardiovascular disease and pulmonary disease, no current substance use disorder **Motivation:** Did not have to indicate any desire to quit	**Intervention:** 24μl solution containing 30% nicotine base (8mg) **Control:** 24μl solution containing water **Outcome:** Observed number of cigarette butts smoked	++ **Limitations:** Very short follow-up, lack of bio-verified outcome
Hill 2007 NRCT, n=9	**Location:** USA **Setting:** Outpatient	Smokers, aged 22-65 years, smoked at least 15 cigarettes per day, with major depressive disorder **Motivation:** Interested in smoking cessation	**Intervention:** NRT patches (14mg/day) + CBT **Control:** Not treatment + CBT **Outcome:** Self-reported number of cigarettes smoked per day	- **Limitations:** Small sample size, lack of randomisation, high attrition, lack of objective outcome, short term follow-up
Thorsteinsson 2001 RCT, n=38	**Location:** USA **Setting:** Outpatient	18+ years of age, un-medicated outpatient, cigarette smoker with major depression without psychotic features as specified in the DSM-III-R, ≥14 on Hamilton Rating Scale for Depression, ≥1 cigarette pack/day for at least one year, biochemically confirmed	**Intervention:** NRT patches (21mg/day) **Control:** placebo patch **Outcome:** Self-reported smoking, withdrawal	+ **Limitations:** Drop-out rate substantially higher in placebo (50%) than intervention group (22%), underpowered study, lack of objective measure of

		CO≥15ppm, willingness to comply with study demands **Motivation:** Motivation to quit,		abstinence, short follow-up
Williams 2007 RCT, n=51	**Location:** USA **Setting:** Outpatient	Participants with schizophrenia or schizoaffective disorder **Motivation:** Wanted to quit smoking	**Intervention:** NRT patch (42mg/day) **Control:** NRT patch (21mg/day) **Outcome:** Point prevalence abstinence (7 day), time to first relapse to smoking	+ **Limitations:** Insufficient information in abstract regarding population and methods, short follow-up, small sample size

VARENICLINE

Dutra 2012 (UBA, USA, -) An uncontrolled before and after study was conducted to assess the effectiveness of varenicline in 102 outpatients diagnosed with schizophrenia or schizoaffective disorder, who were willing to set a quit date within the next 2-3 weeks. All participants received varenicline at a dose of 0.5mg per day for three days, then 0.5mg twice/day for four days, and 1mg twice/day for 11 weeks. Patients also received group cognitive behavioural therapy intended to promote smoking cessation for 12 weekly one-hour sessions.

SMOKING CESSATION OUTCOMES

The study demonstrated 60.4% achieved 14-day point prevalence abstinence at 12 weeks (bio-verified with CO<9ppm).

Panchas 2012 (UBA, USA, -) An uncontrolled before and after study was conducted to assess the effectiveness of varenicline in 112 outpatients diagnosed with schizophrenia or schizoaffective disorder, who had a desire to quit smoking. All participants received varenicline at a dose of 0.5mg per day for three days, then 0.5mg twice/day for four days, and 1mg twice/day for 11 weeks. Patients also received weekly one-hour manualised cognitive behavioural therapy for smoking cessation which had been tailored for people with schizophrenia.

SMOKING CESSATION OUTCOMES

The study demonstrated 47.3% achieved at least 2 weeks continuous abstinence and 34% achieved at least 4 weeks continuous abstinence at week 12 (bio-verified with CO<9ppm). Significant reductions in expired CO levels were also demonstrated from baseline to week 12 ($p<0.01$).

Smith 2009 (UBA, USA, -) An uncontrolled before and after study was conducted to assess the effectiveness of varenicline in 14 male in-patients and outpatients diagnosed with schizophrenia or schizoaffective disorders, of which most did not have a strong preference to definitely cease smoking. All participants received no intervention for 3 to 4 weeks before treatment commenced. Varenicline was given at doses for 0.5-1mg/day during the first week of treatment, increasing to 1mg twice/day for weeks 2-5 of treatment. Doses could be reduced if necessary to 1mg/day for side effects. Participants then received no interventions for 3 weeks.

SMOKING CESSATION OUTCOMES

The study demonstrated no significant difference in the number of cigarettes smoked per day between the before and after phases of the trial (mean, 36.5 versus 12.5 cigarettes/day; $p=0.12$). However, significant differences were seen between the before and after phases of the trial for expired CO levels (mean 8.97 versus 4.85ppm; $p=0.005$) and plasma cotinine levels (mean, 238.6 versus 129.8; $p=0.001$).

Weiner 2011a (RCT, USA, +) A randomised controlled pilot trial was conducted to assess the effectiveness of varenicline in 9 outpatients who had symptomatic schizophrenia or schizoaffective disorders. Participants were randomised to varenicline (1mg twice per day), or placebo, for 12 weeks. All of the participants received individual smoking cessation counselling. Participants had two counselling session before starting study treatments at week 0. The target quit date was following their week 1 visit at the end of the third counselling session.

SMOKING CESSATION OUTCOMES

The study demonstrated no significant difference in continuous abstinence (weeks 8-12, bio-verified with expired CO) between the participants taking varenicline compared to placebo (75% versus 0%; p=0.14). However, expired CO levels were significantly lower in the varenicline group compared to placebo after 4 weeks of medication till the end of the trial (p=0.02).

EVIDENCE STATEMENTS

ES10.1 There is weak evidence from four trials (**Dutra 2012 [UBA, USA, -]; Panchas 2012 [UBA, USA, -]; Smith 2009 [UBA, USA, -]; Weiner 2011a [RCT, USA, +]**) that varenicline (2mg/day), in predominately outpatients with schizophrenia or schizoaffective disorders, may reduce smoking consumption, where significant reductions were seen in expired CO levels in three studies (**Panchas 2012 [UBA, USA, -]; Smith 2009 [UBA, USA, -]; Weiner 2011a [RCT, USA, +]**); however, no significant difference was seen in continuous abstinence (bio-verified by expired CO) in one trial as compared to placebo (**Weiner 2011a [RCT, USA, +]**).

The evidence from four studies on varenicline is directly applicable to the UK setting as the intervention reflects current clinical prescribing practice in the UK for smoking cessation, and could be feasible within populations with mental health disorders. All of the four studies studies were conducted in the USA.

Table 10 Summary evidence table for varenicline

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Dutra 2012 UBA, n=102	**Location:** USA **Setting:** Outpatient	DSM-IV criteria for schizophrenia or schizoaffective disorder by SCID interview and chart review, clinically stable, stable dose of antipsychotic medication for at least one month, not acutely at risk of suicide, at least 10 cigarettes smoked per day for 6 months, expired CO level>9ppm or salivary cotinine>20ng/ml **Motivation:** Willing to set a quit date within the next 2-3 weeks	**Intervention:** Varenicline (2mg/day) **Control:** Baseline, no intervention **Outcome:** 14 day point prevalence at 12 weeks	- **Limitations:** Small sample size, concurrent administration of varenicline and cognitive behavioural therapy, no control group, concurrent medications for schizophrenia
Pacras 2012 UBA, n=112	**Location:** USA **Setting:** Outpatient	DSM-IV,-TR diagnosis of schizophrenia or schizoaffective disorder, smoked at least 10 cigarettes per day, stable dose of antipsychotic medication for at least one month, expired CO>9ppm **Motivation:** Desire to quit smoking	**Intervention:** Varenicline (2mg/day) **Control:** Baseline, no intervention **Outcome:** At least 2 weeks biochemically verified continuous abstinence, at least 4 weeks biochemically verified continuous abstinence, at 12 weeks	- **Limitations:** Small sample size, no control group, many participants terminated treatment early (33%)
Smith 2009 UBA, n=14	**Location:** USA **Setting:** In-patient and outpatient	Schizophrenia or schizoaffective disorder, long history of smoking cigarettes **Motivation:** Agreed to trial antismoking drug for cigarette	**Intervention:** Varenicline (2mg/day) **Control:** Baseline, no intervention **Outcome:** Number of cigarettes smoked per day, expired CO levels	- **Limitations:** Small sample size, lack of direct placebo control, in-patient hospital setting with smoking restrictions, lack of

		smoking habit although most did not have a strong personal desire to definitely stop smoking		uniformly strong desire to quit smoking, lack of randomisation, short follow-up, lack of abstinence outcome
Weiner 2011a RCT, n=9	**Location:** USA **Setting:** Outpatient	DSM-IV-TR criteria for schizophrenia or schizoaffective disorder for over 3 years, clinically stable, but still symptomatic, regular smoker at least 10 cigarettes smoked per day, smoked for at least one year, FTND score≥4 **Motivation:** Not reported	**Intervention:** Varenicline (2mg/day) **Control:** Placebo **Outcome:** Continuous smoking abstinence (week 8-12, bio-verified by CO≤10ppm), expired CO levels	+ **Limitations:** Small sample size

COMBINATION PHARMACOTHERAPIES

NICOTINE REPLACEMENT THERAPY AND BUPROPION

Saxon 2003 (NRCT, USA, -) A non-RCT was conducted to assess the effectiveness of NRT as compared to bupropion and the combination of NRT and bupropion in 115 outpatients who were diagnosed with an Axis 1 psychiatric disorder who were motivated to quit smoking. Eligible psychiatric disorders included PTSD, major depression, psychotic disorder, bipolar, and other anxiety disorders; 75% of participants additionally had substance dependence. Participants attended a smoking cessation program consisting of weekly group sessions followed by weekly group sessions with expired CO monitoring, and were expected to attend a minimum of 8 sessions. The content of the sessions focused on psycho-education and relapse prevention. Treatment assignment (no pharmacotherapy, NRT patches [21mg/day], bupropion SR [150mg/day for 3 days increasing to 150mg twice/day], or combination of the two was given based on the participants and clinicians' preferences, with the dosage adjusted to participant's response and side effects.

SMOKING CESSATION OUTCOMES

The study demonstrated participants who received the combination treatment were significantly more likely to have a greater reduction in the self-reported number of cigarettes smoked per day ($p=0.004$) and expired CO levels ($p<0.001$) than compared to the other treatment groups.

Culhane 2008 (RCT, USA, -) The findings from two RCTs were amalgamated and reported to assess the effectiveness of NRT in combination with bupropion in a total of 114 outpatients diagnosed with schizophrenia or schizoaffective (depressive type) disorders, who were willing to set a quit date within four weeks of enrolment. All participants received 12 weekly sessions of CBT as part of a smoking cessation group programme. Participants were randomised to receive bupropion SR (150mg twice per day); a combination of bupropion SR (150mg twice a day) and NRT patch (21mg/day for 4 weeks, decreasing to 7mg/day for 2 weeks, then 7mg/day for 2 weeks; additionally, 2mg of NRT gum could be used as required up to 9 pieces per day); or placebo. The placebo group also consisted of an extra 10 participants who were not medically eligible for bupropion SR (and thus could not be randomised), but who received open NRT patches and CBT as describe above.

SMOKING CESSATION OUTCOMES

The amalgamated findings from the two studies reported no significant differences in continuous abstinence (weeks 9-12, bio-verified by CO<9ppm) between the treatment groups; however, a re-analysis focusing on comparing the combination group and placebo groups, found the combination of bupropion and NRT patches were significantly more likely to be abstinent (weeks 9-12, bio-verified by CO<9ppm) compared to placebo (OR 9.16, 95% CI 1.02-82.2; $p=0.04$); however, no significant difference in abstinence (week 9-12, bio-verified by CO<9ppm) was detected for single treatment of bupropion or NRT patches compared to placebo (OR 5.27, 95% CI 0.64-43.2; $p=0.16$).

George 2008 (RCT, USA, ++) A RCT was conducted to assess the effectiveness of bupropion given in combination with nicotine replacement therapy in 59 outpatient participants with schizophrenia

or schizoaffective disorders. All participants received nicotine replacement therapy patches (21mg/24 hours) which were applied at day 15 to coincide with the target quit date. Participants were randomised to receive bupropion SR (initially 150mg/day orally once a day for 3 days, increasing to 150mg twice a day), or a matching placebo, until day 70.

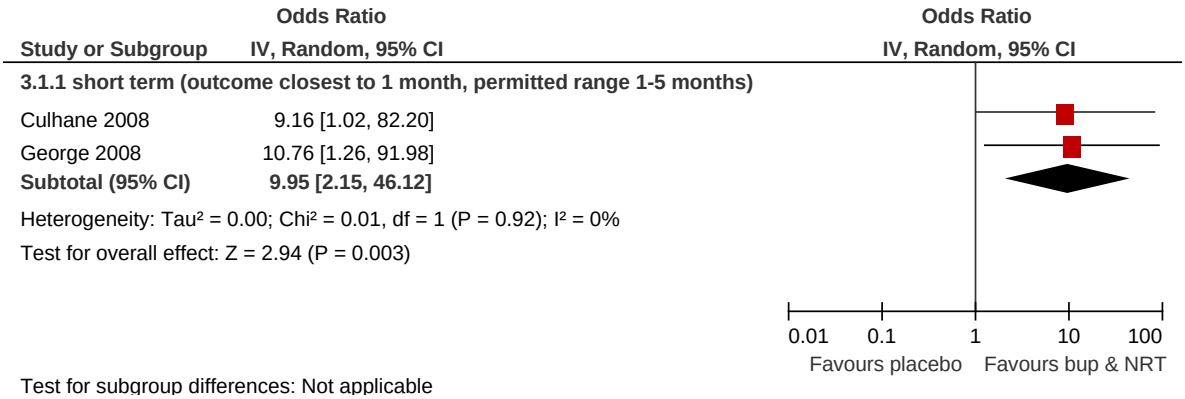
SMOKING CESSATION OUTCOMES

The study demonstrated participants randomised to bupropion were significantly more likely to achieve continuous abstinence (days 43 to 70, bio-verified by expired CO) compared to the placebo group (27.6% versus 3.4%; OR 10.76, 95% CI 1.24 to 91.98; p<0.03). However, in terms of long term point prevalence abstinence at day 70, no significant difference was seen between the groups (13.8% versus 0%; p=0.11).

META-ANALYSIS FOR COMBINATION OF NICOTINE REPLACEMENT THERAPY AND BUPROPION

A random effects meta-analysis was conducted to assess the pooled effects of the combination of bupropion and NRT on smoking cessation. The pooled result from two trials demonstrated the combination of bupropion and NRT was significantly effective for short term smoking cessation (pooled OR 9.95, 95% CI 2.15-46.12, I^2=0%; Figure 7).

Figure 7 **Meta-analysis of combination of bupropion and NRT for smoking cessation in schizophrenia**



EVIDENCE STATEMENTS

ES11.1 There is very weak evidence from one trial (**Saxon 2003 [NRCT, USA, -]**) to suggest the combination of bupropion (300mg/day) and NRT (21mg/day) is effective for reducing smoking consumption and expired CO levels compared to mono-therapy or no pharmacotherapy in 115 psychiatric outpatients in the short term.

ES11.2 There is moderate evidence from a pooled analysis of two trials (**George 2008 [RCT, USA, ++]; Culhane 2008 [RCT, USA, -]**) to suggest the combination of bupropion (300mg/day) and NRT (21mg/day) is effective for smoking cessation in the short term in outpatients with schizophrenia (Pooled OR 9.95, 95% CI 2.15-46.12). However, there is moderate evidence from one trial (**George 2008 [RCT, USA, ++]**) to suggest the combination of bupropion (300mg/day) and NRT (21mg/day) is not effective for smoking cessation in the long term in 59 outpatients with schizophrenia.

The evidence from the studies based on the combination treatment of bupropion with NRT is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. All of the studies were conducted in the USA.

Table 11 Summary evidence table for combination of bupropion with NRT

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Culhane 2008 RCTs, n=not reported	**Location:** USA **Setting:** Outpatient	Adults with schizophrenia or schizoaffective disorder (depressive type), DSM-IV criteria, stable symptoms, stable dose of antipsychotic medication for 30 days, smoked 10+ cigarettes per day **Motivation:** Willing to set quit date within 4 weeks of enrolment	**Intervention 1:** Bupropion SR (300mg/day) + CBT **Intervention 2:** Bupropion SR (300mg/day) + CBT + NRT patch (initiated on quit date) 21 mg/day for 4 weeks, decreasing to 14mg/day for 2 weeks, decreasing to 7 mg/day for 2 weeks). NRT gum (2mg used a required up to 9 pieces per day) **Control:** Placebo (no further description). **Outcome:** Continuous abstinence (week 9-12, bio-verified by CO<9ppm)	- **Limitations:** Small sample size, small number achieving continuous abstinence, not generalisable to larger population of outpatients with schizophrenia who are trying to stop smoking, short follow-up, methods unclear, influence of extra 10 participants not clear
Saxon 2003 UBA, n=115	**Location:** USA **Setting:** Outpatient	Dual diagnosis of alcohol and drug dependence, 74.8% had Axis I psychiatric diagnosis in addition to substance dependence **Motivation:** Motivated to quit but not required to set a target quit date	**Intervention:** Compares NRT, bupropion and combination of NRT and bupropion, no doses or lengths of treatment described, doses based on response and side effect experience **Control:** N/A **Outcome:** Self-reported number of cigarettes smoked per day, expired CO levels	- **Limitations:** Lack of control group, heterogeneity of participants in regards to baseline diagnoses and medications, non-blinded treatment assignment, lack of data on drop outs, lack of randomisation, short follow-up, insufficient information regarding doses of treatments given
George 2008 RCT, n=59	**Location:** USA **Setting:** Outpatient	SCID-IV criteria for schizophrenia or schizoaffective disorder, nicotine dependence, 10+ cigarettes per day, CO≥10ppm, clinically stable, total PANSS score<70 at study entry, stable	**Intervention:** Bupropion (300mg/day) + NRT patches (21mg/day) + smoking cessation therapy **Control:** Placebo + NRT patches (21mg/day) + smoking cessation therapy **Outcome:** Continuous abstinence (day 43-70), point prevalence abstinence (day 70 and 6 months)	++ **Limitations:** Small sample size, lack of applicability to typical outpatient smoker with schizophrenia since participants were highly motivated to quit

		dose of antipsychotic medication for at least one month and continued on same medication during trial **Motivation:** Baseline motivation quit scale indicating willingness to quit in next 30 days or less on contemplation ladder		

COMBINATION OF BEHAVIOURAL THERAPIES AND PHARMACOTHERAPIES

HIGH INTENSITY BEHAVIOURAL THERAPY AND BUPROPION

Weiner 2001 (UBA, USA, -) An uncontrolled before and after study was conducted to assess the effectiveness of bupropion with high intensity behavioural support for smoking reduction in 9 outpatients diagnosed with schizophrenia or schizoaffective disorders. Following a 2 week stabilisation period where no treatment was delivered, participants then received 9 weekly sessions of group therapy, and adjunctive bupropion therapy SR was started on the third week of group therapy (dose of 150mg once/day for 3 days, increasing to 150mg twice/day for 12 weeks), over a 14 week period.

SMOKING CESSATION OUTCOMES

The study demonstrated a significant decrease in expired CO levels from baseline to week 14 (mean, 39.4 versus 18.4ppm; $p<0.05$).

EVIDENCE STATEMENT

ES12.1 There was very weak evidence from one trial (**Weiner 2001 [UBA, USA, -]**) to suggest the combination of high intensity behavioural therapy with bupropion significantly reduced smoking consumption in 9 outpatients with schizophrenia from baseline to short term follow-up (mean expired CO levels reduced from 39.4 to 18.4 ppm).

The evidence from the individual study on the combination of high intensity behavioural therapy with bupropion is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. The study was conducted in the USA.

Table 12 Summary evidence table for combination of high intensity behavioural therapy with bupropion

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Weiner 2001 UBA, n=9	**Location:** USA **Setting:** Outpatient	DSM-IV schizophrenia or schizoaffective disorder, medically stable, stable cigarette smoking habits, high nicotine dependence **Motivation:** Expressed interest in decreasing their smoking,	**Intervention:** 14 week treatment period – 9 sessions of weekly group therapy + bupropion (300mg/day) **Control:** 2 week stabilisation period (baseline) **Outcome:** Expired CO levels	- **Limitations:** Small sample size, open-label design, lack of strict inclusion criteria regarding smoking consumption, lack of randomisation, lack of control group, lack of abstinence as an outcome, incorrect statistical analysis performed

HIGH INTENSITY BEHAVIOURAL THERAPY AND NICOTINE REPLACEMENT THERAPY

Baker 2006 (RCT, Australia, +) A RCT was conducted to assess the effectiveness of a high intensity behavioural therapy programme with NRT in 298 in-patients and outpatients with a diagnosis of a non-acute psychotic disorder (57% had schizophrenia or schizoaffective disorders), who had an interest in quitting smoking. The high intensity behavioural therapy programme consisted of 8 one hour individual sessions on motivational interviewing and CBT, and participants randomised to this group could also use NRT (21mg for 6 weeks, decreasing to 14mg for 2 week, then 7mg for 2 weeks) in addition to the treatment given to the control group. Participants in the control group receive treatment as usual which included access to their general practitioner and publicly funded community health teams; additionally, participants received booklets on smoking cessation.

SMOKING CESSATION OUTCOMES

The study demonstrated no significant difference between the high low intensity behavioural therapy programme with NRT and the low intensity programme on continuous abstinence (bio-verified by expired CO<10ppm) at three months (OR 2.95, 95% CI 0.83-10.53), 6 months (OR 2.84, 95% CI 0.48-16.67), or 12 months (OR 5.28, 95% CI 0.31-90.20) follow-up. Similar non-significant findings were seen for 7 day point prevalence abstinence (3 months, OR 2.78, 95% CI 0.96-8.07; 6 months, OR 2.54, 95% CI 0.70-9.28; 12 months, OR 1.72, 95% CI 0.58-5.09). However, participants in the high intensity programme with NRT were significantly more likely to have reduced their smoking by 50% or more relative to baseline at 3 months (OR 3.89, 95% CI 1.9-7.89) and 12 months (OR 2.09, 95% CI 1.03-4.27); but no significant effect was seen at 6 months follow-up (OR 1.88, 95% CI 0.92-3.82).

Baker 2009 (NRCT, Australia, -) A non-randomised uncontrolled before and after study was conducted to assess the effectiveness of motivational interviewing, CBT, plus NRT in 48 outpatients with a diagnosis of a non-acute psychotic disorder (79% had schizophrenia or schizoaffective disorders). Following the baseline phase of the trial, participants received 6 weekly sessions (1 hour duration each) and 3 fortnightly booster sessions, of a healthy lifestyle intervention programme which used motivational interviewing and CBT delivered individually to participants. Additionally, up to 42mg NRT was provided by per day. Follow-up was at a mean of 19.6 weeks following the commencement of treatment.

SMOKING CESSATION OUTCOMES

The study demonstrated significant reductions in the number of cigarettes smoked per day from baseline to post-treatment assessment (mean 30.8 versus 17.2; p<0.001). 11.6% of the participants were continuously abstinent (bio-verified with expired CO levels<10ppm), and 18.6% achieved 7 day point prevalence abstinence, from quit date to the post-treatment assessment.

Barnett 2008 (RCT, USA, +) A RCT was conducted to assess the cost-effectiveness of a high intensity behavioural intervention with NRT in 322 outpatients with a current diagnosis of uni-polar depression who were being treated for their disorder. Participants were randomised to either a high

intensity behavioural therapy programme with NRT (dose not stated) (programme called 'stepped care'), or brief contact, and assessed over an eighteen month period. The stepped care programme initially consisted of three scheduled assessments to identify which participants were ready to quit smoking. Once participants were identified as contemplating quitting, or wanted treatment, 6 sessions of psychological counselling and up to 10 weeks of NRT patches were given. In those who continued to smoke after this treatment, participants were offered bupropion and two additional counselling sessions. Participants in the control group received a printed stop smoking guide and a list of smoking cessation programme.

SMOKING CESSATION OUTCOMES

The study demonstrated participants who received stepped care were more likely to be abstinent from smoking at the end of the 18 months follow-up than those in the brief contact group (7 day point prevalence, bio-verified by CO<10ppm) 24.6% versus 19.1%; p value not reported).

EVIDENCE STATEMENTS

ES13.1 There is moderate evidence from one trial of 298 in-patients and outpatients with a diagnosis of non-acute psychotic disorders (**Baker 2006 [RCT, Australia, +]**) to suggest high intensity behavioural therapy (CBT with motivational interviewing) in addition to NRT (21mg/day) resulted in no significant effect on continuous smoking abstinence (bio-verified by CO<10ppm) at short (OR 2.95, 95% CI 0.83-10.53), medium (OR 2.84, 95% CI 0.48-16.67) and long (OR 5.28, 95% CI 0.31-90.20) term follow-ups.

ES13.2 There is weak evidence from two trials in participants with a diagnosis of non-acute psychotic disorders (**Baker 2006 [RCT, Australia, +]; Baker 2009 [NRCT, Australia, -]**) that high intensity (CBT with motivational interviewing) in addition to NRT (21mg/day or up to 42mg/day) reduced self-reported cigarette consumption. In one trial (**Baker 2006 [RCT, Australia, +]**) a 50% or more reduction in cigarette consumption was seen in the short (OR 3.89, 95% CI 1.9-7.89) and long (OR 2.09, 95% CI 1.03-4.27) term, but not at medium term follow-up (OR 1.88, 95% CI 0.92-3.82). In the other trial (**Baker 2009 [NRCT, Australia, -]**) a significant reduction in the number of cigarettes smoked per day was seen from baseline to short term follow-up (mean reduction from 30.8 to 17.2 cigarettes/day).

ES13.3 There is weak evidence from one trial of 322 outpatients with a diagnosis of depression (**Barnett 2008 [RCT, USA, +]**) to suggest high intensity behavioural support in addition to NRT (dose not stated) (and an offer of bupropion in those who continued to smoke) resulted in a higher proportion of participants being abstinent at long term follow-up (7 day point prevalence, bio-verified by CO<10ppm, 24.6% versus 19.1%, p value not reported).

The evidence from the studies on the combination of high intensity behavioural therapy with NRT is directly applicable to the UK setting as the intervention reflects current clinical prescribing practice

in the UK for smoking cessation, and could be feasible within populations with mental health disorders. Two of the studies were conducted in Australia which has a similar smoking treatment service to the UK; the remaining study was conducted in the USA.

Table 13 Summary evidence table for combination of high intensity behavioural therapy with NRT

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Baker, 2006 RCT, n=298	**Location:** Australia **Setting:** Outpatient	Smokers with non-acute psychotic disorders, 18+ years, 15+ cigarettes per day, ICD 10 diagnosis of psychotic disorder **Motivation:** not reported	**Intervention:** Eight one hour individual sessions of motivational interviewing and CBT plus NRT in addition to treatment as usual **Control:** Treatment as usual included access to general practitioner and publicly funded community health teams **Outcome:** Continuous abstinence (bio-verified by expired CO<10ppm), point prevalence smoking abstinence, smoking reduction	+ **Limitations:** No control for therapy time
Baker 2009 UBA, n=48	**Location:** Australia **Setting:** Outpatient	18+ years, 15+ cigarettes per day, ICD 10 diagnosis of non-acute psychotic disorder **Motivation:** Not reported	**Intervention:** Nine sessions of treatment programme based on healthy lifestyle intervention with motivational interviewing **Control:** Pre-treatment programme baseline, no intervention	- **Limitations:** Absence of control group, no longer term follow-up, UBA study, different length of time for before and after phases
Barnett 2008 RCT, n=322	**Location:** USA **Setting:** Outpatient	Current diagnosis of uni-polar depressions, smoked at least one cigarette per day **Motivation:** Participants did not need to be interested in quitting smoking	**Intervention:** Stepped care: Six sessions of psychological counselling and up to 10 weeks of NRT with dermal patch. Those who continued to smoke after this treatment were offered bupropion SR and two additional counselling sessions **Control:** Brief contact: receive printed top-smoking guide and a list of smoking cessation programmes from the smoking study staff **Outcome:** Point prevalence abstinence (7 day, bio-verified by CO<10ppm)	+ **Limitations:** Insufficient methods about the trial was the paper focuses on cost-effective rather than effectiveness of treatment

COMBINATION OF CONTINGENCY PAYMENTS AND PHARMACOTHERAPIES

CONTINGENCY PAYMENTS AND BUPROPION

Tidey 2011 (RCT, USA, ++) A randomised controlled four-arm trial was conducted to assess the effectiveness of contingency payments in addition to bupropion SR in 57 outpatients with a diagnosis of schizophrenia or schizoaffective disorder, who indicated they planned to quit smoking in the next 6 months. Participants were randomised to receive either contingency payments with bupropion (n=12), contingency payment with placebo (n=16), non-contingent payment with bupropion (n=11), or non-contingent payment with placebo (n=13). Contingency payments comprised of a $25 US gift card for attendance and an additional cash bonus of $5 US could be earned if urinary cotinine levels were reduced by 25% to the previous sample given or if the reading was <80ng/ml. Non-contingent payments comprised of a $25 US store card for attending the session and providing a urine sample, an additional cash bonus of $5 US was given regardless of the results of the urinary cotinine levels measured in the sample. Participants randomised to bupropion were given bupropion SR 150mg/day orally for days 1-3, increasing to 150mg/day twice a day orally for days 4-22. A matching placebo was given orally for 22 days.

SMOKING CESSATION OUTCOMES

Bupropion did not significantly reduce smoking by itself or increase the effectiveness of the contingent payment intervention. However, the study did report that participants receiving contingent payments had lower cotinine levels ($p<0.001$), lower expired CO levels ($p<0.01$), and reduced number of cigarettes smoked per day ($p<0.01$) compared to non-contingent payments at weeks 3 and 4 compared to weeks 1 and 2. No significant difference was detected between the treatment groups for cigarette craving (Questionnaire on Smoking Urges, $p<0.05$).

EVIDENCE STATEMENT

ES14.1 There is moderate evidence from one trial (**Tidey 2011 [RCT, USA, ++]**) to suggest contingency payments given in addition to bupropion (300mg/day) did not significantly reduce smoking, or have a detrimental effect on cigarette craving, in 57 outpatients with schizophrenia.

The evidence from the individual study on the combination of contingency payments with bupropion is potentially applicable to the UK as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. The study was conducted in the USA.

Table 14 Summary evidence table for combination of contingency payments with bupropion

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Tidey 2011 RCT, n=57	**Location:** USA **Setting:** Outpatient	DSM-IV-TR diagnosis of schizophrenia or schizoaffective disorder, 18+ years of age, 20+ cigarettes per day, FTND score≥6, clinically stable psychoactive medication for at least 2 months **Motivation:** 4+ score on contemplation ladder indicating some interest in quitting in next 6 months	**Intervention 1:** Contingency payment with bupropion (300mg/day) **Intervention 2:** Contingency payment with placebo **Intervention 3:** Non-contingent payment with bupropion (300mg/day) **Control:** Non-contingency payment with placebo **Outcome:** Number of cigarettes smoked in past week, cotinine levels	++ **Limitations:** Short treatment period, small sample size, self-reported compliance of medication

CONTINGENCY PAYMENTS AND NICOTINE REPLACEMENT THERAPY

Tidey 2002 (NRCT, USA, -) A non-randomised within-subject repeated measures design was conducted to assess the effectiveness of monetary payments for smoking reduction with NRT in 17 outpatients diagnosed with schizophrenia or schizoaffective disorders, who were not actively trying to quit smoking during the study. Three conditions were tested within the participants; i) contingency payment with NRT patch (21mg/24 hours); ii) contingency payment with placebo patch; iii) non-contingent payment with placebo patch. The sequence of assignment to the three conditions was ordered across the participants to ensure similar numbers of participants were exposed to the conditions at each phase of the study. The patch condition was applied the day before the contingency payment condition was commenced, and participants received $10 US for attending this visit. Visits were then made three times a day for the next 5 days. Participants in the contingency payment condition who met the cut-off for expired CO levels≤11ppm at each visit received $3 US for their first reading, increasing by $0.50 for each subsequent reading below the cut-off, with a bonus $10 US for every third consecutive reading below the cut-off. Thus, the maximum total available cash that could be received was $147.50 US. Participants in the non-contingent payment condition receive $9.80 per visit regardless of their expired CO levels, so that the total cash received for this condition match that from the contingency payment condition.

SMOKING CESSATION OUTCOMES

The study demonstrated significantly different mean expired CO level between the three conditions (mean, contingency payment with NRT 19.4ppm versus contingency payment with placebo 20.5ppm versus non-contingent payment with placebo 28.0ppm; $p<0.05$). Post-hoc analyses indicated significantly higher expired CO levels in the non-contingent payment with placebo group than compared to contingency payment with placebo or contingency payment with NRT; however, no significant differences were seen between the contingency payment conditions with NRT and contingency payment with placebo. Salivary cotinine levels were significantly different between the three conditions ($p<0.05$); with post-hoc analyses revealing significantly higher levels in the non-contingent payment with placebo and contingency payment with NRT compared to contingent payment with placebo. Significant differences in nicotine withdrawal was seen between the three conditions with significantly lower levels being observed in the non-contingent payment with placebo condition than compared to the other two conditions (assessed using the Minnesota Nicotine Withdrawal Scale). No significant differences between the conditions was seen for anticipation of immediate positive outcome from smoking subscale and for anticipation of relief from negative affect relating to nicotine withdrawal subscale (Questionnaire on Smoking Urges).

Gallagher 2007 (RCT, USA, -) A randomised controlled three-arm trial was conducted to assess the effectiveness of contingency payments in addition to NRT in 180 outpatients who had schizophrenia or schizoaffective disorder that resulted in long term illness. Participants didn't have to commit to quitting, but 48% expressed an interest, and 50% were interested in reducing smoking consumption. Participants were randomised to contingency payments with NRT, contingency payments only, or a minimal self-quit intervention group. Contingency payments comprised of the participants earning $25 US for completing the baseline and follow-up visits, and $5 US for each regular visit; additionally, they could earn bonus payments for each visit if their expired CO level was <10ppm ($20 US for weeks 2-4, $40 US for bimonthly visits week 6-12, $60US for monthly visits weeks 16-24, and $80 US for follow-up visit at week 36; total of 12 visits). NRT patches were given at a dose of 21mg for 16 weeks from baseline. The self-quit intervention group had a minimal (brief advice) intervention which comprised of 3 visits, in which they were encouraged to use available community resources and received smoking cessation literature focusing on tobacco and cessation related education and motivational support, and were allowed to use NRT patches (21mg for 16 weeks).

SMOKING CESSATION OUTCOMES

The study demonstrated abstinence (bio-verified by expired CO≤10ppm) at week 20 was significantly more likely in participants receiving contingency payments (OR 11.59, 95% CI 3.23-41.61) and participants receiving contingency payments with NRT (OR 13.73, 95% CI 3.85-49.03) compared to the self-quit intervention group (p=0.001). Similar significant findings were also seen at week 36 (contingency payments, OR 4.37, 95% CI 1.49-12.81; contingency payments with NRT, OR 7.87, 95% CI 2.72-22.79; compared to self-quit intervention group, p=0.001). However, when abstinence was bio-verified by saliva cotinine levels (<15ng/ml), contradictory findings were reported where no significant difference was seen at week 20 (p=0.08) or at week 36 (p=0.92); however, it should be noted that salivary cotinine levels are higher than a non-smokers when NRT patches are used, therefore this is not an optimal method of bio-verification in this instance. Reduced smoking (based on cotinine levels, but definition of thresholds were not clear) was significantly more likely at week 20 in the contingency payment and contingency payment with NRT groups compared to self-quit intervention group (32% versus 12% versus 4%; p=0.02); however, no significant effect was seen at week 36.

EVIDENCE STATEMENTS

ES15.1 There is very weak mixed evidence from one trial of 180 outpatients with schizophrenia or schizoaffective disorders (**Gallagher 2007 [RCT, USA, -]**) regarding the effectiveness of contingency payments, given in addition to NRT (21mg/day), on abstinence compared to self-quit interventions in the short term and at medium term. Significant increases in smoking cessation were observed when abstinence was bio-verified by CO≤10ppm (short term, OR 13.73, 95% CI 3.85-49.03; medium term, OR 7.87, 95% CI 2.72-22.79). No significant effects were seen when abstinence was bio-verified by saliva cotinine<15ng/ml at short term or medium term follow-up; however, it should be noted that salivary cotinine levels are higher than a non-smokers when NRT patches are used, therefore this is not an optimal method of bio-verification in this instance.

ES15.2 There is very weak evidence from one trial of smoking reduction (**Tidey 2002 [NRCT, USA, -]**) to suggest contingency payments with NRT patches resulted in significantly reduced levels of cigarette/tobacco consumption in 17 outpatients with schizophrenia (measured using expired CO and salivary cotinine levels), but did not have an effect on the anticipation of an immediate positive outcome from smoking or on relief of nicotine withdrawal symptoms.

The evidence from the studies on the combination of contingency payments with NRT is potentially applicable to the UK setting as the intervention may be feasible to the UK setting; however, this does not reflect current clinical prescribing practice in the UK. Both studies were conducted in the USA.

Table 15 Summary evidence table for combination of contingency payments with NRT

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Gallagher 2007 RCT, n=180	**Location:** USA **Setting:** Outpatient	DSM-IV criteria for Axis I psychotic spectrum or affective disorder that resulted in long term illness, significant symptoms and functional impairments due to disorder. 18+ years, 10+ cigarettes per day, smoked for at least 3 years, expired CO>10ppm, saliva cotinine>15ng/ml, orally English **Motivation:** Didn't have to commit to quitting but 48% expressed an interest, and 50% were interested in reducing smoking consumption	**Intervention 1:** Contingent payment (earned progressively more money for each visit is expired CO<10ppm, $25 US for completing baseline and follow-up visits, and $5 US per regular visit, maximum of $580 US over the trial) **Intervention 2:** Contingent payment (as above) with NRT patches (21mg) **Control:** Self-quit (minimal intervention) **Outcome:** Point prevalence abstinence (bio-verified by expired CO≤10ppm)	- **Limitations:** Attrition high, quit rates low, small sample size, non-blinding of research staff and outcome assessors, length of treatment varied between intervention and control groups, those on NRT patches were told not to use patch if returned to smoking
Tidey 2002 NRCT (within participant), n=17	**Location:** USA **Setting:** Outpatient	Schizophrenia or schizoaffective disorder confirmed by board-certified psychiatrist, regular smoker, CO≥18ppm **Motivation:** Not actively trying to quit during study	**Intervention 1:** Contingency payments for smoking reduction with NRT patch (21mg/24 hours). Maximum total payment possible was $147.50 US **Intervention 2:** Contingency payments for smoking reduction with placebo patch. Maximum total payment possible was $147.50 US **Control:** Non-contingent payment and placebo patch. Participants received $9.80 US for each visit regardless of CO reading **Outcome:** Smoking reduction (bio-verified by CO≤11ppm)	- **Limitations:** Short term outcomes, small sample size, lack of randomisation

QUESTION 1B. HOW EFFECTIVE ARE INTERVENTIONS FOR TEMPORARY ABSTINENCE IN HELPING PEOPLE FROM THE POPULATION OF INTEREST?

No studies were identified which assessed the effectiveness of interventions for temporary abstinence in the population of interest.

EVIDENCE STATEMENT

ES16.1 No studies were identified which assessed the effectiveness of interventions for temporary abstinence in people with mental health illness.

SUBSIDIARY QUESTION 1A I) HOW DOES THE EFFECTIVENESS OF SMOKING CESSATION AND TEMPORARY ABSTINENCE INTERVENTIONS VARY BY MENTAL HEALTH DIAGNOSIS, GENDER, SEXUAL ORIENTATION, AGE, ETHNICITY, RELIGION, SOCIOECONOMIC STATUS, DISABILITY, AND BY POPULATIONS OF INTEREST (INCLUDING PATIENTS, HOUSEHOLD MEMBERS, VISITORS AND STAFF)?

The included studies only reported findings for two of the above categories, mental health diagnosis and age. All of the included studies assessed the effectiveness of smoking cessation treatments in patients, none of them focused on household members, visitors or staff.

MENTAL HEALTH DIAGNOSIS

The majority of the studies included in the review assessed the effectiveness of interventions for smoking cessation in participants with schizophrenia or schizoaffective disorders. Only a few studies looked at the effectiveness of interventions in different subgroups (PTSD [3 studies], bipolar [1 study], or major depression [4 studies]). None of the included studies directly compared the effectiveness in different populations; therefore further analysis of specific interventions by mental health diagnosis was not performed due to substantial differences in the protocols of the included studies.

AGE

All of the included studies except one looked at adult mental health populations; however none of these reported the effectiveness of treatments broken down into age categories. Only one study included in the review used a non-adult mental health population.

Brown 2003 (RCT, USA, +) assessed the effectiveness of motivational interviewing in 191 psychiatric in-patients aged 13-17 years who smoked at least one cigarette per week, using a RCT design. Eligible diagnoses included mood (n=84), anxiety (n=105), disruptive behaviour (n=150), and substance related (n=136) disorders (participants could have dual disorders); however, participants with current psychotic disorders were excluded. Participants were randomised to motivational interviewing or brief advice. The motivational interviewing group comprised two 45-minute individual therapy sessions during hospitalization. Following discharge patients were offered NRT patches if they desired to quit smoking and smoked 10+ cigarettes per day. The brief advice group received 5-10 minutes of smoking cessation advice by the study therapist and a self-help pamphlet, and following discharge they were also offered NRT patches if they desired to quit and smoked 10+ cigarettes per day.

SMOKING CESSATION OUTCOMES

The study demonstrated no significant difference between the treatment groups on the number of cigarettes smoked per day at 12 months follow-up (p=0.74). Additionally, 7 day point prevalence (bio-verified with expired CO<10ppm and saliva cotinine<15ng/ml) was not significantly difference at one month (11.0% versus 11.0%), 6 months (13.3% versus 8.5%), or 2 months (14.0% versus 9.9%) follow-up (all p>0.30). Over the 12 month follow-up, no significant difference was seen in the odds of abstinence between the treatment groups (OR 1.16, 95% CI 0.59-2.31; p=0.38); however, the study reported having an anxiety disorder was associated with a higher odds of abstinence (OR 4.71, 95% CI 2.19-10.12; p=0.0001). On discharge, participants in the motivational interviewing group had significantly higher self-efficacy (confidence in ability to refrain from smoking) compared to those receiving brief advice (p=0.04).

EVIDENCE STATEMENT

ES17.1 No studies were identified which assessed the differential effectiveness of smoking cessation interventions by mental health diagnosis, gender, sexual orientation, ethnicity, religion, socioeconomic status, disability, or in populations of interest other than patients (for example, household members, visitors or staff).

ES17.2 There is very weak evidence from one trial (**Brown 2003 [RCT, USA, -]**) to suggest high intensity behavioural therapy with NRT had no overall significant effect on smoking cessation in 191 adolescent psychiatric in-patients at short term and long (OR 1.16, 95% CI 0.59-2.31) term outcome timings.

The evidence from the individual study on high intensity behavioural therapy in adolescents is potentially applicable to the UK as there is no reason to assume that the interventions could not be implemented in UK outpatient and in-patient settings.

SUBSIDIARY QUESTION 1A II) ARE THERE DIFFERENCES IN THE EFFECTIVENESS OF SMOKING CESSATION AND TEMPORARY ABSTINENCE INTERVENTIONS BY DELIVERER, TIMING (OR POINT IN THE CARE PATHWAY), FREQUENCY, DURATION, AND SEVERITY OF DEPENDENCE, AND SETTING IN WHICH THE INTERVENTION IS ASSESSED, FOR EXAMPLE IN-PATIENTS VERSUS OUT-PATIENT?

The included studies only allowed for sensitivity analyses based on the setting in which the interventions were assessed, and the type of anti-psychotic medication used.

SETTING IN WHICH THE INTERVENTION IS ASSESSED

The majority of the included studies looked at out-patients populations (30 studies), 10 assessed in-patients population only, and three assessed the interventions in in-patients and outpatients. The setting was unclear in 6 of the included studies. However, comparisons in effectiveness of interventions could not be performed due to the differences in protocols between the studies which solely assessed in-patients and those assessing outpatients. In the three studies which assessed in-patients and outpatients the results were not compared between the two sub-populations.

TYPE OF ANTI-PSYCHOTIC MEDICATION USED

HIGH INTENSITY BEHAVIOURAL THERAPY

One study compared the effectiveness of the high intensity behavioural therapy by the type of anti-psychotic medication being used to treat schizophrenia or schizoaffective disorders.

George 2000 (quasi-RCT, USA, +) A quasi-RCT was conducted to assess the effectiveness of a specialised schizophrenia group therapy programme as compared to a standard therapy programme in 45 participants with schizophrenia or schizoaffective disorders who were motivated to quit smoking. All participants were given nicotine replacement therapy patches (21mg/24hr) for 6 weeks starting on the target quit date (week 3), decreasing to 14mg weeks 7-10, and 7mg weeks 11 and 12. The intervention group received weekly group therapy for 10 weeks, which was based on 3 weeks of motivational enhancement therapy, followed by 7 weeks of psycho-education, social skills training, and relapse prevention strategies. The control group received 7 weeks of manualised behaviour group therapy and supportive group counselling during the 3 remaining weekly group sessions, with each session lasting 60 minutes.

SMOKING CESSATION OUTCOMES

When comparing cessation outcomes according to patients' antipsychotic treatment regime, the study demonstrated that those taking atypical antipsychotic medication were significantly more likely to achieve abstinence at 12 weeks than compared to those on typical antipsychotic medication (55.6% versus 22.2%; $p<0.01$); however, the potential interaction between therapy programme assignment and type of antipsychotic medication was not statistically assessed.

BUPROPION

Three studies compared the effectiveness of the bupropion by the type of antipsychotic medication being used to treat schizophrenia or schizoaffective disorders.

Evins 2005 (RCT, USA, ++) A RCT was conducted to assess the effectiveness of bupropion in 57 outpatients diagnosed with schizophrenia or schizoaffective disorders, who were willing to set a smoking quit date. Participants were randomised to bupropion (150mg/day for 7 days, if medication was tolerated well, then dose increased to 150mg twice/day for 11 weeks), or placebo, for 12 weeks. All participants received 12 weekly sessions of CBT.

SMOKING CESSATION OUTCOMES

The study reported there was no significant effect of antipsychotic medications were seen on abstinence outcomes (atypical versus typical); however, no formal statistical assessment on the interaction between bupropion and type of antipsychotic medication was reported.

Evins 2007 (RCT, USA, ++) A RCT was conducted which assessed the effectiveness of bupropion in 51 outpatients diagnosed with schizophrenia, who were willing to set a smoking quit date. Participants were randomised to receive bupropion (150mg per day for 7 days, increasing to twice daily for 11 weeks), or placebo (using the regimen as the active group), for 12 weeks. All participants additionally received 12 one hour weekly smoking cessation programme sessions. Following setting a target quit date; all participants received NRT patches (21mg/day for 4 weeks, decreasing to 14mg/day for 2 weeks, decreasing to 7mg/2 weeks). NRT gum (2mg) was used as needed up to a maximum dose of 18mg/day.

SMOKING CESSATION OUTCOMES

No significant differences in continuous abstinence outcomes (bio-verified by CO) were seen by the type of antipsychotic medication being used by the participants (typical versus atypical).

George 2002 (RCT, USA, ++) A RCT was conducted to assess the effectiveness of bupropion in 32 outpatients with schizophrenia or schizoaffective disorders who expressed the desire to quit smoking. Participants were randomised to bupropion SR (initial dose 150mg orally daily for 3 days

increasing to 150mg orally twice per day), or matching placebo, for 10 weeks. All participants additionally received smoking cessation group therapy for 10 weeks on a weekly basis with each session lasting 60 minutes. The target quit date was during the 3rd group therapy session on week 3.

SMOKING CESSATION OUTCOMES

A subgroup analysis based on the type of antipsychotic medication was being used by the participants (atypical [ATP] or typical [TYP]) revealed those on atypical antipsychotic medication who received bupropion were significantly more likely to quit smoking at week 10 (bio-verified by CO<10ppm) as compared to the other groups (bupropion + ATP 66.7% versus bupropion + TYP 0% versus placebo +ATP 20% versus placebo + TYP 0%; p<0.01).

EVIDENCE STATEMENT

ES18.1 There is weak evidence from one trial (**George 2000 [quasi-RCT, USA, +]**) to suggest the effectiveness of high intensity behavioural therapy for smoking cessation was not significantly related to the type of antipsychotic medication used in schizophrenia.

ES18.2 There is contradictory strong evidence from three trials (**George 2002 [RCT, USA, ++]; Evins 2005 [RCT, USA, ++]; Evins 2007 [RCT, USA, ++]**) regarding the difference in effectiveness of bupropion for smoking cessation by the type of antipsychotic medication used in schizophrenia.

The evidence from the studies is potentially applicable to the UK as the interventions are feasible within the UK setting.

SUBSIDIARY QUESTION 1A III) WHAT ARE THE ADVERSE EVENTS AND OTHER CONSEQUENCES ASSOCIATED WITH USING SMOKING CESSATION AND TEMPORARY ABSTINENCE INTERVENTIONS IN THE POPULATIONS OF INTEREST?

ADVERSE EVENTS

Adverse events were primarily reported in studies which assessed the effectiveness of a pharmacological medication; however, not all trials assessing pharmacological intervention reported adverse events. Only 21 of the studies included in the review reported details regarding adverse events, which are categorised into behavioural and pharmacological interventions, and summarised below.

ADVERSE EVENTS RELATING TO HIGH INTENSITY BEHAVIOURAL THERAPY INTERVENTIONS

Only one of the studies included in the review assessed the adverse events of high intensity behavioural therapy for smoking cessation.

POST-TRAUMATIC STRESS DISORDER

McFall 2010 (RCT, USA, ++) reported no significant differences were observed between the integrated care or usual standard of care groups in 943 outpatients under PTSD care (p=0.49), relating to psychiatric hospitalisations, life-threatening or potentially jeopardising psychiatric conditions not resulting in hospitalisation, and cardiac or gastrointestinal related events.

EVIDENCE STATEMENT

ES19.1 There was moderate evidence from one trial (**McFall 2010 [RCT, USA, ++]**) to suggest smoking cessation arising from using high intensity behavioural therapy does not result in any adverse effects relating to psychiatric hospitalisation, cardiac or gastrointestinal related events in 943 outpatients with PTSD.

This evidence is applicable to the UK setting.

ADVERSE EVENTS RELATED TO BUPROPION

Twelve studies included in the review assessed the adverse events of bupropion.

SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDER

Bloch 2010 (RCT, Israel, –) assessed the effectiveness of bupropion (300mg) in 61 outpatients with a diagnosis of schizophrenia or schizoaffective disorder. The study did not report adverse events in the paper; however the authors stated that participant drop out was not related to side effects.

Evins 2001 (RCT, USA, +) assessed the effectiveness of bupropion (150mg) in 18 outpatients diagnosed with schizophrenia. The study reported there were no serious adverse events during the trial.

Evins 2005 (RCT, USA, ++) assessed the effectiveness of bupropion (300mg) in 57 outpatients diagnosed with schizophrenia or schizoaffective disorders. The study reported three serious adverse events during the trial which required discontinuation of study treatment. One participant had an allergic reaction to bupropion resulting in hives, urticaria, and wheezing. Two participants in the placebo group experienced suicide ideation during the trial.

Evins 2007 (RCT, USA, ++) assessed the effectiveness of bupropion (300ng) in 51 outpatients diagnosed with schizophrenia. The study reported that no serious adverse events were seen during the trial; however 4 participants stopped their assigned medication due to adverse events (2 participants in bupropion group [1 in week 4 for insomnia, 1 in week 9 for dizziness]; 2 participants in placebo group [1 in week 2 for insomnia and palpitations, 1 in week 11 for insomnia, indigestion and weight loss]).

Fatemi 2005 (RCT, USA, –) assessed the effectiveness of bupropion (dose unknown) for smoking reduction in 10 outpatients with a diagnosis of schizophrenia or schizoaffective disorders. The study reported there were decreases in side effect symptoms in both the active and placebo phases of the trial as compared to baseline measurements.

George 2002 (RCT, USA, ++) assessed the effectiveness of bupropion (300mg) in 32 outpatients with schizophrenia or schizoaffective disorders. The study reported the experience of dry mouth was significantly more likely in the bupropion group compared to placebo (62.5% versus 25.0%, $p<0.05$); however, no significant difference were seen for headache, difficulty falling asleep, memory problems, blurred vision, irregular heartbeat, nausea, diarrhoea, anxiety/agitation, or tremor.

George 2008 (RCT, USA, ++) assessed the effectiveness of bupropion (300mg) (given in combination with NRT patches [21mg]) in 59 participants with schizophrenia or schizoaffective disorders. The study reported significant increases in side effects in the bupropion group as compared to placebo, relating to lack of concentration, jitteriness, light headedness, muscle stiffness, frequent nocturnal wakening. Additionally, 3 serious adverse events involving psychotic decompensation (2 placebo, 3 bupropion); however, these events were deemed to be unrelated to the study medication.

Li 2009 (RCT, China, –) assessed the effectiveness of bupropion (300mg) in 69 male in-patients diagnosed with schizophrenia. The paper reported significantly higher numbers of side effects in the bupropion group as compared to placebo ($p<0.05$), primarily relating to insomnia, dry mouth, restlessness, headache, nausea, diaphoresis (excessive sweating).

Tidey 2011 (RCT, USA, ++) assessed the effectiveness of bupropion (300mg) in addition to contingency payments in 57 outpatients diagnosed with schizophrenia or schizoaffective disorders. The study reported no significant differences between the bupropion and placebo groups for the following events all reported at least once by the participants; insomnia (41% versus 57%), restlessness (50% versus 46%), dry mouth (54% versus 38%), anxiety (36% versus 54%), headache (41% versus 38%), nausea (41% versus 31%), diarrhoea (23% versus 39%), chest pain (27% versus 19%), blurred vision (18% versus 15%), memory problems or confusion (19% versus 12%), racing heartbeat (9% versus 12%). Most events were mild to moderate in severity. Other events occurred <5%. No seizures of suicidal behaviours were noted.

Weiner 2011b (RCT, USA, ++) assessed the effectiveness of bupropion (300mg) in 46 outpatients diagnosed with schizophrenia or schizoaffective disorders. The study reported five participants in the bupropion group had adverse events relating to restlessness/anxiety (2 participants at week 1), mild exacerbations of psychosis (1 participant at baseline), rash (1 participants at week 2), and seizure due to hyponatraemia (low sodium concentration in serum of the blood) (1 participant at week 13). Two participants in the placebo group had adverse events relating to worsening of anxiety and restlessness (1 participant at week 4), and non-specific complaints of sedation and malaise (general uneasiness).

Post-traumatic stress disorder

Hertzberg 2001 (RCT, USA, +) assessed the effectiveness of bupropion (300mg) in 15 male combat veterans with a primary diagnosis of PTSD. The study reported adverse events in one participant randomised to bupropion relating to ataxia (lack of voluntary coordination of muscle movements), headaches, and jitteriness.

Bipolar disorder

Weiberger 2008 (RCT, USA, –) assessed the effectiveness of bupropion (300mg) in 5 outpatients with a diagnosis of bipolar. The study reported one of the participants (placebo) had increased distractibility and sexual inappropriateness; and another participant (placebo) had difficulty sleeping and increased energy. However, no side effects were reported in the participants on bupropion.

EVIDENCE STATEMENTS

ES20.1 There is strong evidence from 10 trials (**George 2002 [RCT, USA, ++]; Weiner 2011b [RCT, USA, ++] ; Bloch 2010 [RCT, Israel, –]** ; **Evins 2007 [RCT, USA, ++]; Evins 2005 [RCT, USA, ++]; Evins 2001 [RCT, USA, +] ; Li 2009 [RCT, China, –]**; **Tidey 2011 [RCT, USA, ++]; Fatemi 2005 [RCT, USA, -]; George 2008 [RCT, USA, ++]**) to suggest that bupropion was well tolerated in participants diagnosed with schizophrenia or schizoaffective disorders, with expected side effects of bupropion being seen (relating to dry mouth, nausea and headaches).

ES20.2 There is weak evidence from one trial (**Hertzberg 2001 [RCT, USA, +]**) to suggest bupropion was well tolerated in 15 male outpatients with PTSD.

ES20.3 There is very weak evidence from one trial (**Weinberger 2008 [RCT, USA, –]**) to suggest bupropion was well tolerated in 5 outpatients diagnosed with bipolar disorder.

Adverse events related to the use of bupropion are likely to be applicable to the UK setting, as there are no reasons to assume otherwise.

ADVERSE EVENTS RELATING TO NRT

Six studies, categorized by population, included in the review reported adverse events relating to NRT use.

MENTAL HEALTH DISORDER

Hartman 1991 (RCT, USA, ++) assessed the effectiveness of NRT patches in 3 in-patients and 11 outpatients receiving care from psychiatric services using a cross-over design. No differences in irritation at the patch site, taste or smell were noted in the participants.

Saxon 2003 (NRCT, USA, –) assessed the effectiveness of NRT patches (21mg) given in combination with bupropion (300mg) in 115 outpatients diagnosed with an axis I psychiatric disorder. Adverse events were not formally collected by the study; however, 3 participants reported adverse events when using NRT relating to i) dizziness, shortness of breath and chest pain, ii) light headedness, chest pain and nausea, iii) dizziness and disorientation.

SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDERS

George 2000 (quasi-RCT, USA, +) assessed the effectiveness of NRT (21mg) given in combination with high intensity behavioural therapy in 45 participants with schizophrenia or schizoaffective disorders. The study reported no significant differences in medication side effects of NRT between the treatment groups over the 6 weeks of use.

Dalack 1999 (NRCT, USA, +) assessed the effectiveness of NRT patches (22mg) in 10 in-patients diagnosed with schizophrenia or schizoaffective disorder using a cross-over design. The study reported one participant had nausea which was self-limiting whilst on the placebo condition. No side effects were noted during the NRT condition.

Williams 2007 (RCT, USA, +) assessed the effectiveness of high dose NRT patches (42mg) compared to standard patch (21mg) in 51 outpatients with a diagnosis of schizophrenia or schizoaffective disorders, for 8 weeks. The abstract reported high dose and standard dose NRT patches were tolerated well by the participants.

Tidey 2002 (NRCT, USA, –) assessed the effectiveness of contingency payments with NRT patches (21mg) for smoking reduction in 17 outpatients diagnosed with schizophrenia or schizoaffective disorders. The study reported itchiness or irritability at the patch site in 6 participants during the active NRT patch condition; however 5 of these participants also reported itchiness or irritability during the placebo patch condition. Problems sleeping or unusual dreams were reported in 4 participants during the contingency payment with NRT condition; and only one of these participants reported this event during the placebo condition too. One participant reported tiredness, cramping of the arm, and nausea. The study reported no evidence of nicotine toxicity even though the participants continued to smoke while wearing the patch.

EVIDENCE STATEMENT

ES21.1 There is moderate evidence from four trials (**George 2000 [quasi-RCT, USA, +]; Dalack 1999 [NRCT, USA, +]; Williams 2007 [RCT, USA, +]; Tidey 2002 [NRCT, USA, –]**) to suggest standard dose NRT patches (21 or 22mg/day) are well tolerated in participants with schizophrenia or schizoaffective disorders, with expected side effects being reported (irritability at patch site).

ES21.2 There is weak evidence from one trial (**Williams 2007 [RCT, USA, +]**) to suggest high dose NRT patches (42mg/day) are well tolerated in schizophrenia and schizoaffective disorder.

ES21.3 There is weak evidence from two trials (**Hartman 1991 [RCT, USA, ++]; Saxon 2003 [NRCT, USA, –]**) to suggest NRT patches (8mg/day are well tolerated in participants with mental health disorders.

Adverse events related to the use of NRT are applicable to the UK setting as there is no reason to assume that this would not be the case.

ADVERSE EVENTS RELATING TO VARENICLINE

Three of the four studies included in the review reported adverse events in the trial.

SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDER

Panchas 2012 (UBA, USA, -) assessed the effectiveness of varenicline with weekly cognitive behavioural therapy in 112 outpatients with schizophrenia or schizoaffective disorders. The study reported nausea was common; however, there 12 cases of serious adverse events leading to discontinuation of medication relating to nausea (5 participants), anxiety (1 participant), weight gain (1 participant), depressed mood (1 participant), paranoid (1 participant), suicide ideation (1 participant),and non-tobacco substance use (1 participant)

Smith 1999 (UBA, USA, –) assessed the effectiveness of varenicline in 14 male in-patients and outpatients diagnosed with schizophrenia or schizoaffective disorders. The study reported no adverse events; however, side effects were common, where two participants withdrew consent during the study due to side effects of varenicline. Throughout the study, 8 participants complained at least once of nausea, vomiting, shaking, dry mouth, tiredness-sleepiness, and cramps.

Weiner 2011a (RCT, USA, +) assessed the effectiveness of varenicline in 9 outpatients with schizophrenia or schizoaffective disorders. The study reported no adverse events; however, side effects were common. Side effects relating to constipation (2 participants), insomnia (3 participants), and nausea (3 participants) were reported in the varenicline group; and insomnia (1 participants), and nausea (1 participants) were reported in the placebo group.

EVIDENCE STATEMENT

ES22.1 There is weak evidence from three trials (**Panchas 2012 [UBA, USA, -]; Smith 1999 [UBA, USA, -]; Weiner 2011a [RCT, USA, +]**) to suggest varenicline did not lead to side effects in participants with schizophrenia or schizoaffective disorders; however, side effects were common, relating to nausea and insomnia.

Adverse events related to the use of varenicline are likely to be applicable to the UK setting as there is no reason to assume that this would not be the case.

ADVERSE EVENTS RELATING TO COMBINATION TREATMENT OF BUPROPION AND NRT

One of the trials included in the review reported on the adverse events relating to combination of bupropion and NRT.

MENTAL HEALTH DISORDER

Saxon 2003 [NRCT, USA, –] assessed the effectiveness of the combination of bupropion (300mg) and NRT patches (21mg) in 115 outpatients with an axis I psychiatric disorder. Adverse events were not formally collected by the study; however, no adverse events were reported for the combination treatment.

EVIDENCE STATEMENT

ES23.1 There is very weak evidence from one trial (**Saxon 2003 [NRCT, USA, -]**) to suggest combination treatments of bupropion and NRT patches are well tolerated in major mental health disorders (axis I psychiatric disorders).

Adverse events related to the use of the combination of bupropion with NRT are likely to be applicable to the UK setting as there is no reason why this would not be the case.

UNINTENDED CONSEQUENCES, INCLUDING MENTAL HEALTH RELATED OUTCOMES

Unintended consequences, including outcomes referring to participants' mental health condition, were reported in 28 studies which are categorised into behavioural and type of pharmacological medication, and summarised below.

HIGH INTENSITY BEHAVIOURAL THERAPY INTERVENTIONS

Five studies included in the review assessed the impact of unintended consequences of high intensity behavioural therapy interventions.

MENTAL HEALTH DISORDERS

Currie 2008 (quasi-RCT, Canada, +) assessed the effectiveness of eight sessions of a smoking cessation programme compared to using four sessions in 85 participants with severe and persistent mental illness. The study reported no significant differences between quitters and non-quitter from baseline to 12 month for a range of psychiatric symptoms scales (Brief Psychiatric Rating Scale thought differences, Brief Symptom Inventory, Global Assessment of Functioning). The Brief Psychiatric Rating Scale affective distress score decreased significantly over time ($p<0.05$), however this was independent of whether the participants quit or not.

Kisely 2003 (NRCT, Australia, -) assessed the effectiveness of a high intensity behavioural group therapy in 38 outpatients with a range of psychiatric disorders. The study reported no significant effect was seen of high intensity behavioural group therapy on psychiatric symptoms, as assessed using the General Health Questionnaire ($p=0.238$).

Morris 2011 (RCT, USA, +) assessed the effectiveness of a tobacco cessation group therapy programme in addition to a quit-line service in 123 outpatients with psychiatric diagnoses. For each treatment group from baseline to 6 months follow-up, significant reduction were seen for psychiatric symptoms scales (Hamilton Depression Scale, $p<0.01$; Brief Psychiatric Rating Scale, $p<0.01$); significantly lower levels were seen for nicotine dependence (FTND, $p<0.0001$); and significant improvements were seen for quality of life (Short Form health survey, $p<0.0001$). However, no significant differences were detected in the change scores between the treatment groups for the above scales (all $p>0.05$).

SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDERS

George 2000 (quasi-RCT, USA, +) assessed the effectiveness of a specialised schizophrenia group therapy programme compared to standard therapy programme in 45 participants with schizophrenia or schizoaffective disorders. No significant differences were seen in psychiatric symptoms; however, the psychological symptoms of nicotine abstinence (assessed using the psychological subscale of the

Shiffman-Jarvik Nicotine Withdrawal Scale) significantly increased in those who were abstinent compared to non-abstinent participants at week 4 ($p<0.01$).

Williams 2010 (RCT, USA, +) assessed the effectiveness of a high intensity behavioural counselling programme compared to a medium intensity programme in 100 outpatients with schizophrenia or schizoaffective disorders. No significant differences were seen for changes from baseline to week 12 post target quit date for positive symptoms (assessed using PANSS, $p=0.90$), negative symptoms (assessed using PANSS, $p=0.49$), or for depression (Becks Depression Inventory, $p=0.41$). Additionally, no significant differences in these scales were seen between those who had and had not achieved abstinence. The study reported no evidence of worsening of psychosis or mood symptoms in participants who took part in the trial.

POST-TRAUMATIC STRESS DISORDER

McFall 2005 (RCT, USA, +) assessed the effectiveness of integrated care in 66 outpatients under treatment for PTSD. The study reported no significant changes in mental health symptoms from baseline to 6 or 9 months follow-up in a sample as a whole (all $p>0.05$).

McFall 2010 (RCT, USA, ++) assessed the effectiveness of integrated care in 943 outpatients with PTSD. Over the 18 months trial, no significant difference was seen between the integrated care and usual standard care groups for psychiatric symptoms (PTSD Checklist and Patient Health Questionnaire); however, the PTSD severity was noted to improve in both of the treatment groups by approximately 10% (Clinician Administered PTSD Scale).

EVIDENCE STATEMENTS

ES24.1 There is moderate evidence from three trials in populations with mental health disorders (**Kisely 2003 [NRCT, Australia, -]; Currie 2008 [quasi-RCT, Canada, +]; Morris 2011 [RCT, USA, +]**) to suggest high intensity behavioural therapy programmes did not worsen mental health outcomes compared to standard behavioural therapy programmes on psychiatric symptoms.

ES24.2 There is moderate evidence from two trials focusing on populations with schizophrenia (**George 2000 [quasi-RCT, USA, +]; Williams 2010 [RCT, USA, +]**) to suggest high intensity behavioural therapy programmes did not worsen mental health outcomes compared to standard behavioural therapy programmes on psychiatric symptoms.

ES24.3 There is moderate evidence from two trials focusing on populations with PTSD (**McFall 2005 [RCT, USA, +]; McFall 2010 [RCT, USA, ++]**) to suggest high intensity behavioural therapy programmes did not worsen mental health outcomes compared to standard behavioural therapy programmes on psychiatric symptoms.

There is no reason to assume that unintended consequences related to the use of high intensity behavioural therapy programmes are not applicable to the UK setting.

BUPROPION

Nine of the trials included in the review assessed the impact of unintended consequences of bupropion.

SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDERS

Akbarpour 2010 (RCT, Iran, +) assessed the effectiveness of bupropion (300mg) in 32 male in-patients diagnosed with schizophrenia. Bupropion was significantly associated with enhancement of cognitive function at 12 weeks compared to placebo (p=0.014).

Evins 2001 (RCT, USA, +) assessed the effectiveness of bupropion (150mg) in 18 outpatients diagnosed with schizophrenia. Significant decreases in psychiatric symptoms were seen between the bupropion and placebo groups from baseline to week 12 (Brief Psychiatric Rating Scale, p=0.03) and from week 14-24 (p=0.02). Detailed analysis revealed the differences were primarily related to significant differences in the subscales assessing positive symptoms of psychosis (hallucinations, delusions, and formal thought disorder) and depressive symptoms; however, no significant differences were seen for negative symptoms (baseline to week 12, p=0.17; week 14-24, p=0.08). Depression scores were significantly different between the treatment groups from baseline to week 12 (Hamilton Rating Scale for Depression, p<0.01), but no significant difference was seen from week 14-24 (p=0.06). No differences were seen at the end of week 12 or week 24 for extrapyramidal symptoms (Simpson-Angus Scale) or akathisia (restless leg syndrome assessed using the Hillside Akathisia Scale). Significant reductions in weight were seen in favour of the bupropion group compared to placebo (p=0.02) from baseline to week 12; however no significant difference remained by the end of week 24.

Evins 2005 (RCT, USA, ++) assessed the effectiveness of bupropion (300mg) in 57 outpatients diagnosed with schizophrenia or schizoaffective disorder. A significant difference in the reduction from baseline to week 12 between the bupropion and placebo groups was seen for the cognitive subscale of the PANSS (p=0.029); however, no other significant reductions between the treatment groups were seen for other psychopathology outcomes or their subscales (Scale for Assessment of Negative Symptoms, Hamilton Depression Rating Scale, Hamilton Anxiety Scale, total score for PANSS or its other subscales). No significant reductions were seen in the bupropion group from baseline to week 12 for the psychopathology outcomes or their subscales. No significant differences were seen from baseline to week 12 for within or between treatment group differences (Wisconsin Smoking Withdrawal Scale).

Evins 2007 (RCT, USA, ++) assessed the effectiveness of bupropion (300mg) in 51 outpatients diagnosed with schizophrenia. The study reported no significant differences in psychopathological outcomes relating to negative symptoms (Scale for Assessment of Negative Symptoms), positive or negative symptoms (PANSS), anxiety (State Trait Anxiety Scale), or abnormal involuntary movements (Abnormal Involuntary Movements Scale).

Fatemi 2005 (RCT, USA, –) assessed the effectiveness of bupropion (dose not stated) for smoking reduction in 10 outpatients with schizophrenia or schizoaffective disorders. The study reported there were non-significant decreases in both positive and negative symptoms during the active and placebo phases of the trial as compared to baseline measurements (assessed using the PANSS).

George 2002 (RCT, USA, ++) assessed the effectiveness of bupropion (300mg) in 32 outpatients with schizophrenia or schizoaffective disorders. No significant differences were seen between the groups on positive symptoms of schizophrenia (PANSS); however, there was a reduction in the negative symptoms ($p<0.05$). No significant effects were seen though for craving (Tiffany Questionnaire for Smoking Urges), depression (BDI; $p=0.27$), dyskinetic (Abnormal Involuntary Movement Scale), or extrapyramidal symptoms (Webster Extrapyramidal Scale).

Hertzberg 2001 (RCT, USA, +) assessed the effectiveness of bupropion (300mg) in 15 male combat veteran outpatients with PTSD. No significant changes were seen from baseline to 12 weeks in the bupropion treatment group for a range of self-reported symptoms scales: Davidson Trauma Scale, Pittsburgh Sleep Quality Index, Hamilton Rating Scale for Depression, Clinician Global Impressions Scale, and Hughes Withdrawal Symptoms Checklist. However, a significant difference was seen for the Questionnaire on Smoking Urges scale suggesting bupropion had decreased the urge to smoke ($p<0.0001$).

Weiner 2011b (RCT, USA, ++) assessed the effectiveness of bupropion (300mg) in 46 outpatients diagnosed with schizophrenia or schizoaffective disorders. No significant differences were seen between the bupropion and placebo groups for positive symptoms items of the Brief Psychiatric Rating Scale ($p=0.29$), anxiety/depression items of the Brief Psychiatric Rating Scale ($p=0.64$), or negative symptoms (Scale for the Assessment of Negative Symptoms, $p=0.30$). Additionally, no significant effect was seen on the effect of bupropion on impairment of cognitive function compared with placebo at week 14 (battery of neuropsychological tests were used; $p=0.34$).

BIPOLAR DISORDER

Weinberger 2008 (RCT, USA, –) assessed the effectiveness of bupropion (300mg) in 5 outpatients with a bipolar disorder. No significant mood changes were noted in the participants receiving bupropion (Young Mania Rating Scale, BDI and Hamilton Depression Rating Scale).

EVIDENCE STATEMENTS

ES25.1 There is moderate evidence from eight trials (**Hertzberg 2001 [RCT, USA, +]; George 2002 [RCT, USA, ++]; Arkbapour 2010 [RCT, Iran, +]; Weiner 2011b [RCT, USA, ++]; Evins 2007 [RCT, USA, ++]; Evins 2005 [RCT, USA, ++]; Evins 2001 [RCT, USA, +]; Fatemi 2005 [RCT, USA, -]**) to suggest bupropion (predominately given at 300mg/day) did not worsen mental health outcomes in participants with schizophrenia or schizoaffective disorders.

ES25.2 There is moderate evidence from one trial (**George 2002 [RCT, USA, ++]**) to suggest that whilst bupropion (300mg/day) resulted in no significant difference in positive symptoms of schizophrenia, there was a significant reduction in negative symptoms of schizophrenia.

ES25.3 There is weak evidence from one trial (**Evins 2001 [RCT, USA, +]**) to suggest bupropion (150mg/day) significantly reduces weight in the short term in 18 outpatients diagnosed with schizophrenia.

ES25.4 There is very weak evidence from one trial (**Weinberger 2008 [RCT, USA, -]**) to suggest bupropion (300mg/day) has no detrimental effect on mood changes in 5 outpatients with bipolar disorder.

Unintended consequences related to the use of bupropion are likely to be applicable to the UK setting, as there are no reasons to assume otherwise.

CLOZAPINE

Two trials assessed the impact of unintended consequences of clozapine.

SCHIZOPHRENIA OR SCHIZOAFFECTIVE DISORDERS

McEvoy 1995 (RCT, USA, –) assessed the effectiveness of different plasma levels of clozapine in 12 chronically hospitalised in-patients with schizophrenia. The medium (200-300ng/ml) and higher (250-450ng/ml) range groups were associated with significantly greater improvements in psychiatric symptoms compared to the lower range group (50-150ng/ml) (Brief Psychiatric Scale, p=0.02; Clinical Global Impressions severity items, p=0.005).

McEvoy 1999 (RCT, USA, +) assessed the effectiveness of different plasma levels of clozapine in 55 smoking and 15 non-smoking in-patients with schizophrenia. Psychiatric symptoms in the 70 participants were significantly more likely to be reduced in the higher dose group (200-450ng/ml, combination of medium and high plasma level groups) than compared to the low plasma level group (50-150ng/ml) (Brief Psychiatric Rating Scale, p=0.003).

EVIDENCE STATEMENT

ES26.1 There is weak evidence from two trials (**McEvoy 1995 [RCT, USA, -]; McEvoy 1999 [RCT, USA, +]**) to support the assumption that moderate to high plasma levels (200-450ng/ml) of clozapine are significantly more likely to reduce psychiatric symptoms and severity of symptoms in schizophrenia than lower plasma levels (50-150ng/ml).

Unintended consequences as a result of using clozapine are likely to be applicable to the UK setting, as there is no reason to assume that this would not be the case.

NICOTINE REPLACEMENT THERAPY

Two studies included in the review assessed the impact of unintended consequences of NRT.

SCHIZOPHRENIA OR SCHIZOAFFECTIVE DISORDERS

Dalack 1999 (NRCT, USA, –) assessed the effectiveness of NRT patch (22mg) in 10 in-patients diagnosed with schizophrenia or schizoaffective disorders. No significant differences in psychiatric symptoms or antipsychotic-induced Parkinsonism were noted between the two treatment conditions (Brief Psychiatric Rating Scale, Scale for Assessment of Negative Symptoms, Hamilton Depression Scale, Simpson-Angus Scale); however, abnormal involuntary movements increased with the NRT patch plus smoking, where 6 of the 10 participants had an increase (Abnormal Involuntary Movements Scale, $p<0.05$) .

DEPRESSIVE DISORDERS

Hill 2007 (NRCT, USA, –) assessed the effectiveness of NRT patch (14mg) in 9 participants with major depressive disorders. No significant differences were seen between the treatment groups for depression (BDI; p=0.47) or for withdrawal (Minnesota Nicotine Withdrawal Scale, MNWS; p=0.23).

EVIDENCE STATEMENT

ES27.1 There is very weak evidence from one trial (**Dalack 1999 [NRCT, USA, –]**) to suggest NRT patches (22mg/day) had no detrimental effect on psychiatric symptoms in 10 in-patients with schizophrenia.

ES27.2 There is very weak evidence from one trial (**Dalack 1999 [NRCT, USA, -]**) to suggest NRT patches (22mg/day) increased abnormal involuntary movements in those who used the patch whilst still smoking in 10 in-patients with schizophrenia.

ES27.3 There is very weak evidence from one trial (**Hill 2007 [NRCT, USA, -]**) to suggest NRT patches (14mg/day) had no detrimental effect on psychiatric symptoms in 9 participants with major depression.

Unintended consequences related to the use of NRT are applicable to the UK setting as there is no reason to assume that this would not be the case.

VARENICLINE

All four of the trials included in the review assessed the impact on intended consequences of varenicline.

SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDERS

Dutra 2012 (UBA, USA, -) assessed the effectiveness of varenicline (2mg) in 102 outpatients diagnosed with schizophrenia or schizoaffective disorders. No significant change from baseline to 12 weeks was seen in the total scores or subscales of the Scale for the Assessment of Negative Symptoms (SANS, p>0.05).

Panchas 2012 (UBA, USA, -) assessed the effectiveness of varenicline (2mg) in 112 outpatients diagnosed with schizophrenia or schizoaffective disorders. Significant improvements from baseline to week 12 or early termination was seen for psychosis (measured using the Brief Psychiatric Rating Scale, BPRS).

Smith 1999 (UBA, USA, –) assessed the effectiveness of varenicline (2mg) in 14 male in-patients and outpatients diagnosed with schizophrenia or schizoaffective disorders. No significant increases were seen for positive symptoms (PANSS positive symptoms, p=0.08), negative symptoms (PANSS negative symptoms, p=0.64), or depression (PANSS depression, p=0.70), or for the overall PANSS score (p=0.69). Suicide ideation or clinically significant depression remained absent during the trial. No significant effect was seen on cognitive function when assessed using the total score for the Repeatable Battery for Assessment of Neuropsychological Status (p=0.67); however significant increases were seen for some components of the battery relating to list learning (p=0.005), language index (p=0.003), and list recall (p=0.03); and significant decreases in visual spatial construction (p=0.03).

Weiner 2011a (RCT, USA, +) assessed the effectiveness of varenicline (2mg) in 9 outpatients with schizophrenia or schizoaffective disorders. No significant difference was seen on positive psychiatric symptoms (Brief Psychiatric Rating Scale, p=0.29) or anxiety/depression scores (Brief Psychiatric Rating Scale, p=0.99) between the varenicline and placebo groups. Suicide ideation remained absent during the trial, and the study reported no significant exacerbations of psychotic, depressive or other psychiatric symptoms in any participants.

EVIDENCE STATEMENTS

ES28.1 There is weak evidence from four trials (**Dutra 2012 [UBA, USA, -]; Panchas 2012 [UBA, USA, -]; Smith 1999 [UBA, USA, -]; Weiner 2011a [RCT, USA, +]**) to suggest varenicline (2mg/day) had no significant detrimental effect on psychiatric symptoms, cognitive function, or suicide ideation in predominately outpatients with schizophrenia.

Unintended consequences from using varenicline are likely to be applicable to the UK setting as there is no reason to assume that this would not be the case.

COMBINATION OF NICOTINE REPLACEMENT THERAPY AND BUPROPION

One trial included in the review assessed the impact of unintended consequence of the combination treatment of NRT and bupropion.

SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDERS

George 2008 (RCT, USA, ++) assessed the effectiveness of the combination of bupropion (300mg) and NRT patches (21mg) in 59 outpatients with schizophrenia or schizoaffective disorders. No significant differences were noted relating to positive or negative symptoms of schizophrenia assessed using the PANSS, or depression as assessed using the BDI.

EVIDENCE STATEMENT

ES29.1 There is moderate evidence from trial (**George 2008 [RCT, USA, ++]**) to suggest the combination of bupropion (300mg/day) and NRT patches (21mg/day) had no significant effect on psychiatric symptoms in 59 outpatients with schizophrenia.

Unintended consequences from using the combination of bupropion and NRT are likely to be applicable to the UK setting as there is no reason why this would not be the case.

COMBINATION OF HIGH INTENSITY BEHAVIOURAL THERAPY WITH BUPROPION

One study included in the review assessed the impact of unintended consequences of the combination of high intensity behavioural therapy with bupropion.

SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDERS

Weiner 2001 (UBA, USA, –) assessed the effectiveness of high intensity behavioural therapy with bupropion (300mg) for smoking reduction in 9 outpatients with schizophrenia or schizoaffective disorders. The study found no significant changes from baseline to week 14 in positive symptoms of scores (mean, 10.6 versus 10.6), anxiety scores (mean, 2.6 versus 1.9), or depression scores (mean, 1.6 versus 1.8) (assessed using the Brief Psychiatric Rating Scale); negative symptom scores (Scale for the Assessment of Negative Symptoms, mean, 29.4 versus 24.1; p=0.12); or changes on any cognitive measure (p>0.05). However, the study did demonstrate a significant reduction in alogia (inability to speak) factor scores from baseline to week 14 (Scale for the Assessment of Negative Symptoms, mean, 3.0 versus 1.1; p<0.05).

EVIDENCE STATEMENT

ES30.1 There is very weak evidence (**Weiner 2001 [UBA, USA, -]**) to suggest the combination of high intensity behavioural therapy with bupropion (300mg/day) for smoking reduction has no detrimental effect depression, anxiety, or psychiatric symptoms in 9 outpatients with schizophrenia; however, some evidence of an improvement was seen for alogia.

Unintended consequences from using the combination of high intensity behavioural therapy with bupropion are likely to be applicable to the UK setting as there is no reason why this would not be the case.

HIGH INTENSITY BEHAVIOURAL THERAPY AND NICOTINE REPLACEMENT THERAPY

Three trials included in the review assessed the impact of unintended consequences of high intensity behavioural therapy in addition to nicotine replacement therapy.

MENTAL HEALTH DISORDERS

Baker 2009 (NRCT, Australia, –) assessed the effectiveness of CBT and MI with NRT (42mg) patches in 48 outpatients with a non-acute psychotic disorder. No significant changes were seen from baseline to post-treatment assessment for quality of life (Short Form survey, mental components: p=0.13; physical health components: p=0.89), depression (BDI, p=0.96), or psychotic symptoms (Brief Psychiatric Rating Scale, p=0.51).

SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDERS

Baker 2006 (RCT, Australia, +) assessed the effectiveness of a CBT and MI with NRT patches (21mg) in 298 in-patients and outpatients with a diagnosis of schizophrenia or schizoaffective disorders. No significant differences were seen between the treatment groups for overall psychopathology (Brief Psychiatric Scale), quality of life (physical components of Short Form survey), anxiety (State-Trait Anxiety Inventory), or depression (BDI). However within the groups, significant reductions were seen for anxiety from baseline to 6 months ($p<0.001$), depression from baseline to all three outcome timings (3 months, $p<0.001$; 6 months, $p<0.001$; 12 months, $p<0.001$), and the mental components of the quality of life scale (Short Form survey) from baseline to all three outcome timings (3 months, $p<0.001$; 6 months, $p<0.01$; 12 months, $p<0.01$).

MAJOR DEPRESSION

Barnett 2008 (RCT, USA, +) assessed the effectiveness of a high intensity behavioural programme with NRT (dose not given) in 322 outpatients with uni-polar depression. No significant difference in depression was seen between the stepped care and brief contact groups (assessed using the BDI).

EVIDENCE STATEMENT

ES31.1 There is very weak evidence from one trial (**Baker 2009 [NRCT, Australia, –]**) to suggest the combination of high intensity behavioural therapy with NRT patches (42mg/day) had no significant effect on psychiatric symptoms or quality of life in 48 outpatients with a non-acute psychotic disorder.

ES31.2 There is weak evidence from one trial (**Baker 2006 [RCT, Australia, +]**) to suggest the combination of high intensity behavioural therapy with NRT (21mg/day) had no significant effect on psychiatric symptoms, quality of life, depression, or anxiety in 298 in-patients an outpatients with schizophrenia.

ES31.3 There is weak evidence from one trial (**Barnett 2008 [RCT, USA, +]**) to suggest the combination of high intensity behavioural therapy with NRT (dose not stated) had no significant effect on depressive symptoms in 322 outpatients with major depression.

Unintended consequences as a result of using the combination of high intensity behavioural therapy with NRT are applicable to the UK setting as there is no reason why this would not be the case.

COMBINATION TREATMENT OF CONTINGENCY PAYMENTS AND BUPROPION

One trial included in the review assessed the impact of unintended consequences of the combination of contingency payments and bupropion.

SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDERS

Tidey 2011 (RCT, USA, ++) assessed the effectiveness of contingency payment with bupropion (300mg) in 57 outpatients with a diagnosis of schizophrenia or schizoaffective disorders. No significant differences were detected between the treatment groups for psychopathology related outcomes (PANSS, Motor Examination section of the Unified Parkinson's Disease Rating Scale, Abnormal Involuntary Movements Scale, all $p<0.05$); however, across the treatment groups all of these outcomes significantly reduced from baseline (week 1) (Questionnaire on Smoking Urges, $p<0.001$; PANSS, $p<0.001$; Motor Examination section of the Unified Parkinson's Disease Rating Scale, $p<0.001$; Abnormal Involuntary Movement Scale, $p<0.001$).

EVIDENCE STATEMENT

ES32.1 There is moderate evidence from one trial (**Tidey 2011 [RCT, USA, ++]**) to suggest contingency payments given in addition to bupropion (300mg/day) does not have a detrimental effect on psychiatric symptoms in 57 outpatients with schizophrenia.

Unintended consequences as a result of using the combination of contingency payments with bupropion are likely to be applicable to the UK setting as there is no reason why this would not be the case.

COMBINATION OF CONTINGENCY PAYMENTS AND NICOTINE REPLACEMENT THERAPY

One trial included in the review assessed the impact of unintended consequences of the combination treatment of contingency payments with NRT.

SCHIZOPHRENIA OR SCHIZOAFFECTIVE DISORDERS

Gallagher 2007 (RCT, USA, –) assessed the effectiveness of contingency payments with NRT (21mg) in 180 outpatients diagnosed with schizophrenia or schizoaffective disorders. No significant changes from baseline to week 20 or week 36 were seen in self-reported psychiatric symptoms (Brief Symptoms Inventory).

EVIDENCE STATEMENT

ES33.1 There is very weak evidence from one trial of 180 outpatients with schizophrenia or schizoaffective disorders (**Gallagher 2007 [RCT, USA, -]**) to suggest contingency payments given in addition to NRT (21mg/day) does not have detrimental effects on psychiatric symptoms in the short term and medium term.

Unintended consequences as a result of using the combination of contingency payments with NRT are likely to be applicable to the UK setting as there is no reason why this would not be the case.

QUESTION 2. HOW EFFECTIVE ARE CURRENT STRATEGIES/APPROACHES USED BY SECONDARY CARE MENTAL HEALTH SERVICES FOR IDENTIFYING AND REFERRING PEOPLE FROM THE POPULATION OF INTEREST TO STOP SMOKING OR HOSPITAL BASED STOP SMOKING SERVICES?

No studies were identified which assessed the effectiveness of current strategies or approaches used by secondary care mental health services for identifying and referring people from the population of interest to stop smoking or hospital based stop smoking services. However, information relating to the barriers and facilitators of current strategies and approaches used are presented in Review 5.

EVIDENCE STATEMENT

ES34.1 No studies were identified which assessed the effectiveness of current strategies or approaches used by secondary care mental health services for identifying and referring people from the population of interest to stop smoking or hospital based stop smoking services.

QUESTION 3. HOW EFFECTIVE ARE CURRENT STRATEGIES/APPROACHES USED BY SECONDARY CARE MENTAL HEALTH SERVICES FOR IDENTIFYING AND PROVIDING PEOPLE FROM THE POPULATION OF INTEREST WITH SMOKING CESSATION INFORMATION, ADVICE AND SUPPORT?

No studies were identified which assessed the effectiveness of current strategies or approaches used by secondary care mental health populations for identifying and providing people from the population of interest with smoking cessation information, advice and support. However, information relating to the barriers and facilitators of current strategies and approaches used are presented in Review 5.

EVIDENCE STATEMENT

ES35.1 No studies were identified which assessed the effectiveness of current strategies or approaches used by secondary care mental health populations for identifying and providing people from the population of interest with smoking cessation information, advice and support.

QUESTION 4. WHICH STRATEGIES/APPROACHES ARE EFFECTIVE IN ENCOURAGING MENTAL HEALTH CARE PROFESSIONALS TO RECORD SMOKING STATUS AND REFER POPULATIONS OF INTEREST TO STOP SMOKING SERVICES?

No studies were identified which assessed the effectiveness of strategies for encouraging mental health professional to record smoking status, or refer populations of interest to stop smoking services. However, one primary study was identified which assessed the effectiveness of an intervention for encouraging the participants with mental health illness to refer to a stop smoking service. The study was summarised in detail in the evidence table in Appendix 7. The findings from this study are presented below. The internal validity quality score for the study is presented in parentheses following the citation.

BEHAVIOURAL INTERVENTIONS

HIGH INTENSITY BEHAVIOURAL THERAPY INTERVENTIONS

Steinberg 2004 (RCT, USA, ++) A RCT was performed to assess the effectiveness of high intensity behavioural therapy programme for motivating 78 outpatient smokers with schizophrenia or schizoaffective disorders for referral to stop smoking service. Participants were randomised to one of three groups, and each received only one therapy session. The first treatment group used a high

intensity behavioural programme based on motivation interviewing (duration 40 minutes) and included personalized feedback. The second treatment group used psycho-educational intervention where participants discussed the general benefits of quitting and harmful effects of smoking (duration 40 minutes). The third treatment group used a brief intervention (duration 5 minutes). At the end of the sessions, all participants were given advice concerning quitting smoking and were referred to a specialised stop smoking service.

Referring to stop smoking services

The study demonstrated a higher proportion of participants sought treatment at the stop smoking service in the motivational interviewing group (25.8%) compared to the psycho-educational (0%) and brief intervention (0%) groups at one week post-therapy session. Similar effects were reported at one month post therapy session (MI, 32.3% versus psycho-educational, 11.8% versus brief intervention, 0%).

EVIDENCE STATEMENTS

ES36.1 No studies were identified which assessed the effectiveness of current strategies or approaches used by secondary care mental health populations for recording smoking status in the population of interest.

ES36.2 No studies were identified which assessed the effectiveness of current strategies or approaches used by secondary care mental health populations for referring populations of interest to stop smoking services.

ES36.3 There is moderate evidence from one trial of 78 outpatients with schizophrenia (**Steinberg 2004 [RCT, USA, ++]**) to suggest that a single session of motivational interviewing resulted in a higher proportion of participants seeking referral for a stop smoking service compared to psycho-educational or brief intervention.

The evidence from the individual study of high intensity behavioural therapy as an intervention to increase referral to a stop smoking service is directly applicable to the UK as the study was based on an outpatient population with mental health disorders, and the intervention is feasible in the UK setting as it is currently used for smoking cessation in the general population. The study was conducted in the USA.

Table 16 Summary evidence table for high intensity behavioural therapy for referral to stop smoking service

Study details	Location and setting	Description of population	Outline of study	Internal validity score
Steinberg 2004 RCT, n=78	**Location:** USA **Setting:** Outpatient	At least 10 cigarette per day, diagnosis of schizophrenia or schizoaffective disorder **Motivation:** Didn't require participants to quit smoking	**Intervention:** Motivational interviewing group – personalised feedback based on assessment interview, duration approximately 40 minutes and concluded with advice to quit smoking and with a referral for treatment to a specialised tobacco dependence treatment programme **Control:** Psycho-educational intervention – engaged in brief psycho-educational discussion on general benefits of quitting and the deleterious health effects of smoking based on standard protocol, predominately didactic but encouraged discussion (40 minute intervention). Concluded intervention with advice to quit and referral for treatment **Outcome:** Referral to stop smoking service	++ **Limitations:** Self-selected participants, lead researcher delivered interventions, participants charts relied on for diagnoses, unknown quit rate, minimal intervention had much less contact so comparisons with this could be related to contact rather than content, but the other treatment groups were comparable

DISCUSSION

This review of smoking cessation in secondary mental health services comprises of a large body of evidence. Fifty-nine studies were identified, of which 10 were based on systematic or critical review methodology and the remaining 49 were primary evidence. The majority of the studies assessed the effectiveness of interventions in schizophrenia, with only a few studies assessing outcomes in different mental health populations. Most interventions assessed included behavioural therapies, bupropion, NRT, varenicline. The majority of studies were conducted in the United States, with few studies from other countries, and no studies were identified from the UK. The methodological quality of the studies was very variable, with few studies being awarded the highest quality for both internal and external validity. The majority of studies presented smoking abstinence using bio-verification of either expired CO or cotinine levels.

Overall, the evidence from the review suggested:

BEHAVIOURAL THERAPY (WITH NO PHARMACOTHERAPY)

Very few well conducted high quality studies have been performed to assess the effectiveness of high intensity behavioural therapy for smoking cessation or reduction. However, the evidence to date suggests high intensity behavioural therapy may be effective in populations with specific mental health disorders.

- The effectiveness of high intensity behavioural therapy in people with psychiatric disorders is mixed and mostly based on weak evidence, where an effect was seen in the short term in adults for cessation and smoking reduction, but no effect on cessation was seen in the long term in adolescents. However, there was moderate evidence that integrated tailored behavioural therapy was more effective for smoking cessation in PTSD in the short and long term, than usual standard of care (referral to a specialised smoking cessation clinic)
- There was moderate evidence to suggest high intensity behavioural therapy did not appear to be more effective for smoking cessation than lower intensity behavioural therapy in the short term in schizophrenia on cessation; however, it should be noted that in one of the studies the intensity of the behavioural therapy in the control group was relatively high
- There was moderate evidence to suggest low intensity behavioural therapy was not effective for smoking cessation or reduction in schizophrenia; however, there was very weak evidence to suggest it may be effective for smoking reduction in other psychiatric populations
- There was moderate evidence to suggest motivational interviewing may be effective in increasing the number of people with mental health disorders to seek referral for a stop smoking service compared to psycho-educational or brief intervention.

BUPROPION

Several well conducted high quality studies have been performed to assess the effectiveness of bupropion for smoking cessation or reduction. The evidence to date suggests bupropion is effective for smoking cessation in the short term in populations with schizophrenia.

- There was strong evidence that bupropion was effective for increasing smoking cessation in the short term in schizophrenia, but the effect in the medium and long term is unclear
- There was moderate evidence to suggest bupropion was effective for smoking reduction in the short term in schizophrenia
- There was very weak evidence to suggest bupropion did not appear to be effective for smoking cessation in PTSD or bipolar

NICOTINE REPLACEMENT THERAPY (NRT)

Very few well conducted high quality studies have been performed to assess the effectiveness of NRT for smoking cessation or reduction. The evidence to date is mixed regarding whether NRT is effective in populations with mental health disorders.

- There was weak evidence to suggest high dose NRT may be more effective than standard dose NRT for cessation in schizophrenia
- There was mixed very weak evidence to suggest NRT regarding the effectiveness of NRT for smoking reduction or cessation in major depression or schizophrenia in the short term

VARENICLINE

No well conducted high quality studies have been performed to assess the effectiveness of varenicline for smoking cessation or reduction. The evidence to date suggests varenicline may have some effectiveness for reducing smoking.

- There was weak evidence to suggest varenicline may reduce smoking consumption, but was not effective for abstinence, in schizophrenia

OTHER PHARMACOTHERAPIES

Very few well conducted moderate to high quality studies have been performed to assess the effectiveness of other pharmacotherapies for smoking cessation or reduction. The evidence to date suggests clozapine (an atypical [new generation] antipsychotic medication) may be effective for reducing smoking.

- There was moderate evidence to suggest higher doses of clozapine (350-600mg/day) may be effective for smoking reduction, but no effect was seen for smoking cessation, in schizophrenia.
- There was very weak evidence to suggest fluoxetine did not appear to be effective for smoking reduction in major depression
- There was very weak evidence to suggest galantamine did not appear to be effective for smoking reduction in schizophrenia
- There was moderate evidence to suggest naltrexone was not effective for smoking cessation or reduction in consumption in schizophrenia

COMBINATIONS OF INTERVENTIONS

Very few well conducted high quality studies have been performed to assess the effectiveness of combinations of interventions as compared to control. The evidence to date suggests the combination of bupropion with NRT may be effective for smoking cessation.

- There was very weak evidence to suggest the combination of bupropion with NRT may be effective in reducing smoking consumption in psychiatric populations
- There was moderate evidence to suggest the combination of bupropion with NRT was effective for smoking cessation in the short term, but not in the long term, in schizophrenia
- There was very weak evidence to suggest the combination of high intensity behavioural therapy with bupropion may reduce smoking consumption in schizophrenia
- There was weak evidence to suggest the combination of high intensity behavioural therapy with NRT may be effective for reducing smoking consumption, but had no effect on cessation, in non-acute psychotic disorders or depression

CONTINGENCY PAYMENTS (WITH OR WITHOUT PHARMACOTHERAPIES)

Very few well conducted high quality studies have been performed to assess the effectiveness of contingency payment with or without pharmacotherapies for smoking cessation or reduction. The evidence to date suggests the combination of contingency payments with bupropion was effect for reducing smoking in specific mental health populations.

- There was weak evidence to suggest contingency payments may be effective for reducing smoking consumption in schizophrenia
- There was moderate evidence to suggest contingency payments with bupropion was effective on reducing smoking in schizophrenia
- There was very weak evidence to suggest contingency payments with NRT patches may be effective for a reduction in smoking consumption and smoking abstinence in schizophrenia

EFFECTIVENESS OF INTERVENTION BY TYPE OF ANTI-PSYCHOTIC MEDICATION

There were several well conducted high quality studies that have been performed to assess the difference in effectiveness of interventions for smoking cessation by the type of anti-psychotic medication used. The evidence to date is mixed regarding whether the effectiveness differs between using typical and atypical antipsychotic medication.

- There was mixed moderate evidence regarding the difference in effectiveness of high intensity behavioural therapy or bupropion for smoking cessation by the type of anti-psychotic medication used in schizophrenia.

No studies were identified which assessed:

- The effectiveness of interventions for temporary abstinence in people with mental health illness.
- The effectiveness of current strategies or approaches used by secondary care mental health services for identifying and referring people from the population of interest to stop smoking or hospital based stop smoking services.
- The effectiveness of current strategies or approaches used by secondary care mental health populations for identifying and providing people from the population of interest with smoking cessation information, advice and support.

- The effectiveness of current strategies or approaches used by secondary care mental health populations for referring populations of interest to stop smoking services.

This review was conducted to a high methodological quality by performing a comprehensive and systematic search strategy which was based on searching multiple electronic databases, websites, and reference screening. Additionally, double screening of titles, abstracts and full texts were performed independently, and high agreements rates were seen for screening, data extraction and quality assessments. However, the review is not without limitations. The majority of the studies included in the review were conducted in the USA, with no studies being identified from the UK; therefore, the applicability of the evidence and generalisability from these other settings to the UK needs to be considered. However, while idiosyncrasies in the structure of mental health service provision in different countries need to be acknowledged, there is no reason to believe that interventions which are effective in one country would not be in another, assuming similar patient characteristics Since none of the studies included in this review was conducted in high secure (forensic) service settings, the findings from this review are only generalisable to inpatient settings of low to medium (and often mixed open/secure) security; however, it would be of interest in the future for studies to assess the effectiveness of interventions, in particular relating to temporary abstinence, in high security inpatient settings. Most of the studies included in this review included patients whose conditions was assessed as stable. Therefore, it is unclear whether the interventions would be of similar effectiveness for patients in the acute phase of illness. In the future, studies should consider assessing the effectiveness of smoking cessation and temporary abstinence interventions in this group of patients (for example on assessment wards and intensive care units); however, this patient group would be very challenging to study due to complex practical and ethical implications of conducting research in a group of acutely ill patients. Additionally when conducting future studies, researchers need to consider the attitudes of staff and the historic culture of smoking in mental health settings, since these can often undermine change in these settings (please refer to Review 5: Barriers and Facilitators for smoking cessation interventions in mental health). The review is also subject to methodological limitations primarily relating to tight time constraints, where authors of the original studies could not be contacted to provide further information where necessary. Additionally, few meta-analyses could be performed due to the differences in interventions, study design, mental health populations, and outcome measures; therefore the evidence from this review is based predominately on a narrative summary, with the studies providing evidence that was inconclusive regarding the effectiveness of several interventions. However, this review highlights the urgent need for further high quality research to be performed in the areas of smoking cessation and reduction, and temporary abstinence in secondary care mental health service settings in the majority of the identified areas, and particularly in the UK.

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SMOKING CESSATION IN MENTAL HEALTH SERVICES

Review 4: Effectiveness of Smoking Cessation Interventions in Mental Health

APPENDICES

PRODUCED BY: UK Centre for Tobacco Control Studies (http://www.ukctcs.org/)

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DATE: 30 November 2012

VERSION: Draft 5.0

November 2021: NICE guidelines PH45 (June 2013) and PH48 (November 2013) have been updated and replaced by NG209.
The recommendations labelled [2013] or [2013, amended 2021] in the updated guideline were based on these evidence reviews.
See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

CONTENTS PAGE

APPENDIX 1A. SEARCH STRATEGY

AMED (ALLIED AND COMPLEMENTARY MEDICINE)

Database host: OVID
Database coverage dates: 1985-current
Search date: 3/2/2012
Number of records: 53
Date limits: 1985-2012

1 SMOKING CESSATION/ 135
3 SMOKING/ 245
4 1 OR 3 364
5 NEUROTIC DISORDERS/ OR PSYCHOTIC DISORDERS/ OR SCHIZOPHRENIA/ OR DELIRIUM/ OR AMNESIA/ OR ADJUSTMENT DISORDERS/ OR MENTAL DISORDERS/ OR exp PERSONALITY DISORDERS/ OR exp SOMATOFORM DISORDERS/ OR exp EATING DISORDERS/ OR exp DISSOCIATIVE DISORDERS/ OR exp DEMENTIA/ OR exp COGNITION DISORDERS/ OR exp CHILD MENTAL DISORDERS/ OR exp ANXIETY DISORDERS/ OR exp AFFECTIVE DISORDERS/ 16325
6 RETT SYNDROME/ 37
7 REHABILITATION CENTERS/ 258
8 MENTAL HEALTH/ 996
9 MENTAL HEALTH SERVICES/ OR COMMUNITY MENTAL HEALTH SERVICES/ 1152
10 ALZHEIMERS DISEASE/ 705
12 COGNITION DISORDERS/ 1495
13 ATTENTION DEFICIT DISORDER WITH HYPERACTIVITY/ 515
14 CHILD BEHAVIOR DISORDERS/ 362
15 MOTOR SKILLS DISORDERS/ 108
16 DYSLEXIA/ 230
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29 27 AND 28 3
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31 ("give up" OR "gives up" OR "giving up").ti,ab 750
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35 34 [Limit to: Publication Year 1985-Current] 53

ASSIA (Applied Social Science Index and Abstracts)

Database host: CSA Illumina
Database coverage dates: 1987-current
Search date: 31/1/2012
Number of records: 458
Date limits: 1985-2012

Search query: (((DE=("tobacco" or "cigarettes" or "cigars" or "snuff" or "ex smokers" or "heavy smoking" or "light smokers" or "moderate smoking" or "occasional smoking" or "smokers" or "smoking" or "tobacco smoke")) and(DE="cessation")) or((TI=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars) OR AB=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)) and(TI=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) OR AB=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*))) or(TI=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti) OR AB=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti)) or(TI=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*) OR AB=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*)) or(TI=("controlled smoking") OR AB=("controlled smoking")) or(TI=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*))) or(AB=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*)))) and((((DE=("psychiatric disorders" or "mental health" or "psychiatric nurses" or "psychiatric nursing" or "psychiatric social workers" or "mental illness" or "acrophobia" or "acute stress disorder" or "adjustment disorder" or "affective disorders" or "affective psychoses" or "agoraphobia" or "akathisia" or "alcoholic psychoses" or "alexithymia" or "anhedonia" or "animal phobias" or "anorexia nervosa" or "anthropophobia" or "anxiety disorders" or "asperger s syndrome" or "attachment disorders" or "attention deficit disorder" or "attention deficit hyperactivity disorder" or "autism" or "autistic spectrum disorders" or "behaviour

disorders" or "binge eating" or "bipolar affective disorder" or "bulimia nervosa" or "cacodemonomania" or "capgras syndrome" or "catatonia" or "cenesthopathy" or "character disorders" or "childhood depression" or "childhood disintegrative disorder" or "childhood separation anxiety" or "chronic posttraumatic stress disorder" or "chronic psychiatric disorders" or "chronic schizophrenia" or "claustrophobia" or "combat disorders" or "combat related posttraumatic stress disorder" or "communication disorders" or "community psychiatric nurses" or "community psychiatric nursing" or "compulsive buying" or "compulsive eating" or "compulsive foraging behaviour" or "conduct disorders" or "confusional states" or "conversion disorder" or "coprophagia" or "cotard s syndrome" or "death depression" or "delusional depression" or "delusional disorders" or "demonomania" or "dental phobia" or "depersonalization disorder" or "depression" or "disruptive behaviour disorders" or "dissociative disorders" or "dysmorphophobia" or "dysphagia" or "eating disorders" or "emotional disorders" or "erotophobia" or "folie a deux" or "forensic psychiatric nurses" or "forensic psychiatric nursing" or "fregoli syndrome" or "generalized anxiety disorders" or "head banging" or "heller s syndrome" or "hyperphagia" or "hypomania" or "impulse control disorders" or "infantile autism" or "insanity" or "koro" or "korsakoff s syndrome" or "liaison psychiatric nurses" or "liaison psychiatric nursing" or "litigious delusional disorders" or "mania" or "mass psychogenic illness" or "maternal depression" or "medium security units" or "melancholia" or "military psychiatric hospitals" or "mood incongruent psychoses" or "movement disorders" or "neurasthenia" or "neuroleptic malignant syndrome" or "neuroses" or "neuroticism" or "nocturnal panic disorder" or "obsessive compulsive neuroses" or "oppositional defiant disorder" or "organic mood syndrome" or "panic disorders" or "paranoia" or "paranoid schizophrenia" or "paranoid states" or "paraphrenia" or "parental depression" or "paternal depression" or "personality disorders" or "pervasive developmental disorders" or "phobias" or "pica" or "postabortion syndrome" or "postnatal depression" or "posttraumatic stress disorder" or "private psychiatric hospitals" or "psychiatric clinics" or "psychiatric day centres" or "psychiatric day hospitals" or "psychiatric hospitals" or "psychiatric morbidity" or "psychiatric nurse patient interactions" or "psychiatric services" or "psychiatric social work" or "psychiatric staff nurses" or "psychiatric units" or "psychogenic aspects" or "psychogenic polydipsia" or "psychoses" or "psychotic mood disorders" or "psychoticism" or "puerperal psychosis" or "purging" or "querulous paranoia" or "rapid eating" or "refractory depression" or "restlessness" or "rett syndrome" or "schizoaffective disorder" or "schizophrenia" or "schizophreniform disorder" or "school phobia" or "seasonal affective disorders" or "sectioned patients" or "selective mutism" or "separation anxiety" or "shared paranoid disorder" or "snake phobia" or "social phobia" or "somatoform disorders" or "special hospitals" or "spider phobia" or "stage fright" or "thought disorder" or "transference neuroses" or "travelling psychiatric day hospitals" or "unipolar disorders" or "vascular depression" or "weight phobia")) or(DE=("community mental health professionals" or "community mental health services" or "managed mental health care" or "mental health" or "mental health care" or "mental

health perspectives" or "mental health professionals" or "mental health promotion" or "mental health services" or "mental illness" or "preventive mental health care" or "primary mental health care" or "student mental health services" or "anxiety" or "anxiety depression" or "childhood depression" or "death depression" or "delusional depression" or "depression" or "neuroticism" or "outpatient commitment" or "phobic anxiety" or "psychiatric services" or "psychiatric units" or "psychological services" or "psychoticism" or "sectioned patients" or "sectioning" or "social anxiety" or "support bed units"))) or(TI=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems") OR AB=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")) or(TI=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)) OR AB=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive

OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic))) or(TI=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*) OR AB=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*)) or(TI=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare") OR AB=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare"))) or(DE=("rehabilitation units" or "homeless mentally ill men" or "homeless mentally ill people" or "homeless mentally ill women" or "homeless mentally ill young people" or "insane people" or "long term mentally ill people" or "longterm mentally ill people" or "mentally ill boys" or "mentally ill children" or "mentally ill deaf children" or "mentally ill deaf people" or "mentally ill elderly men" or "mentally ill elderly people" or "mentally ill elderly women" or "mentally ill men" or

"mentally ill mothers" or "mentally ill older people" or "mentally ill parents" or "mentally ill people" or "mentally ill women" or "mentally ill young adults" or "mentally ill young children" or "mentally ill young people" or "psychopaths" or "violent mentally ill people")))

BRITISH NURSING INDEX

Database host: OVID
Database coverage dates: 1985-current
Search date: 13/2/2012
Number of records: 127
Date limits: 1985-2012

92 ((((histrionic ADJ1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic ADJ1 person*) OR (person* ADJ1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* ADJ1 obsessive) OR (obsessive ADJ1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* ADJ1 passive-aggressive) OR (passive-aggressive ADJ1 person*) OR phobia$ OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR (rett ADJ2 s) OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure ADJ1 unit$) OR (secure ADJ1 hospital$) OR amnesi* OR hypomania OR cyclothymia OR dysthymia OR dementia OR delirium OR hallucinosis OR delusional OR (mood ADJ2 disorder$) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance ADJ1 disorder$) OR (possession ADJ1 disorder$) OR obsessional OR "severe stress" OR (adjustment ADJ1 disorder$) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological ADJ1 disturbance$) OR (psychologically ADJ1 disturbed) OR suicid* OR parasuicid*))).ti,ab 15217
93 ((((self ADJ1 harm*) OR (self ADJ1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder$" OR "mental health" OR "mental healthcare" AND))).ti,ab 11002
94 ((((anankastic ADJ personalit*) OR "anorexia nervosa" OR (antisocial ADJ personalit*) OR ("attention deficit" ADJ disorder$) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic ADJ personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems" AND))).ti,ab 1801
95 (("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective ADJ1 disorder$) OR (avoidant ADJ1 personalit*) OR (behavio* ADJ1 problem$) OR (behavio* ADJ1 disorder$) OR (conversion ADJ1 disorder$) OR (eating ADJ1 behavio*) OR (eating ADJ1 disorder$) OR (overactive ADJ1 disorder$) OR (personality ADJ3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic ADJ1 person*) OR (antisocial ADJ1 person*) OR anxiety OR anxious OR (person* ADJ1 asocial) OR Asperger* OR autism OR autistic OR (person* ADJ1 avoidant) OR bipolar* OR (borderline ADJ1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive ADJ1 person*) OR (conversion ADJ1 disorder$) OR cyclothymia OR delusion* OR (dependent ADJ1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* ADJ1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* ADJ1 histrionic))).ti,ab 9380
96 92 OR 93 OR 94 OR 95 31158
99 PSYCHIATRIC DISORDERS/ OR exp AUTISM/ OR exp CHILD PSYCHIATRY/ OR exp DEMENTIA/ OR exp DEPRESSION/ OR exp EATING DISORDERS/ OR exp ELDERLY : MENTAL HEALTH/ OR exp NEUROSES AND PHOBIAS/ OR exp POST-TRAUMATIC STRESS/ OR exp PSYCHOSOMATIC DISORDERS/ OR exp SCHIZOPHRENIA/ OR exp SELF HARM/ OR exp SECURE PSYCHIATRIC HOSPITALS/ 12644
100 exp PSYCHIATRIC PATIENTS/ OR exp PSYCHIATRIC NURSING/ OR exp MENTAL HEALTH/ OR exp CHILD PSYCHIATRY/ OR exp ELDERLY : MENTAL HEALTH/ OR exp PSYCHIATRIC NURSING : EDUCATION/ OR exp PSYCHIATRIC PATIENTS/ OR exp MENTAL HEALTH : SERVICES/ OR PSYCHIATRIC REHABILITATION/ OR exp MENTAL HEALTH : COMMUNITY CARE/ OR exp SECURE

PSYCHIATRIC HOSPITALS/ OR exp COMMUNITY PSYCHIATRIC NURSING/ OR exp PSYCHIATRIC SERVICES/ 14154
101 96 OR 99 OR 100 33517
102 SMOKING/ 2432
103 (("temporary abstinence" OR (temporar* ADJ1 abstain*) OR (abstain* ADJ1 temporar*) OR (controlled ADJ1 smoking))).ti,ab 0
104 (((fading ADJ2 smok*) OR (temporary ADJ2 smok*) OR (cessat* ADJ2 smok*) OR (withdraw* ADJ2 smok*) OR (ceas* ADJ2 smok*) OR (stop* ADJ2 smok*) OR (schedul* ADJ2 smok*) OR (quit ADJ2 smok*) OR (quits ADJ2 smok*) OR (quitt* ADJ2 smok*) OR (reduc* ADJ2 smok*) OR (abstain* ADJ2 smok*) OR (prevent* ADJ2 smok*) OR (abstinence ADJ2 smok*) OR (restrict* ADJ2 smok*))).ti,ab 1064
105 (((fading ADJ2 tobacco) OR (temporary ADJ2 tobacco) OR (cessat* ADJ2 tobacco) OR (withdraw* ADJ2 tobacco) OR (ceas* ADJ2 tobacco) OR (stop* ADJ2 tobacco) OR (schedul* ADJ2 tobacco) OR (quit ADJ2 tobacco) OR (quits ADJ2 tobacco) OR (quitt* ADJ2 tobacco) OR (reduc* ADJ2 tobacco) OR (abstain* ADJ2 tobacco) OR (prevent* ADJ2 tobacco) OR (abstinence ADJ2 tobacco) OR (restrict* ADJ2 tobacco))).ti,ab 60
106 (((fading ADJ2 cigarette$) OR (temporary ADJ2 cigarette$) OR (cessat* ADJ2 cigarette$) OR (withdraw* ADJ2 cigarette$) OR (ceas* ADJ2 cigarette$) OR (stop* ADJ2 cigarette$) OR (schedul* ADJ2 cigarette$) OR (quit ADJ2 cigarette$) OR (quits ADJ2 cigarette$) OR (quitt* ADJ2 cigarette$) OR (reduc* ADJ2 cigarette$) OR (abstain* ADJ2 cigarette$) OR (prevent* ADJ2 cigarette$) OR (abstinence ADJ2 cigarette$) OR (restrict* ADJ2 cigarette$))).ti,ab 8
108 (("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)).ti,ab 14
109 ((cigar* OR smok* OR tobacco) AND ("give up" OR "gives up" OR "giving up")).ti,ab 101
110 102 OR 103 OR 104 OR 105 OR 106 OR 108 OR 109 2558
111 101 AND 110 127

CDC Smoking and Health Resource Library database

Search date: 8/2/2012
Number of records: 24

Four separate searches undertaken and results scanned results on title, from this potentially relevant items were selected.
Search, using publication year 1985 – 1990:

1. psychiatric AND control (keywords)
2. psychiatric AND cessation (keywords)
3. mental AND cessation (keywords)
4. mental AND control (keywords)

CINAHL (Cumulative Index of Nursing and Allied Health Literature)

Database host: OVID
Database coverage dates: 1981-current
Search date: 6/2/2012
Number of records: 1805
Date limits: 1985-2012

1 (("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective ADJ1 disorder$) OR (avoidant ADJ1 personalit*) OR (behavio* problem$) OR (behavio* ADJ1 disorder$) OR (conversion ADJ1 disorder$) OR (eating ADJ1 behavio*) OR (eating ADJ1 disorder$) OR (overactive ADJ1 disorder$) OR (personality ADJ3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic ADJ1 person*) OR (antisocial ADJ1 person*) OR anxiety OR anxious OR (person* ADJ1 asocial) OR Asperger* OR autism OR autistic OR (person* ADJ1 avoidant) OR bipolar* OR (borderline ADJ1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive ADJ1 person*) OR (conversion ADJ1 disorder$) OR cyclothymia OR delusion* OR (dependent ADJ1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* ADJ1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* ADJ1 histrionic))).ti,ab
2 (((histrionic ADJ1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic ADJ1 person*) OR (person* ADJ1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* ADJ1 obsessive) OR (obsessive ADJ1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* ADJ1 passive-aggressive) OR (passive-aggressive ADJ1 person*) OR phobia$ OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR (rett ADJ2 s) OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure ADJ1 unit$) OR (secure ADJ1 hospital$) OR amnesi* OR hypomania OR cyclothymia OR dysthymia OR dementia OR delirium OR hallucinosis OR delusional OR (mood ADJ2 disorder$) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance ADJ1 disorder$) OR (possession ADJ1 disorder$) OR obsessional OR "severe stress" OR (adjustment ADJ1 disorder$) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological ADJ1 disturbance$) OR (psychologically ADJ1 disturbed) OR suicid* OR parasuicid*)).ti,ab
3 (((self ADJ1 harm*) OR (self ADJ1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder$" OR "mental health" OR "mental healthcare")).ti,ab
4 (((anankastic ADJ personalit*) OR "anorexia nervosa" OR (antisocial ADJ personalit*) OR ("attention deficit" ADJ disorder$) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic ADJ personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")).ti,ab
5 ("temporary abstinence" OR (temporar* ADJ1 abstain*) OR (abstain* ADJ1 temporar*) OR (controlled ADJ1 smoking)).ti,ab
6 ((fading ADJ2 smok*) OR (temporary ADJ2 smok*) OR (cessat* ADJ2 smok*) OR (withdraw* ADJ2 smok*) OR (ceas* ADJ2 smok*) OR (stop* ADJ2 smok*) OR (schedul* ADJ2 smok*) OR (quit ADJ2 smok*) OR (quits ADJ2 smok*) OR (quitt* ADJ2 smok*) OR (reduc* ADJ2 smok*) OR (abstain* ADJ2 smok*) OR (prevent* ADJ2 smok*) OR (abstinence ADJ2 smok*) OR (restrict* ADJ2 smok*)).ti,ab
7 ((fading ADJ2 tobacco) OR (temporary ADJ2 tobacco) OR (cessat* ADJ2 tobacco) OR (withdraw* ADJ2 tobacco) OR (ceas* ADJ2 tobacco) OR (stop* ADJ2 tobacco) OR (schedul* ADJ2 tobacco) OR (quit ADJ2 tobacco) OR (quits ADJ2 tobacco) OR (quitt* ADJ2 tobacco) OR (reduc* ADJ2 tobacco)

OR (abstain* ADJ2 tobacco) OR (prevent* ADJ2 tobacco) OR (abstinence ADJ2 tobacco) OR (restrict* ADJ2 tobacco)).ti,ab
8 ((fading ADJ2 cigarette$) OR (temporary ADJ2 cigarette$) OR (cessat* ADJ2 cigarette$) OR (withdraw* ADJ2 cigarette$) OR (ceas* ADJ2 cigarette$) OR (stop* ADJ2 cigarette$) OR (schedul* ADJ2 cigarette$) OR (quit ADJ2 cigarette$) OR (quits ADJ2 cigarette$) OR (quitt* ADJ2 cigarette$) OR (reduc* ADJ2 cigarette$) OR (abstain* ADJ2 cigarette$) OR (prevent* ADJ2 cigarette$) OR (abstinence ADJ2 cigarette$) OR (restrict* ADJ2 cigarette$)).ti,ab
9 (fading OR temporary OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit$ OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*).ti,ab
10 ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars).ti,ab
11 9 AND 10
12 ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar* OR smok* OR tobacco).ti,ab
13 ("give up" OR "gives up" OR "giving up").ti,ab
14 12 AND 13
15 1 OR 2 OR 3 OR 4
16 5 OR 6 OR 7 OR 8 OR 11 OR 14
18 SMOKING/PC [PC=Prevention And Control]
19 SMOKING CESSATION/ OR SMOKING CESSATION PROGRAMS/
20 16 OR 18 OR 19
21 SOCIAL WORK, PSYCHIATRIC/ OR EMERGENCY SERVICES, PSYCHIATRIC/ OR COMMUNITY MENTAL HEALTH SERVICES/ OR MENTAL HEALTH SERVICES/
22 MENTAL HEALTH/ OR HOSPITALS, PSYCHIATRIC/ OR COMMUNITY MENTAL HEALTH NURSING/
23 exp MENTAL HEALTH PERSONNEL/ OR exp PSYCHIATRISTS/
24 exp COMMUNITY MENTAL HEALTH SERVICES/ OR exp SOCIAL WORK, PSYCHIATRIC/ OR exp EMERGENCY SERVICES, PSYCHIATRIC/
25 MENTALLY ILL OFFENDERS/ OR MENTAL DISORDERS, CHRONIC/
26 HOSPITALS, PSYCHIATRIC/ OR PSYCHIATRIC EMERGENCIES/ OR PSYCHIATRIC UNITS/ OR PSYCHIATRIC TECHNICIANS/ OR exp PSYCHIATRIC PATIENTS/
27 MENTAL DISORDERS/ OR exp ADJUSTMENT DISORDERS/ OR exp MENTAL DISORDERS DIAGNOSED IN CHILDHOOD/ OR exp NEUROTIC DISORDERS/ OR exp ORGANIC MENTAL DISORDERS/ OR exp PERSONALITY DISORDERS/ OR exp PSYCHOPHYSIOLOGIC DISORDERS/ OR exp PSYCHOTIC DISORDERS/ OR exp PREGNANCY COMPLICATIONS, PSYCHIATRIC/
29 ALZHEIMER'S DISEASE/
31 exp DYSLEXIA/
32 exp DEVELOPMENTAL DISABILITIES/
33 AUTISTIC DISORDER/
34 NEUROBEHAVIORAL MANIFESTATIONS/ OR exp CONFUSION/ OR exp CATATONIA/ OR exp COMMUNICATIVE DISORDERS/
35 CONSCIOUSNESS DISORDERS/ OR exp MEMORY DISORDERS/ OR exp PERCEPTUAL DISORDERS/ OR exp PSYCHOMOTOR DISORDERS
37 exp FACTITIOUS DISORDERS/ OR exp MUNCHAUSEN SYNDROME/ OR exp SOMATOFORM DISORDERS/ OR exp NEUROTIC DISORDERS/ OR exp AFFECTIVE DISORDERS/ OR exp ANXIETY DISORDERS/ OR exp DISSOCIATIVE DISORDERS/
38 RETT SYNDROME/
39 ATTENTION DEFICIT HYPERACTIVITY DISORDER/
40 BULIMIA/ OR BULIMIA NERVOSA/ OR exp FEEDING AND EATING DISORDERS OF CHILDHOOD/ OR exp EATING DISORDERS/

42 exp CHILD DEVELOPMENT DISORDERS, PERVASIVE/ OR exp COMMUNICATIVE DISORDERS/ OR exp MOTOR SKILLS DISORDERS/ OR exp REACTIVE ATTACHMENT DISORDER/ OR exp SEPARATION ANXIETY/ OR exp DEVELOPMENTAL DISABILITIES/ OR exp ATTENTION DEFICIT HYPERACTIVITY DISORDER/ OR exp MENTAL DISORDERS DIAGNOSED IN CHILDHOOD/
43 IMPULSE CONTROL DISORDERS/
44 ASTHENIA/
45 exp DYSKINESIAS/
46 exp STRESS DISORDERS, POST-TRAUMATIC/
47 HALLUCINATIONS/ OR exp PSYCHOTIC DISORDERS/
48 PANIC DISORDER/
49 REHABILITATION CENTERS/
50 21 OR 22 OR 23 OR 24 OR 25 OR 26 OR 27 OR 29 OR 31 OR 32 OR 33 OR 34 OR 35 OR 37 OR 38 OR 39 OR 40 OR 42 OR 43 OR 44 OR 45 OR 46 OR 47 OR 48 OR 49
51 15 OR 50
52 20 AND 51
60 exp SUICIDE/ OR exp DELIRIUM, DEMENTIA, AMNESTIC, COGNITIVE DISORDERS/ OR exp HYSTERIA/ OR exp PSYCHOMOTOR DISORDERS/ 50654
61 exp SOCIAL BEHAVIOR DISORDERS/
62 SOCIAL ANXIETY DISORDERS/
63 50 OR 60 OR 61 OR 62
64 51 OR 63
65 64 AND 20 [Limit to: Publication Year 1985-2012]

Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effectiveness, Health Technology Assessment databases

Database host: Cochrane Library
Search date: 30/1/2012
Number of records: 1009, of which:

- Cochrane Central Register of Controlled Trials, n=938,
- Cochrane Database of Systematic Reviews, n=32
- Database of Abstracts of Reviews of Effectiveness, n=15
- Health Technology Assessment database, n=3

Search strategy:
#1 "hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars:ti,ab,kw
#2 (fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*):ti,ab,kw
#3 (#1 AND #2)
#4 (tobacco NEXT control) OR (smoking NEXT control) OR (smoking NEAR/3 services) OR (smoking NEAR/3 service) OR (anti NEXT smoking) OR (anti NEXT tobacco) OR (control NEXT tobacco) OR (control NEXT smoking) OR (smoking NEXT anti) OR (tobacco NEXT anti):ti,ab,kw
#5 "temporary abstinence" OR (temporar* NEXT abstain*) OR (abstain* NEXT temporar*):ti,ab,kw
#6 (controlled NEXT smoking):ti,ab,kw
#7 ((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) NEAR/2 (smok* OR tobacco OR cigarette*)) :ti,ab,kw
#8 MeSH descriptor Smoking, this term only
#9 MeSH descriptor Tobacco Use Cessation explode all trees
#10 MeSH descriptor Smoking Cessation explode all trees
#11 (#3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10)
#12 (anankastic NEXT personalit*) OR "anorexia nervosa" OR (antisocial NEXT personalit*) OR ("attention deficit" NEXT disorder) OR "body dysmorphic" OR "conduct disorder" OR (cyclothymic NEXT personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems" OR "mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective NEXT disorder) :ti,ab,kw
#13 ((avoidant NEXT personalit*) OR (behavio* problem) OR (behavio* NEXT disorder*) OR (conversion NEXT disorder) OR (eating NEXT behavio*) OR (eating NEXT disorder) OR (overactive NEXT disorder) OR (personality NEAR/3 disorder*) OR agoraphobia OR Alzheimer* OR (person* NEXT anankastic) OR (anankastic NEXT person*) OR (person* NEXT antisocial) OR (antisocial NEXT person*) OR anxiety OR anxious OR (asocial NEXT person*) OR (person* NEXT asocial) OR Asperger* OR autism OR autistic OR (avoidant NEXT person*) OR (person* NEXT avoidant) OR bipolar* OR borderline NEXT personalit* OR bulimia OR catatonia OR catatonic OR compulsion* OR (person* NEXT compulsive) OR (compulsive NEXT person*) OR (conversion NEXT disorder*) OR cyclothymia OR delusion* OR (personalit* NEXT dependent) OR (dependent NEXT personalit*) OR depersonalization OR depersonalisation OR depression* OR depressive OR derealisation OR derealization OR disintegrative OR (person* NEXT dissocial) OR (dissocial NEXT person*) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR

(person* NEXT histrionic) OR (histrionic NEXT person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic NEXT person*) OR (person* NEXT narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* NEXT obsessive) OR (obsessive NEXT person*) OR oligophreni* OR paranoia OR paranoid OR (person* NEXT passive-aggressive) OR (passive-aggressive NEXT person*) OR phobia* OR phobic):ti,ab,kw
#14 (posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR rett NEAR/2 s OR retts OR schiz* OR sociopath* OR somatization OR somatisation OR somatoform):ti,ab,kw
#15 (secure unit*) OR (secure hospital*):ti,ab,kw
#16 (amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood NEAR/2 disorder) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance NEXT disorder) OR (possession NEXT disorder) OR obsessional OR "severe stress" OR (adjustment NEXT disorder) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological NEXT disturbance) OR (psychologically NEXT disturbed) OR suicid* OR parasuicid* OR (self NEXT harm*) OR (self NEXT injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders") :ti,ab,kw
#17 "mental health" OR "mental healthcare":ti,ab,kw
#18 MeSH descriptor Mental Health Services, this term only
#19 MeSH descriptor Community Mental Health Services, this term only
#20 MeSH descriptor Emergency Services, Psychiatric, this term only
#21 MeSH descriptor Social Work, Psychiatric explode all trees
#22 MeSH descriptor Mentally Ill Persons, this term only
#23 MeSH descriptor Psychiatric Department, Hospital, this term only
#24 MeSH descriptor Hospitals, Psychiatric, this term only
#25 MeSH descriptor Psychiatric Nursing, this term only
#26 MeSH descriptor Mental Health, this term only
#27 MeSH descriptor Rehabilitation Centers, this term only
#28 MeSH descriptor Adjustment Disorders, this term only
#29 MeSH descriptor Amnesia explode all trees
#30 MeSH descriptor Attention Deficit and Disruptive Behavior Disorders explode all trees
#31 MeSH descriptor Binge-Eating Disorder, this term only
#32 MeSH descriptor Capgras Syndrome, this term only
#33 MeSH descriptor Child Development Disorders, Pervasive explode all trees
#34 MeSH descriptor Cognition Disorders explode all trees
#35 MeSH descriptor Communication Disorders explode all trees
#36 MeSH descriptor Coprophagia explode all trees
#37 MeSH descriptor Delirium explode all trees
#38 MeSH descriptor Dementia explode all trees
#39 MeSH descriptor Depressive Disorder explode all trees
#40 MeSH descriptor Developmental Disabilities, this term only
#41 MeSH descriptor Dyslexia, Acquired explode all trees
#42 MeSH descriptor Factitious Disorders, this term only
#43 MeSH descriptor Feeding and Eating Disorders of Childhood explode all trees
#44 MeSH descriptor Impulse Control Disorders, this term only
#45 MeSH descriptor Mental Disorders Diagnosed in Childhood, this term only
#46 MeSH descriptor Motor Skills Disorders, this term only
#47 MeSH descriptor Munchausen Syndrome, this term only
#48 MeSH descriptor Neurocirculatory Asthenia, this term only
#49 MeSH descriptor Obsessive-Compulsive Disorder explode all trees
#50 MeSH descriptor Pica explode all trees

#51 MeSH descriptor Psychotic Disorders explode all trees
#52 MeSH descriptor Schizophrenia and Disorders with Psychotic Features, this term only
#53 MeSH descriptor Schizophrenia explode all trees
#54 MeSH descriptor Stereotypic Movement Disorder, this term only
#55 MeSH descriptor Stress Disorders, Traumatic explode all trees
#56 MeSH descriptor Affective Disorders, Psychotic explode all trees
#57 MeSH descriptor Anxiety Disorders explode all trees
#58 MeSH descriptor Anorexia Nervosa, this term only
#59 MeSH descriptor Bulimia Nervosa, this term only
#60 MeSH descriptor Bulimia, this term only
#61 MeSH descriptor Anxiety, this term only
#62 MeSH descriptor Personality Disorders explode all trees
#63 MeSH descriptor Alzheimer Disease, this term only
#64 MeSH descriptor Attention Deficit Disorder with Hyperactivity explode all trees
#65 MeSH descriptor Body Dysmorphic Disorders explode all trees
#66 MeSH descriptor Catatonia, this term only
#67 MeSH descriptor Child Behavior Disorders, this term only
#68 MeSH descriptor Compulsive Behavior, this term only
#69 MeSH descriptor Cyclothymic Disorder, this term only
#70 MeSH descriptor Delirium, Dementia, Amnestic, Cognitive Disorders explode all trees
#71 MeSH descriptor Dementia explode all trees
#72 MeSH descriptor Dependency (Psychology), this term only
#73 MeSH descriptor Depersonalization, this term only
#74 MeSH descriptor Depression, this term only
#75 MeSH descriptor Depressive Disorder, Major, this term only
#76 MeSH descriptor Dysthymic Disorder, this term only
#77 MeSH descriptor Dissociative Disorders explode all trees
#78 MeSH descriptor Eating Disorders, this term only
#79 MeSH descriptor Feeding Behavior, this term only
#80 MeSH descriptor Hallucinations, this term only
#81 MeSH descriptor Hysteria, this term only
#82 MeSH descriptor Mental Disorders, this term only
#83 MeSH descriptor Mood Disorders, this term only
#84 MeSH descriptor Personality Disorders, this term only
#85 MeSH descriptor Neurotic Disorders, this term only
#86 MeSH descriptor Obsessive Behavior, this term only
#87 MeSH descriptor Obsessive-Compulsive Disorder, this term only
#88 MeSH descriptor Panic, this term only
#89 MeSH descriptor Paranoid Disorders explode all trees
#90 MeSH descriptor Psychiatry explode all trees
#91 MeSH descriptor Psychophysiologic Disorders, this term only
#92 MeSH descriptor Psychotic Disorders, this term only
#93 MeSH descriptor Rett Syndrome, this term only
#94 MeSH descriptor Schizophrenia, Childhood, this term only
#95 MeSH descriptor Shared Paranoid Disorder, this term only
#96 MeSH descriptor Social Behavior Disorders, this term only
#97 MeSH descriptor Somatoform Disorders, this term only
#98 (#12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR

#30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR

#49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 OR #60 OR #61 OR #62 OR #63 OR #64 OR #65 OR #66 OR #67 OR

#68 OR #69 OR #70 OR #71 OR #72 OR #73 OR #74 OR #75 OR #76 OR #77 OR #78 OR #79 OR #80 OR #81 OR #82 OR #83 OR #84 OR #85 OR #86 OR

#87 OR #88 OR #89 OR #90 OR #91 OR #92 OR #93 OR #94 OR #95 OR #96 OR #97)
#99 (#11 AND #98)
#100 (#99), from 1985 to 2012

Conference Papers Index

Database host: CSA Illumina
Database coverage dates: 1982-current
Search date: 31/1/2012
Number of records: 83
Date limits: 2008-2012

Database: Conference Papers Index
Query: (((TI=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems") OR AB=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")) or(TI=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*) OR AB=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally

labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*)) or(TI=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare") OR AB=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare")) or(TI=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)) OR AB=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)))) OR (KW=(psychosis or depression) or DE=(anxiety or (mental disorders) or schizophrenia or bipolar or depression))) AND ((DE=smoking or "tobacco smoking" OR "cigarettes" OR "cigarette smoking") OR (((TI=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)

OR AB=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)) and(TI=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) OR AB=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*))) or(TI=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti) OR AB=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti)) or(TI=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*) OR AB=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*)) or(TI=("controlled smoking") OR AB=("controlled smoking")) or(TI=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*))) or(AB=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*)))))

Database of Promoting Health Effectiveness Reviews (DoPHER) and Trials Register of Promoting Health Interventions (TRoPHI)

Search date: 3/2/2012
Number of records: (59 DoPHER, 89 TRoPHI)

Search strategy:

1 Focus of the report: mental health
2 Focus of the report: eating disorder
3 Focus of the report: Suicide
4 Freetext (item record) "mental health*"
5 Freetext (item record) "psychiatr*"
6 Freetext (item record) "depressi*"
7 Freetext (item record) "disorder*"
8 Freetext (item record) "personalit*"
9 Freetext (item record) "schizo*"
10 Freetext (item record) "suicid*"
11 Freetext (item record) "comorbid*"
12 Freetext (item record) "mental*"
13 Freetext (item record) "anorex*"
14 Freetext (item record) "bulimi*"
15 Freetext (item record) "obessive*"
16 Freetext (item record) "compulsiv*"
17 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 12 OR 13 OR 14 OR 15 OR 16
18 Focus of the report: tobacco
19 Freetext (item record) "tobacco*"
20 Freetext (item record) "smoking"
21 Freetext (item record) "cigar*"
22 18 OR 19 OR 20 OR 21
23 17 AND 22

EMBASE

Database host: OVID
Database coverage dates: 1980-current
Search date: 9/2/2012
Number of records: 5989
Date limits: 1985-2012

2 (((histrionic ADJ1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic ADJ1 person*) OR (person* ADJ1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* ADJ1 obsessive) OR (obsessive ADJ1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* ADJ1 passive-aggressive) OR (passive-aggressive ADJ1 person*) OR phobia$ OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR (rett ADJ2 s) OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure ADJ1 unit$) OR (secure ADJ1 hospital$) OR amnesi* OR hypomania OR cyclothymia OR dysthymia OR dementia OR delirium OR hallucinosis OR delusional OR (mood ADJ2 disorder$) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance ADJ1 disorder$) OR (possession ADJ1 disorder$) OR obsessional OR "severe stress" OR (adjustment ADJ1 disorder$) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological ADJ1 disturbance$) OR (psychologically ADJ1 disturbed) OR suicid* OR parasuicid*)).ti,ab 756398
3 (((self ADJ1 harm*) OR (self ADJ1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder$" OR "mental health" OR "mental healthcare")).ti,ab 286348
4 (((anankastic ADJ personalit*) OR "anorexia nervosa" OR (antisocial ADJ personalit*) OR ("attention deficit" ADJ disorder$) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic ADJ personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")).ti,ab 57941
5 ("temporary abstinence" OR (temporar* ADJ1 abstain*) OR (abstain* ADJ1 temporar*) OR (controlled ADJ1 smoking)).ti,ab 139
6 ((fading ADJ2 smok*) OR (temporary ADJ2 smok*) OR (cessat* ADJ2 smok*) OR (withdraw* ADJ2 smok*) OR (ceas* ADJ2 smok*) OR (stop* ADJ2 smok*) OR (schedul* ADJ2 smok*) OR (quit ADJ2 smok*) OR (quits ADJ2 smok*) OR (quitt* ADJ2 smok*) OR (reduc* ADJ2 smok*) OR (abstain* ADJ2 smok*) OR (prevent* ADJ2 smok*) OR (abstinence ADJ2 smok*) OR (restrict* ADJ2 smok*)).ti,ab 26275
7 ((fading ADJ2 tobacco) OR (temporary ADJ2 tobacco) OR (cessat* ADJ2 tobacco) OR (withdraw* ADJ2 tobacco) OR (ceas* ADJ2 tobacco) OR (stop* ADJ2 tobacco) OR (schedul* ADJ2 tobacco) OR (quit ADJ2 tobacco) OR (quits ADJ2 tobacco) OR (quitt* ADJ2 tobacco) OR (reduc* ADJ2 tobacco) OR (abstain* ADJ2 tobacco) OR (prevent* ADJ2 tobacco) OR (abstinence ADJ2 tobacco) OR (restrict* ADJ2 tobacco)).ti,ab 3874
8 ((fading ADJ2 cigarette$) OR (temporary ADJ2 cigarette$) OR (cessat* ADJ2 cigarette$) OR (withdraw* ADJ2 cigarette$) OR (ceas* ADJ2 cigarette$) OR (stop* ADJ2 cigarette$) OR (schedul* ADJ2 cigarette$) OR (quit ADJ2 cigarette$) OR (quits ADJ2 cigarette$) OR (quitt* ADJ2 cigarette$) OR (reduc* ADJ2 cigarette$) OR (abstain* ADJ2 cigarette$) OR (prevent* ADJ2 cigarette$) OR (abstinence ADJ2 cigarette$) OR (restrict* ADJ2 cigarette$)).ti,ab 1828
9 (fading OR temporary OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit$ OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*).ti,ab 3423659
10 ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars).ti,ab 3349
11 9 AND 10 966

12 ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar* OR smok* OR tobacco).ti,ab 223256
13 ("give up" OR "gives up" OR "giving up").ti,ab 2603
14 12 AND 13 743
15 SMOKING CESSATION/ OR SMOKING CESSATION PROGRAM/ 30596
16 SMOKING/pc 6748
17 TOBACCO DEPENDENCE/pc [pc=Prevention] 1105
18 PSYCHOGERIATRIC NURSING/ OR COMMUNITY PSYCHIATRIC NURSING/ OR PSYCHIATRIC NURSING/ 13716
19 PSYCHIATRIC DEPARTMENT/ OR PSYCHIATRIC DEPARTMENT, HOSPITAL/ 5358
20 MENTAL HEALTH CARE/ OR MENTAL HEALTH SERVICE/ OR exp MENTAL HOSPITAL [+NT]/ OR exp PSYCHIATRIC NURSING [+NT]/ 82551
21 COMMUNITY MENTAL HEALTH/ OR MENTAL HEALTH/ 56365
22 SUICIDE/ 35148
23 DISORDERS OF HIGHER CEREBRAL FUNCTION/ OR ALIEN HAND SYNDROME/ OR APRAXIA/ OR ATTENTION DISTURBANCE/ OR CATALEPSY/ OR COGNITIVE DEFECT/ OR DEVELOPMENTAL COORDINATION DISORDER/ OR DISORIENTATION/ OR DYSPRAXIA/ OR MILD COGNITIVE IMPAIRMENT/ OR exp AGNOSIA [+NT]/ OR exp CONFUSION [+NT]/ OR exp DELIRIUM [+NT]/ OR exp EMOTIONAL INCONTINENCE [+NT]/ OR exp MEMORY DISORDER [+NT]/ 145045
24 exp SOCIAL PHOBIA/ OR exp ANXIETY/ OR exp ANXIETY NEUROSIS/ 101762
25 HYSTERIA/ 5169
26 DAY HOSPITAL/ OR HALFWAY HOUSE/ OR MENTAL HOSPITAL/ OR MENTAL HEALTH CARE/ 39103
27 POSTTRAUMATIC STRESS DISORDER/ OR exp ANXIETY DISORDER/ 116510
28 PSYCHOSOMATIC DISORDER/ OR exp SOMATOFORM DISORDER/ OR exp BODY DYSMORPHIC DISORDER/ OR exp CARDIAC ANXIETY/ OR exp CONVERSION DISORDER/ OR exp DELUSIONAL PARASITOSIS/ OR exp DELUSIONAL PREGNANCY/ OR exp MASKED DEPRESSION/ OR exp PSYCHOGENIC PAIN/ OR exp SOMATIC DELUSION/ OR exp SOMATIZATION/ 27684
29 exp PARANOIA/ OR exp DELUSION/ OR exp PARANOID PSYCHOSIS/ 21153
30 exp SCHIZOPHRENIA/ OR exp SCHIZOAFFECTIVE PSYCHOSIS/ OR exp OBSESSIVE COMPULSIVE DISORDER/ OR exp PSYCHOSIS/ OR exp SCHIZOIDISM/ OR exp BIPOLAR DISORDER/ OR exp OBSESSION/ 218394
31 exp RETT SYNDROME/ OR exp AUTISM/ OR exp DEMENTIA/ 204375
32 HYPERVENTILATION SYNDROME/ OR PSYCHOSOCIAL WITHDRAWAL/ OR PSYCHOSOMATIC DISORDER/ OR exp FACTITIOUS DISEASE [+NT]/ 18894
33 MENTAL STRESS/ 49283
34 NEURASTHENIA/ 1486
35 exp PERSONALITY DISORDER/ 39808
36 exp NARCISSISM/ OR exp DEPRESSION/ 259332
37 exp DISSOCIATIVE FUGUE/ OR exp DISSOCIATIVE DISORDER/ OR exp DISSOCIATIVE AMNESIA/ 5118
38 exp DEPERSONALIZATION/ 2143
39 exp PSYCHIATRY/ 85817
40 exp DELUSION/ 16488
41 exp CYCLOTHYMIA/ OR exp BIPOLAR DISORDER/ OR exp DYSTHYMIA/ OR exp BIPOLAR II DISORDER/ OR exp MAJOR DEPRESSION/ 60125
42 exp CATATONIA/ 2732
43 exp EATING DISORDER/ OR exp APPETITE DISORDER/ OR exp BULIMIA/ 66605
44 exp ATTENTION DEFICIT DISORDER/ 28466
45 exp ALZHEIMER DISEASE/ 98856

46 REHABILITATION CENTER/ 7356
47 COORDINATION DISORDER/ OR DEVELOPMENTAL COORDINATION DISORDER/ 1264
48 exp ASTHENIA/ 15057
49 exp MUNCHAUSEN SYNDROME/ 1618
50 exp PSYCHOMOTOR DISORDER/ 41977
51 exp DEVELOPMENTAL DISORDER/ 21356
52 IMPULSE CONTROL DISORDER/ 1515
53 exp COMMUNICATION DISORDER/ 39414
54 exp COGNITIVE DEFECT/ 72350
57 5 OR 6 OR 7 OR 8 OR 11 OR 14 OR 15 OR 16 OR 17 46755
59 exp ANIMALS/ 1668187
60 NONHUMAN/ 3785601
61 EXP HUMAN/ 12891299
65 ("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective ADJ1 disorder$) OR (avoidant ADJ1 personalit*) OR (behavio* ADJ1 problem$) OR (behavio* ADJ1 disorder$) OR (conversion ADJ1 disorder$) OR (eating ADJ1 behavio*) OR (eating ADJ1 disorder$) OR (overactive ADJ1 disorder$) OR (personality ADJ3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic ADJ1 person*) OR (antisocial ADJ1 person*) OR anxiety OR anxious OR (person* ADJ1 asocial) OR Asperger* OR autism OR autistic OR (person* ADJ1 avoidant) OR bipolar* OR (borderline ADJ1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive ADJ1 person*) OR (conversion ADJ1 disorder$) OR cyclothymia OR delusion* OR (dependent ADJ1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* ADJ1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* ADJ1 histrionic)).ti,ab [Limit to: Publication Year 1990-2012] 523278
70 CONDUCT DISORDER/ OR PSYCHOSOCIAL DISORDER/ 6975
73 exp SUICIDAL BEHAVIOR/ 57025
79 (MENTAL OVERSTIMULATION/ OR ORGANIC BRAIN SYNDROME/ OR ORGANIC PSYCHOSYNDROME/) AND 57 2
125 MOOD DISORDER/ OR AFFECTIVE NEUROSIS/ OR AFFECTIVE PSYCHOSIS/ OR BLUNTED AFFECT/ OR MAJOR AFFECTIVE DISORDER/ OR MINOR AFFECTIVE DISORDER/ OR SCHIZOAFFECTIVE PSYCHOSIS/ OR exp MANIA [+NT]/ 71967
126 MENTAL DISEASE/ OR ADJUSTMENT DISORDER/ OR ALEXITHYMIA/ OR EMOTIONAL DISORDER/ OR MENTAL INSTABILITY/ OR MENTAL OVERSTIMULATION/ OR ORGANIC BRAIN SYNDROME/ OR ORGANIC PSYCHOSYNDROME/ OR PSYCHOTRAUMA/ OR exp ANXIETY DISORDER [+NT]/ OR exp AUTISM [+NT]/ OR exp CONFUSION [+NT]/ OR exp DELIRIUM [+NT]/ OR exp DEMENTIA [+NT]/ OR exp DISSOCIATIVE DISORDER [+NT]/ OR exp LEARNING DISORDER [+NT]/ OR exp MEMORY DISORDER [+NT]/ OR exp NEUROSIS [+NT]/ OR exp PERSONALITY DISORDER [+NT]/ OR exp PSYCHOSIS [+NT]/ OR exp THOUGHT DISORDER [+NT]/ 726684
131 DEPRESSION/co,cn,di,dr,dt,ep,et,rt,si,su,th [co=Complication, cn=Congenital Disorder, di=Diagnosis, dr=Drug Resistance, dt=Drug Therapy, ep=Epidemiology, et=Etiology, rt=Radiotherapy, si=Side Effect, su=Surgery, th=Therapy] 101002
139 ABNORMAL BEHAVIOR/ OR BEHAVIOR DISORDER/ OR ATTENTION DEFICIT DISORDER/ OR AUTOMUTILATION/ OR CONGENITAL BEHAVIOR DISORDER/ OR COPROPHAGY/ OR DISRUPTIVE BEHAVIOR/ OR IMPULSE CONTROL DISORDER/ OR OPPOSITIONAL DEFIANT DISORDER/ OR exp EATING DISORDER [+NT]/ OR exp PERCEPTION DISORDER [+NT]/ OR exp PSYCHOMOTOR DISORDER [+NT]/ OR PSYCHOSOCIAL DISORDER/ OR exp SOCIOPATHY [+NT]/ OR exp SUICIDAL BEHAVIOR [+NT]/ 311562
140 36 not 131 158330
141 exp NARCISSISM/ 4049

144 ("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective ADJ1 disorder$) OR (avoidant ADJ1 personalit*) OR (behavio* ADJ1 problem$) OR (behavio* ADJ1 disorder$) OR (conversion ADJ1 disorder$) OR (eating ADJ1 behavio*) OR (eating ADJ1 disorder$) OR (overactive ADJ1 disorder$) OR (personality ADJ3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic ADJ1 person*) OR (antisocial ADJ1 person*) OR anxiety OR anxious OR (person* ADJ1 asocial) OR Asperger* OR autism OR autistic OR (person* ADJ1 avoidant) OR bipolar* OR (borderline ADJ1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive ADJ1 person*) OR (conversion ADJ1 disorder$) OR cyclothymia OR delusion* OR (dependent ADJ1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* ADJ1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* ADJ1 histrionic)).ti,ab 629953
145 2 OR 3 OR 4 OR 18 OR 19 OR 20 OR 21 OR 22 OR 23 OR 24 OR 25 OR 26 OR 27 OR 28 OR 29 OR 30 OR 31 OR 32 OR 33 OR 34 OR 35 OR 37 OR 38 OR 39 OR 40 OR 41 OR 42 OR 43 OR 44 OR 45 OR 46 OR 47 OR 48 OR 49 OR 50 OR 51 OR 52 OR 53 OR 54 OR 70 OR 73 OR 79 OR 125 OR 126 OR 139 OR 140 OR 141 OR 144 1917356
146 145 AND 57 6234
147 59 OR 60 5437441
148 147 AND 61 1100352
149 147 NOT 148 4337089
150 146 NOT 149 6099
151 150 [Limit to: Publication Year 1985-2012] 5972

HEALTH EVIDENCE CANADA

Search date: 8/2/2012
Number of records: 42 items

Searched on pre-defined categories:
(Tobacco OR Smoking Cessation) AND (Community health centre OR Correctional institution OR Day care centre OR Health departments OR Hospice OR Hospital OR Nursing home/long-term care facility OR Residential centre)
Scanned records on title, and saved 42 records.

HMIC

Database host: OVID
Search date: 6/2/2012
Number of records: 250
Date limits: 1985-2012

1. (("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective ADJ1 disorder$) OR (avoidant ADJ1 personalit*) OR (behavio* problem$) OR (behavio* ADJ1 disorder$) OR (conversion ADJ1 disorder$) OR (eating ADJ1 behavio*) OR (eating ADJ1 disorder$) OR (overactive ADJ1 disorder$) OR (personality ADJ3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic ADJ1 person*) OR (antisocial ADJ1 person*) OR anxiety OR anxious OR (person* ADJ1 asocial) OR Asperger* OR autism OR autistic OR (person* ADJ1 avoidant) OR bipolar* OR (borderline ADJ1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive ADJ1 person*) OR (conversion ADJ1 disorder$) OR cyclothymia OR delusion* OR (dependent ADJ1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* ADJ1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* ADJ1 histrionic))).ti,ab; 10775 results.
2. (((histrionic ADJ1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic ADJ1 person*) OR (person* ADJ1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* ADJ1 obsessive) OR (obsessive ADJ1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* ADJ1 passive-aggressive) OR (passive-aggressive ADJ1 person*) OR phobia$ OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR (rett ADJ2 s) OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure ADJ1 unit$) OR (secure ADJ1 hospital$) OR amnesi* OR hypomania OR cyclothymia OR dysthymia OR dementia OR delirium OR hallucinosis OR delusional OR (mood ADJ2 disorder$) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance ADJ1 disorder$) OR (possession ADJ1 disorder$) OR obsessional OR "severe stress" OR (adjustment ADJ1 disorder$) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological ADJ1 disturbance$) OR (psychologically ADJ1 disturbed) OR suicid* OR parasuicid*)).ti,ab; 14797 results.
3. (((self ADJ1 harm*) OR (self ADJ1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder$" OR "mental health" OR "mental healthcare")).ti,ab; 16420 results.
4. (((anankastic ADJ personalit*) OR "anorexia nervosa" OR (antisocial ADJ personalit*) OR ("attention deficit" ADJ disorder$) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic ADJ personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")).ti,ab; 3718 results.
5. ("temporary abstinence" OR (temporar* ADJ1 abstain*) OR (abstain* ADJ1 temporar*) OR (controlled ADJ1 smoking)).ti,ab; 3 results.
6. ((fading ADJ2 smok*) OR (temporary ADJ2 smok*) OR (cessat* ADJ2 smok*) OR (withdraw* ADJ2 smok*) OR (ceas* ADJ2 smok*) OR (stop* ADJ2 smok*) OR (schedul* ADJ2 smok*) OR (quit ADJ2 smok*) OR (quits ADJ2 smok*) OR (quitt* ADJ2 smok*) OR (reduc* ADJ2 smok*) OR (abstain* ADJ2 smok*) OR (prevent* ADJ2 smok*) OR (abstinence ADJ2 smok*) OR (restrict* ADJ2 smok*)).ti,ab; 1759 results.

7. ((fading ADJ2 tobacco) OR (temporary ADJ2 tobacco) OR (cessat* ADJ2 tobacco) OR (withdraw* ADJ2 tobacco) OR (ceas* ADJ2 tobacco) OR (stop* ADJ2 tobacco) OR (schedul* ADJ2 tobacco) OR (quit ADJ2 tobacco) OR (quits ADJ2 tobacco) OR (quitt* ADJ2 tobacco) OR (reduc* ADJ2 tobacco) OR (abstain* ADJ2 tobacco) OR (prevent* ADJ2 tobacco) OR (abstinence ADJ2 tobacco) OR (restrict* ADJ2 tobacco)).ti,ab; 156 results.
8. ((fading ADJ2 cigarette$) OR (temporary ADJ2 cigarette$) OR (cessat* ADJ2 cigarette$) OR (withdraw* ADJ2 cigarette$) OR (ceas* ADJ2 cigarette$) OR (stop* ADJ2 cigarette$) OR (schedul* ADJ2 cigarette$) OR (quit ADJ2 cigarette$) OR (quits ADJ2 cigarette$) OR (quitt* ADJ2 cigarette$) OR (reduc* ADJ2 cigarette$) OR (abstain* ADJ2 cigarette$) OR (prevent* ADJ2 cigarette$) OR (abstinence ADJ2 cigarette$) OR (restrict* ADJ2 cigarette$)).ti,ab; 80 results.
9. (fading OR temporary OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit$ OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*).ti,ab; 38005 results.
10. ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars).ti,ab; 55 results.
11. 9 AND 10; 25 results.
12. ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar* OR smok* OR tobacco).ti,ab; 7327 results.
13. ("give up" OR "gives up" OR "giving up").ti,ab; 254 results.
14. 12 AND 13; 156 results.
15. SMOKING CONTROL/; 432 results.
16. SMOKING CESSATION/; 1527 results.
17. 5 OR 6 OR 7 OR 8 OR 11 OR 14 OR 15 OR 16; 2600 results.
18. exp MENTAL ILLNESS/; 6061 results.
19. MENTAL HEALTH OFFICERS/ OR MENTAL HEALTH SERVICES/ OR PSYCHIATRY/ OR ORTHOPSYCHIATRY/; 7464 results.
20. exp PSYCHIATRY/ OR exp PSYCHIATRIC TREATMENT/ OR exp PSYCHIATRISTS/ OR exp ORTHOPSYCHIATRY/ OR exp MENTAL HEALTH CARE/ OR exp MENTAL HEALTH/ OR exp MENTAL DISORDERS/; 27130 results.
21. exp MENTAL HEALTH CARE/ OR exp MENTAL HEALTH SERVICES/ OR exp MENTAL HEALTH UNITS/ OR exp PSYCHIATRIC PRISONS/ OR exp MENTAL HEALTH NURSING HOMES/ OR exp MENTAL HEALTH HOSPITALS/; 13660 results.
22. exp MENTAL HEALTH SOCIAL WORK/; 560 results.
23. exp MENTAL HEALTH UNITS/ OR exp PSYCHIATRIC EMERGENCY SERVICES/ OR exp PSYCHIATRIC TREATMENT/ OR exp MENTAL HEALTH DAY CENTRES/ OR exp MENTAL HEALTH HOSPITALS/ OR exp MENTAL HEALTH CARE/; 6388 results.
24. 1 OR 2 OR 3 OR 4 OR 18 OR 19 OR 20 OR 21 OR 22 OR 23 ; 44219 results.
25. SMOKING TREATMENT/; 99 results.
26. 17 OR 25; 2608 results.
27. 24 AND 26; 257 results.
28. 27 [Limit to: Publication Year 1985-Current]; 250 results.

International Bibliography of Social Sciences

Database host: CSA Illumina
Database coverage dates: 1951-current
Search Date: 3/2/2012
Date limits: 1985-2012
Number of records: 204

Query: ((DE=("alzheimer s disease" or "anxiety" or "dementia" or "depression" or "madness" or "mental deficiencies" or "mental health" or "mental hospitals" or "mental illness" or "mental stress" or "neuroses" or "personality disorders" or "post traumatic stress disorder" or "psychiatrists" or "psychoses" or "schizophrenia")) or(TI=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems") OR AB=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems") or TI=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*) OR AB=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1

units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*)) or(TI=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare") OR AB=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare")) or(TI=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)) OR AB=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)))) and((((TI=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR

cigars) OR AB=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)) and(TI=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) OR AB=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*))) or(TI=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti) OR AB=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti)) or(TI=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*) OR AB=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*)) or(TI=("controlled smoking") OR AB=("controlled smoking")) or(TI=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*))) or(AB=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*)))) or(DE="smoking" or DE="tobacco"))

MEDLINE, INCLUDING MEDLINE IN PROCESS

Database host: EBSCO host
Date: 30 January 2011
Results: 3732

#	Query
S37	**S33 NOT S36 (3732 records)** Limiters - Date of Publication from: 19850101-20121231
S36	S35 NOT S34
S35	MH ("Animals")
S34	MH ("Humans") AND MH ("Animals")
S33	S16 AND S32
S32	S17 or S18 or S19 or S20 or S21 or S22 or S23 or S24 or S25 or S26 or S27 or S28 or S29 or S30 or S31
S31	AB ("mental health" OR "mental healthcare")
S30	TI ("mental health" OR "mental healthcare")
S29	AB (amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood W2 disorder#) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance W1 disorder#) OR (possession W1 disorder#) OR obsessional OR "severe stress" OR (adjustment W1 disorder#) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological W1 disturbance#) OR (psychologically W1 disturbed) OR suicid* OR parasuicid* OR (self W1 harm*) OR (self W1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders")
S28	TI (amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood W2 disorder#) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance W1 disorder#) OR (possession W1 disorder#) OR obsessional OR "severe stress" OR (adjustment W1 disorder#) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological W1 disturbance#) OR (psychologically W1 disturbed) OR suicid* OR parasuicid* OR (self W1 harm*) OR (self W1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders")
S27	AB ("secure unit#" OR "secure hospital#")
S26	TI ("secure unit#" OR "secure hospital#")
S25	AB ("anankastic personalit*" OR "anorexia nervosa" OR "antisocial personalit*" OR "attention deficit disorder#" OR "body dysmorphic" OR "conduct disorder" OR "cyclothymic personalit*" OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems" OR "mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR "affective disorder*" OR "avoidant personalit*" OR "behavio#r disorder*" OR "behavio#r problem*" OR "behavioral disorder#" OR "behavioural disorder#" OR "conversion disorder *" OR "eating behavio#r" OR "eating W1 disorder#" OR "overactive disorder#" OR (personality N3 disorder#) OR agoraphobia OR Alzheimer* OR (anankastic N1 person*) OR (antisocial N1 person*) OR anxiety OR anxious OR (asocial N1 person*) OR Asperger* OR autism OR autistic OR (avoidant N1 person*) OR bipolar* OR "borderline personalit*" OR bulimia OR

	catatonia OR catatonic OR compulsion* OR (compulsive N1 person*) OR (conversion W1 disorder*) OR cyclothymia OR delusion* OR (dependent N1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (dissocial N1 person*) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (histrionic N1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic N1 person*) OR neurasthenia OR neurosis OR neurot* OR (obsessive N1 person*) OR oligophreni* OR paranoia OR paranoid OR (passive-aggressive N1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR rett?s OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform)
S24	TI ("anankastic personalit*" OR "anorexia nervosa" OR "antisocial personalit*" OR "attention deficit disorder#" OR "body dysmorphic" OR "conduct disorder" OR "cyclothymic personalit*" OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems" OR "mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR "affective disorder*" OR "avoidant personalit*" OR "behavio#r disorder*" OR "behavio#r problem*" OR "behavioral disorder#" OR "behavioural disorder#" OR "conversion disorder *" OR "eating behavio#r" OR "eating W1 disorder#" OR "overactive disorder#" OR (personality N3 disorder#) OR agoraphobia OR Alzheimer* OR (anankastic N1 person*) OR (antisocial N1 person*) OR anxiety OR anxious OR (asocial N1 person*) OR Asperger* OR autism OR autistic OR (avoidant N1 person*) OR bipolar* OR "borderline personalit*" OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive N1 person*) OR (conversion W1 disorder*) OR cyclothymia OR delusion* OR (dependent N1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (dissocial N1 person*) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (histrionic N1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic N1 person*) OR neurasthenia OR neurosis OR neurot* OR (obsessive N1 person*) OR oligophreni* OR paranoia OR paranoid OR (passive-aggressive N1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR rett?s OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform)
S23	MH (("Adjustment Disorders") OR ("Amnesia+") OR ("Attention Deficit and Disruptive Behavior Disorders+") OR ("Binge-Eating Disorder") OR ("Capgras Syndrome") OR ("Child Development Disorders, Pervasive+") OR ("Cognition Disorders+") OR ("Communication Disorders+") OR ("Consciousness Disorders") OR ("Coprophagia") OR ("Delirium") OR ("Dementia+") OR ("Depressive Disorder+") OR ("Developmental Disabilities") OR ("Dyslexia, Acquired+") OR ("Factitious Disorders") OR ("Feeding and Eating Disorders of Childhood+") OR ("Impulse Control Disorders") OR ("Mental Disorders Diagnosed in Childhood") OR ("Motor Skills Disorders") OR ("Munchausen Syndrome") OR ("Neurocirculatory Asthenia") OR ("Obsessive-Compulsive Disorder+") OR ("Pica") OR ("Psychotic Disorders+") OR ("Schizophrenia and Disorders with Psychotic Features") OR ("Schizophrenia+") OR ("Stereotypic Movement Disorder") OR ("Stress Disorders, Traumatic+"))
S22	(MH "Rehabilitation Centers")
S21	(MH "mental health")
S20	(MH "Affective Disorders, Psychotic") OR (MH "Agoraphobia") OR (MH "anankastic personality disorder") OR (MH "Anorexia Nervosa") OR (MH "Antisocial Personality Disorder") OR (MH "Anxiety Disorders") OR (MH "Anxiety") OR (MH "Alzheimer

	disease") OR (MH "Attention Deficit and Disruptive Behavior Disorders") OR (MH "Attention Deficit Disorder with Hyperactivity") OR (MH "avoidant personality disorder") OR (MH "Bipolar Disorder") OR (MH "Body Dysmorphic Disorders") OR (MH "Borderline Personality Disorder") OR (MH "Bulimia Nervosa") OR (MH "Bulimia") OR (MH "Catatonia") OR (MH "Child Behavior Disorders") OR (MH "Community Mental Health Services") OR (MH "Compulsive Behavior") OR (MH "Compulsive Personality Disorder") OR (MH "Conduct Disorder") OR (MH "Conversion Disorder") OR (MH "Cyclothymic Disorder") OR (MH "Delirium, Dementia, Amnestic, Cognitive Disorders") OR (MH "Delusions") OR (MH "Dementia+") OR (MH "Dependency (Psychology)") OR (MH "Dependent Personality Disorder") OR (MH "Depersonalization") OR (MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major") OR (MH "Dissociative Disorders") OR (MH "Dysthymic Disorder") OR (MH "Eating Disorders") OR (MH "Feeding Behavior") OR (MH "Hallucinations") OR (MH "histrionic personality disorder") OR (MH "Hysteria") OR (MH "Mental Disorders") OR (MH "Mental health services") OR (MH "Mental illness") OR (MH "Mood Disorders") OR (MH "Multiple Personality Disorder") OR (MH "narcissistic personality disorder") OR (MH "Neurasthenia") OR (MH "Neurotic Disorders") OR (MH "Obsessive Behavior") OR (MH "obsessive compulsive personality disorder") OR (MH "Obsessive-Compulsive Disorder") OR (MH "Panic Disorder") OR (MH "Panic") OR (MH "Paranoid Disorders") OR (MH "Paranoid Personality Disorder") OR (MH "passive-aggressive personality disorder") OR (MH "Personality Disorders") OR (MH "Phobic Disorders") OR (MH "Psychiatry+")OR (MH "Psychophysiologic Disorders") OR (MH "Psychotic Disorders") OR (MH "Rett Syndrome") OR (MH "Schizoid Personality Disorder") OR (MH "Schizophrenia") OR (MH "Schizophrenia, Catatonic") OR (MH "Schizophrenia, Childhood") OR (MH "Schizophrenia, Disorganized") OR (MH "Schizophrenia, Paranoid") OR (MH "Schizotypal Personality Disorder") OR (MH "Shared Paranoid Disorder") OR (MH "Social Behavior Disorders") OR (MH "Somatoform Disorders") OR (MH "Stress Disorders, Post-Traumatic")
S19	(MH "Psychiatric Department, Hospital") OR (MH "Hospitals, Psychiatric") OR (MH "Psychiatric Nursing")
S18	(MH "Mentally Ill Persons")
S17	(MH "Mental Health Services") OR (MH "Community Mental Health Services") OR (MH "Emergency Services, Psychiatric") OR (MH "Social Work, Psychiatric")
S16	S1 or S2 or S3 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15
S15	TI ((fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) N2 (smok* OR tobacco OR cigarette#))
S14	AB ((fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) N2 (smok* OR tobacco OR cigarette#))
S13	TI ("Controlled smoking") OR AB ("Controlled smoking")
S12	(S5 AND S7) OR (S6 AND S4)
S11	AB (temporary abstinence OR (temporar* N1 abstain*))
S10	TI (temporary abstinence OR (temporar* N1 abstain*))
S9	AB ((tobacco N1 control) OR (smoking N1 control) OR (smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))
S8	TI ((tobacco N1 control) OR (smoking N1 control) OR (smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))
S7	AB (fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit* OR reduc* OR abstain* OR prevent* OR

	abstinence OR restrict*)
S6	TI (fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*)
S5	AB ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)
S4	TI ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)
S3	(MH "Smoking/PC")
S2	(MH "Smoking Cessation")
S1	(MH "Tobacco Use Cessation+")

PsycINFO

Database host: EBSCO host
Database coverage dates: 1887-current
Search date: 31 January 2011
Results: 2077

#	Query
S26	**S15 AND S25 (2077 records)** Limiters - Publication Year from: 1985-2012; Population Group: Human
S25	S16 or S17 or S18 or S19 or S20 or S21 or S22 or S23 or S24
S24	DE "Acrophobia" OR DE "Acute Psychosis" OR DE "Acute Stress Disorder" OR DE "Adjustment Disorders" OR DE "Adolescent Psychiatry" OR DE "Affective Disorders" OR DE "Affective Psychosis" OR DE "Agoraphobia" OR DE "AIDS Dementia Complex" OR DE "Alcoholic Hallucinosis" OR DE "Alcoholic Psychosis" OR DE "Alexithymia" OR DE "Alzheimer's Disease" OR DE "Amnesia" OR DE "Anencephaly" OR DE "Anorexia Nervosa" OR DE "Anterograde Amnesia" OR DE "Antisocial Personality Disorder" OR DE "Anxiety Disorders" OR DE "Anxiety" OR DE "Aphasia" OR DE "Aspergers Syndrome" OR DE "Athetosis" OR DE "Attempted Suicide" OR DE "Attention Deficit Disorder with Hyperactivity" OR DE "Attention Deficit Disorder" OR DE "Auditory Hallucinations" OR DE "Autism" OR DE "Autistic Thinking" OR DE "Avoidant Personality Disorder" OR DE "Balint's Syndrome" OR DE "Behavior Disorders" OR DE "Binge Eating Disorder" OR DE "Biological Psychiatry" OR DE "Bipolar Disorder" OR DE "Bipolar Disorder" OR DE "Body Dysmorphic Disorder" OR DE "Body Image Disturbances" OR DE "Borderline Personality Disorder" OR DE "Borderline States" OR DE "Brain Damage" OR DE "Brain Disorders" OR DE "Brain Neoplasms" OR DE "Bufotenine" OR DE "Bulimia" OR DE "Capgras Syndrome" OR DE "Castration Anxiety" OR DE "Catatonia" OR DE "Catatonic Schizophrenia" OR DE "Cerebral Palsy" OR DE "Cerebrovascular Accidents" OR DE "Child Psychiatry" OR DE "Childhood Neurosis" OR DE "Childhood Psychosis" OR DE "Chronic Alcoholic Intoxication" OR DE "Chronic Mental Illness" OR DE "Chronic Psychosis" OR DE "Claustrophobia" OR DE "Clinical Psychologists" OR DE "Cognitive Impairment" OR DE "Commitment (Psychiatric)" OR DE "Community Mental Health Centers" OR DE "Community Mental Health Services" OR DE "Community Mental Health" OR DE "Community Psychiatry" OR DE "Conduct Disorder" OR DE "Confabulation" OR DE "Consciousness Disturbances" OR DE "Consultation Liaison Psychiatry" OR DE "Conversion Disorder" OR DE "Coprophagia" OR DE "Crisis Intervention Services" OR DE "Cyclothymic Personality" OR DE "Death Anxiety" OR DE "Deinstitutionalization" OR DE "Delirium Tremens" OR DE "Delirium" OR DE "Delusions" OR DE "Dementia with Lewy Bodies" OR DE "Dementia" OR DE "Dependent Personality Disorder" OR DE "Depersonalization" OR DE "Developmental Disabilities" OR DE "Diaschisis" OR DE "Dissociation" OR DE "Dissociative Disorders" OR DE "Dissociative Identity Disorder" OR DE "Dysexecutive Syndrome" OR DE "Dyspraxia" OR DE "Dysthymic Disorder" OR DE "Eating Disorders" OR DE "Elective Mutism" OR DE "Encephalitis" OR DE "Encephalopathies" OR DE "Epilepsy" OR DE "Epileptic Seizures" OR DE "Experimental Neurosis" OR DE "Experimental Psychosis" OR DE "Factitious Disorders" OR DE "Fantasies (Thought Disturbances)" OR DE "Folie A Deux" OR DE "Forensic Psychiatry" OR DE "Fragmentation (Schizophrenia)" OR DE "Fugue Reaction" OR DE "General Paresis" OR DE "Generalized Anxiety Disorder" OR DE

	"Geriatric Psychiatry" OR DE "Global Amnesia" OR DE "Hallucinations" OR DE "Hallucinosis" OR DE "Histrionic Personality Disorder" OR DE "Hydrocephalus" OR DE "Hyperkinesis" OR DE "Hyperphagia" OR DE "Hypnagogic Hallucinations" OR DE "Hypochondriasis" OR DE "Hypomania" OR DE "Hysteria" OR DE "Hysteria" OR DE "Hysterical Paralysis" OR DE "Hysterical Vision Disturbances" OR DE "Impulse Control Disorders" OR DE "Institutional Release" OR DE "Intracranial Abscesses" OR DE "Judgment Disturbances" OR DE "Kleine Levin Syndrome" OR DE "Kluver Bucy Syndrome" OR DE "Koro" OR DE "Korsakoffs Psychosis" OR DE "Leukoencephalopathy" OR DE "Lysergic Acid Diethylamide" OR DE "Magical Thinking" OR DE "Major Depression" OR DE "Mania" OR DE "Memory Disorders" OR DE "Mental Disorders" OR DE "Mental Health Personnel" OR DE "Mental Health Programs" OR DE "Mental Health Services" OR DE "Mental Health" OR DE "Microcephaly" OR DE "Munchausen Syndrome" OR DE "Narcissistic Personality Disorder" OR DE "Neurasthenia" OR DE "Neurodermatitis" OR DE "Neuropsychiatry" OR DE "Neurosis" OR DE "Obsessions" OR DE "Obsessive Compulsive Disorder" OR DE "Obsessive Compulsive Personality Disorder" OR DE "Occupational Neurosis" OR DE "Ophidiophobia" OR DE "Organic Brain Syndromes" OR DE "Orthopsychiatry" OR DE "Outpatient Commitment" OR DE "Panic Disorder" OR DE "Panic" OR DE "Paranoia (Psychosis)" OR DE "Paranoia" OR DE "Paranoid Personality Disorder" OR DE "Paranoid Schizophrenia" OR DE "Passive Aggressive Personality Disorder" OR DE "Personality Disorders" OR DE "Pervasive Developmental Disorders" OR DE "Phantom Limbs" OR DE "Phobias" OR DE "Pica" OR DE "Postpartum Psychosis" OR DE "Posttraumatic Stress Disorder" OR DE "Presenile Dementia" OR DE "Pseudocyesis" OR DE "Pseudodementia" OR DE "Psychiatric Aides" OR DE "Psychiatric Clinics" OR DE "Psychiatric Hospital Admission" OR DE "Psychiatric Hospital Discharge" OR DE "Psychiatric Hospital Programs" OR DE "Psychiatric Hospital Readmission" OR DE "Psychiatric Hospital Staff" OR DE "Psychiatric Hospitalization" OR DE "Psychiatric Hospitals" OR DE "Psychiatric Nurses" OR DE "Psychiatric Patients" OR DE "Psychiatric Social Workers" OR DE "Psychiatric Symptoms" OR DE "Psychiatrists" OR DE "Psychiatry" OR DE "Psychological Stress" OR DE "Psychosis" OR DE "Psychosocial Rehabilitation" OR DE "Purging (Eating Disorders)" OR DE "Reactive Psychosis" OR DE "Retrograde Amnesia" OR DE "Rett Syndrome" OR DE "Rett Syndrome" OR DE "Schizoaffective Disorder" OR DE "Schizoid Personality Disorder" OR DE "Schizophrenia" OR DE "Schizophrenogenic Family" OR DE "Schizotypal Personality Disorder" OR DE "School Phobia" OR DE "Seasonal Affective Disorder" OR DE "Self Mutilation" OR DE "Semantic Dementia" OR DE "Senile Dementia" OR DE "Senile Psychosis" OR DE "Separation Anxiety" OR DE "Social Phobia" OR DE "Social Psychiatry" OR DE "Somatization Disorder" OR DE "Somatization" OR DE "Somatoform Disorders" OR DE "Somatoform Pain Disorder" OR DE "Suicide Prevention Centers" OR DE "Tay Sachs Disease" OR DE "Thought Disturbances" OR DE "Toxic Psychoses" OR DE "Transcultural Psychiatry" OR DE "Traumatic Neurosis" OR DE "Vascular Dementia" OR DE "Wernicke's Syndrome"
S23	AB ("mental health" OR "mental healthcare")
S22	TI ("mental health" OR "mental healthcare")
S21	AB (amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood W2 disorder#) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance W1 disorder#) OR (possession W1 disorder#) OR obsessional OR "severe stress" OR (adjustment W1 disorder#) OR dissociate OR "multiple personality" OR

	neurasthenia OR (psychological W1 disturbance#) OR (psychologically W1 disturbed) OR suicid* OR parasuicid* OR (self W1 harm*) OR (self W1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders")
S20	TI (amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood W2 disorder#) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance W1 disorder#) OR (possession W1 disorder#) OR obsessional OR "severe stress" OR (adjustment W1 disorder#) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological W1 disturbance#) OR (psychologically W1 disturbed) OR suicid* OR parasuicid* OR (self W1 harm*) OR (self W1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders")
S19	AB ("secure unit#" OR "secure hospital#")
S18	TI ("secure unit#" OR "secure hospital#")
S17	AB ("anankastic personalit*" OR "anorexia nervosa" OR "antisocial personalit*" OR "attention deficit disorder#" OR "body dysmorphic" OR "conduct disorder" OR "cyclothymic personalit*" OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems" OR "mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR "affective disorder*" OR "avoidant personalit*" OR "behavio#r disorder*" OR "behavio#r problem*" OR "behavioral disorder#" OR "behavioural disorder#" OR "conversion disorder *" OR "eating behavio#r" OR "eating W1 disorder#" OR "overactive disorder#" OR (personality N3 disorder#) OR agoraphobia OR Alzheimer* OR (anankastic N1 person*) OR (antisocial N1 person*) OR anxiety OR anxious OR (asocial N1 person*) OR Asperger* OR autism OR autistic OR (avoidant N1 person*) OR bipolar* OR "borderline personalit*" OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive N1 person*) OR (conversion W1 disorder*) OR cyclothymia OR delusion* OR (dependent N1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (dissocial N1 person*) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (histrionic N1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic N1 person*) OR neurasthenia OR neurosis OR neurot* OR (obsessive N1 person*) OR oligophreni* OR paranoia OR paranoid OR (passive-aggressive N1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR rett?s OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform)
S16	TI ("anankastic personalit*" OR "anorexia nervosa" OR "antisocial personalit*" OR "attention deficit disorder#" OR "body dysmorphic" OR "conduct disorder" OR "cyclothymic personalit*" OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems" OR "mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR "affective disorder*" OR "avoidant personalit*" OR "behavio#r disorder*" OR "behavio#r

	problem*" OR "behavioral disorder#" OR "behavioural disorder#" OR "conversion disorder *" OR "eating behavio#r" OR "eating W1 disorder#" OR "overactive disorder#" OR (personality N3 disorder#) OR agoraphobia OR Alzheimer* OR (anankastic N1 person*) OR (antisocial N1 person*) OR anxiety OR anxious OR (asocial N1 person*) OR Asperger* OR autism OR autistic OR (avoidant N1 person*) OR bipolar* OR "borderline personalit*" OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive N1 person*) OR (conversion W1 disorder*) OR cyclothymia OR delusion* OR (dependent N1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (dissocial N1 person*) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (histrionic N1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic N1 person*) OR neurasthenia OR neurosis OR neurot* OR (obsessive N1 person*) OR oligophreni* OR paranoia OR paranoid OR (passive-aggressive N1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR rett?s OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform)
S15	S1 or S8 or S9 or S10 or S11 or S12 or S13 or S14
S14	TI ((fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit# OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) N2 (smok* OR tobacco OR cigarette#))
S13	AB ((fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit# OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) N2 (smok* OR tobacco OR cigarette#))
S12	TI ("Controlled smoking") OR AB ("Controlled smoking")
S11	AB ("temporary abstinence" OR (temporar* N1 abstain*))
S10	TI ("temporary abstinence" OR (temporar* N1 abstain*))
S9	AB ((tobacco N1 control) OR (smoking N1 control) OR (smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))
S8	TI ((tobacco N1 control) OR (smoking N1 control) OR (smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))
S7	S3 and S5
S6	S2 and S4
S5	AB (fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quits OR quitt* OR quit OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*)
S4	TI (fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quits OR quitt* OR quit OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*)
S3	AB ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)
S2	TI ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)
S1	DE "Smoking Cessation"

Sociological Abstracts

Database platform: CSA Illumina
Database coverage dates: 1952-current
Date: 31/1/2012
No. of records 191
Date limit 1985-2012

Query: (((TI=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars) OR AB=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)) and(TI=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) OR AB=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*))) or(TI=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti) OR AB=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti)) or(TI=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*) OR AB=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*)) or(TI=("controlled smoking") OR AB=("controlled smoking")) or(TI=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*))) or(AB=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*))) or(DE=("smoking"))) and((TI=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems") OR AB=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")) or(TI=("mentally ill" OR

"obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder$) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)) OR AB=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder$) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic))) or(TI=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*) OR AB=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis

OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*)) or(TI=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare") OR AB=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare")) or(TI=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)) OR AB=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent

WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic))) or(DE=("affective illness" or "anorexia nervosa" or "anxiety" or "attention deficit disorder" or "autism" or "bulimia" or "community mental health" or "community mental health centers" or "comorbidity" or "compulsivity" or "defense mechanisms" or "deinstitutionalization" or "depersonalization" or "depression psychology" or "eating disorders" or "emotionally disturbed" or "hysteria" or "mental health" or "mental health services" or "mental hospitals" or "mental illness" or "mental patients" or "narcissism" or "neurosis" or "neuroticism" or "paranoia" or "personality disorders" or "phobias" or "posttraumatic stress disorder" or "psychiatry" or "psychosis" or "schizophrenia" or "senility" or "sociopathic personality")))

Social Policy and Practice

Database host: OVID
Date searched: 10/2/2012, issue 201201
Number of records: 273

1 (hospital or hospitals).af. (14403)
2 (mental* or Psychiatr* or disorder or disorders or schiz* or Rett or Retts or hysteria or hallucin* or dysthymi* or dissociativ* or depression or depressive or dependency or delusion* or dementia* or cyclothymic or delirium or rehabilitation or affective or psychot* or pyschos* or anorexi* or anankastic* or anxiety or anxious or alzheimer* or "attention deficit" or avoidant or bipolar or dysmorphi* or (borderline adj1 personalit*) or bulimi* or catatoni* or "child behavior" or "child behaviour" or compulsive or pica or munchausen or "impulse control" or asthenia or "stereotypic movement" or dyslexi* or "binge eating" or capgras or "developmental disabilities" or "developmental disability" or "child development" or factitious or somatoform or somatic* or sociopath* or posttraumatic or "post traumatic" or phobic or phobia* or "passive aggressive" or paranoid or paranoia or oligophreni* or obsessive or antisocial).af. (89985)
3 ("folie a deux" or panic or avoidant or "behavior problem*" or "behaviour problem*" or asperger* or autism or autistic or compulsion* or dereali?ation or depersonali?ation or disintegrative or dissocial or dissociat* or fugue or hebephreni* or histrionic or hyperkinetic or hypomania or mania* or manic* or narcissis* or neurasthenia or neurosis or neurot* or oligophreni*).af. (9412)
4 "secure unit* ".af. (718)
5 (amensi* or hypomania or cyclomania or dysthymia or asthenic or "emotionally labile" or trance or postencephalitic or postconcussion or possession or obsessional or adjustment or dissociate or "multiple personal*" or (pyschological* adj disturb*) or suicid* or parasuicid* or "self harm*" or "self injur*" or comorbid* or neuros* or OCD or "pyschological stress" or "psychological distress" or adjustment).af. (8779)
6 1 or 2 or 3 or 4 or 5 (104831)
7 (fading or temporary or "give up" or "gives up" or "given up" or "giving up" or cessat* or withdraw* or ceas* or stop* or schedul* or quit* or reduc* or abstain* or prevent* or abstinence or restrict*).ab,de,ti. (47600)
8 ("controlled smoking" or "tobacco control" or "smoking control" or (smoking adj3 service*) or "anti smoking" or "anti tobacco" or "temporary abstinence" or (temporar* adj abstain*)).ab,de,ti. (179)
9 "cigar*".ab,de,ti. (333)
10 smoking.ab,de,ti. (2436)
11 tobacco.ab,de,ti. (790)
12 9 or 10 or 11 (2698)
13 7 and 12 (970)
14 8 or 13 (1038)
15 6 and 14 (275)
16 ((mental adj health*) or mentally or (mental* adj ill*) or (mental adj problem*) or (mental adj disorder*) or Psychiatr* or disorder or disorders or schiz* or Rett or Retts or hysteria or hallucin* or dysthymi* or dissociativ* or depression or depressive or dependency or delusion* or dementia* or cyclothymic or delirium or rehabilitation or affective or psychot* or pyschos* or anorexi* or anankastic* or anxiety or anxious or alzheimer* or "attention deficit" or avoidant or bipolar or dysmorphi* or (borderline adj1 personalit*) or bulimi* or catatoni* or "child behavior" or "child behaviour" or compulsive or pica or munchausen or "impulse control" or asthenia or "stereotypic movement" or dyslexi* or "binge eating" or capgras or "developmental disabilities" or

"developmental disability" or "child development" or factitious or somatoform or somatic* or sociopath* or posttraumatic or "post traumatic" or phobic or phobia* or "passive aggressive" or paranoid or paranoia or oligophreni* or obsessive or antisocial).af,ab,ti. (86975)
17 1 or 3 or 4 or 5 or 16 (102186)
18 14 and 17 (273)

Social Science Citation Index and Conference Proceedings Citation Index, (science, and social science and humanities)

Database platform: Web of Science
Date searched 31 January 2012
Records: 3614
Search strategy:
Timespan=1985-2012
Lemmatization=Off

15 #14 AND #5

14 #13 OR #10 OR #9 OR #8 OR #7 OR #6

13 #12 AND #11

12 TS=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)

11 TS=((fading OR temporary OR (give* NEAR/1 up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit$ OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*))

10 TS=((fading NEAR/2 tobacco) OR (temporary NEAR/2 tobacco) OR ("giving up" NEAR/2 tobacco) OR (cessat* NEAR/2 tobacco) OR (withdraw* NEAR/2 tobacco) OR (ceas* NEAR/2 tobacco) OR (stop* NEAR/2 tobacco) OR (schedul* NEAR/2 tobacco) OR (quit NEAR/2 tobacco) OR (quits NEAR/2 tobacco) OR (quitt* NEAR/2 tobacco) OR (reduc* NEAR/2 tobacco) OR (abstain* NEAR/2 tobacco) OR (prevent* NEAR/2 tobacco) OR (abstinence NEAR/2 tobacco) OR (restrict* NEAR/2 tobacco)) OR TS=((("give* up") NEAR/2 tobacco))

9 TS=((fading NEAR/2 cigarette$) OR (temporary NEAR/2 cigarette$) OR ("giving up" NEAR/2 cigarette$) OR (cessat* NEAR/2 cigarette$) OR (withdraw* NEAR/2 cigarette$) OR (ceas* NEAR/2 cigarette$) OR (stop* NEAR/2 cigarette$) OR (schedul* NEAR/2 cigarette$) OR (quit NEAR/2 cigarette$) OR (quits NEAR/2 cigarette$) OR (quitt* NEAR/2 cigarette$) OR (reduc* NEAR/2 cigarette$) OR (abstain* NEAR/2 cigarette$) OR (prevent* NEAR/2 cigarette$) OR (abstinence NEAR/2 cigarette$) OR (restrict* NEAR/2 cigarette$)) OR TS=((("give* up") NEAR/2 cigarette$))

8 TS=(("give* up") NEAR/2 smok*)

7 TS=((fading NEAR/2 smok*) OR (temporary NEAR/2 smok*) OR ("giving up" NEAR/2 smok*) OR (cessat* NEAR/2 smok*) OR (withdraw* NEAR/2 smok*) OR (ceas* NEAR/2 smok*) OR (stop* NEAR/2 smok*) OR (schedul* NEAR/2 smok*) OR (quit NEAR/2 smok*) OR (quits NEAR/2 smok*) OR (quitt* NEAR/2 smok*) OR (reduc* NEAR/2 smok*) OR (abstain* NEAR/2 smok*) OR (prevent* NEAR/2 smok*) OR (abstinence NEAR/2 smok*) OR (restrict* NEAR/2 smok*))

6 TS=("temporary abstinence" OR (temporar* NEAR/1 abstain*) OR (abstain* NEAR/1 temporar*) OR (controlled NEAR/1 smoking))

5 1,293,776 #4 OR #3 OR #2 OR #1

4 TS=((self NEAR/1 harm*) OR (self NEAR/1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder$" OR "mental health" OR "mental healthcare")

3 TS=((histrionic NEAR/1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic NEAR/1 person*) OR (person* NEAR/1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* NEAR/1 obsessive) OR (obsessive NEAR/1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* NEAR/1 passive-aggressive) OR (passive-aggressive NEAR/1 person*) OR phobia$ OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR (rett NEAR/2 s) OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure NEAR/1 unit$) OR (secure NEAR/1 hospital$) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood NEAR/2 disorder$) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance NEAR/1 disorder$) OR (possession NEAR/1 disorder$) OR obsessional OR "severe stress" OR (adjustment NEAR/1 disorder$) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological NEAR/1 disturbance$) OR (psychologically NEAR/1 disturbed) OR suicid* OR parasuicid*)

2 TS=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective NEAR/1 disorder$) OR (avoidant NEAR/1 personalit*) OR (behavio* problem$) OR (behavio* NEAR/1 disorder$) OR (conversion NEAR/1 disorder$) OR (eating NEAR/1 behavio*) OR (eating NEAR/1 disorder$) OR (overactive NEAR/1 disorder$) OR (personality NEAR/3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic NEAR/1 person*) OR (antisocial NEAR/1 person*) OR anxiety OR anxious OR (person* NEAR/1 asocial) OR Asperger* OR autism OR autistic OR (person* NEAR/1 avoidant) OR bipolar* OR (borderline NEAR/1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive NEAR/1 person*) OR (conversion NEAR/1 disorder$) OR cyclothymia OR delusion* OR (dependent NEAR/1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* NEAR/1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* NEAR/1 histrionic))

1 TS=((anankastic NEAR/1 personalit*) OR "anorexia nervosa" OR (antisocial NEAR/1 personalit*) OR ("attention deficit" NEAR/1 disorder$) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic NEAR/1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")

UK Clinical Research Network Portfolio database

Search date: 17/2/2012
Number of records: 3

Search:
All topic areas,
Title/ research summary: smoke, smoking, tobacco, smoke-free, smokefree (one of the words)

APPENDIX 1B. WEBSITES SEARCH SUMMARY

	Websites searched	Results
1.	Smoke free http://smokefree.nhs.uk	0
2.	NHS Centre for Smoking Cessation and Training http://www.ncsct.co.uk/	4
3.	Action on Smoking and Health (ASH) http://www.ash.org.uk	5
4.	Treat tobacco.net http://www.treatobacco.net/en/index.php	0
5.	Society for Research on Nicotine and Tobacco http://www.srnt.org	0
6.	International Union against Cancer http://www.uicc.org	0
7.	WHO Tobacco Free Initiative (TIF) http://www.who.int/tobacco/en	0
8.	International Tobacco Control Policy Evaluation Project http://www.itcproject.org	0
9.	Tobacco Harm Reduction http://www.tobaccoharmreduction.org/index.htm	0
10.	Current controlled trials www.controlled-trials.com	0
11.	Association for the treatment of tobacco use and dependence (ATTUD) www.attud.org	0
12.	National Institute on drug abuse- the science of drug abuse and addiction http://www.nida.nih.gov/nidahome.html	1
13.	NICE	0
14.	Public health observatories	1
15.	Scottish Government	1
16.	Welsh Assembly Government	0
17.	NHS Evidence	15
18.	Joseph Rowntree Foundation	0
19.	UK Centre for Tobacco Control Studies	8
Total no of articles found		**35**
Total no. of new articles entered into ER4[a]		**15**

Note. [a] Twenty of the documents found through web searches had already been captured by the electronic search of databases.

APPENDIX 2. INCLUSION DECISION QUESTIONS APPLIED AT TITLE AND ABSTRACT SCREENING STAGE

Criterion	Guidance notes	Decision
1. YEAR: Was the document published during or after 1980?	Include studies published during or after 1980, exclude studies before 1980.	If yes, proceed to 2. If no, use EX1 – NOT YEAR
2. EMPIRICAL RESEARCH: does document report on a piece of research?	This can include primary research, in that data have been collected during that study through interaction with or observation of study participants, or secondary research, such as systematic reviews of the literature. MUST have methodology section. Examples of non-research documents include opinion pieces, commentaries, or legislation	If yes, proceed to 3. If no, use EX2 – NOT EMPIRICAL RESEARCH
3. SMOKING CESSATION: Does the title or abstract refer to smoking cessation interventions/ services?	This includes smoking cessation or temporary abstinence approaches, and any approaches used by, or with, health professionals to increase recording, identification and/or referral to stop smoking services or mental healthcare-based stop-smoking services. We will include any pharmacological, psychological or self-help intervention that aims to assist with smoking cessation or temporary abstinence. Interventions of relevance can include pharmacological interventions, administered alone or in combination with other interventions; psychological interventions, including behavioural support, counselling and advice (with and without a pharmacological intervention); self-help approaches to smoking cessation or temporary abstinence without additional support. Psychological interventions could include concomitant use of pharmacological interventions to assist with cessation prior to the target quit date; however, use of pharmacological interventions needs to be equivalent in the active and comparator groups before and after cessation. Psychological interventions could be offered with the pharmacological intervention; however, the type and intensity of support needs to be comparable between the active and comparator groups. Pharmacological interventions that have not been currently licensed for temporary abstinence will also be eligible for inclusion. We will include any strategies, protocols or systems used by relevant health professionals to help identify smokers, record advice given and refer them to services, alone and share information between different groups of health professionals and across the care pathway.	If yes, proceed to 4. If no, use EX3 – NOT SMOKING CESSATION
4. MENTAL HEALTH: Is the study	This includes assessment, care and treatment for people with severe mental illness in hospitals,	If yes, proceed to 5.

(or a component of it) conducted in a mental health secondary care setting, or does it include patients or workers in mental health services, or family/friends/visitors of mental health patients?	outpatient clinics and the community, as well as intensive services in psychiatric units and secure hospitals. This includes people who use secondary care mental health services (including those who are in the process of being referred to, or have recently been discharged from: child, adolescent, adult and older people's mental health services inpatient, residential and long-term care for severe mental illness in a hospital, psychiatric and specialist unit or secure hospital). This includes those who live in the same household as someone who is using secondary care mental health services, such as partners, parents, other family members and carers. Includes those who visit people in secondary care mental health settings. This includes those who work in secondary care mental health settings, in particular, those who have direct contact with people using the services (also includes support staff, volunteers, those working for agencies or as locums, and staff employed by contractors.)	If no, use EX4 – NOT MENTAL HEALTH
5. RESEARCH DESIGN: Is the study design a comparison (e.g., controlled trials, before-and-after) and/or views or process evaluation (e.g., interviews, surveys)?	The study must be a comparison design or include views/process data on barriers and facilitators. Eligible comparison designs: reviews of reviews, systematic reviews and guidelines (including NICE guidelines), randomised controlled trials, controlled trials, controlled before and after studies, interrupted time series, and uncontrolled before and after studies. Eligible views/process evaluations: This includes trials (controlled and non-controlled), descriptive studies (including questionnaire surveys, and process evaluations), qualitative studies (including, but not restricted to, ethnographies, phenomenologies, and grounded theory studies), discussion papers or reports, and 'views studies' (which are written based on a multiple perspective approach with an emphasis on guidance for health professionals). Single case studies should be excluded.	If yes, proceed to 6. If no, use EX5 – NOT RESEARCH DESIGN
6. EFFECTIVENESS: Does the study evaluate the effectiveness of an intervention?	The study must evaluate the effectiveness of intervention (or interventions) either through a comparison with a control group or comparison across time, or through reviews of the evidence. Specifically: reviews of reviews, systematic reviews and guidelines (including NICE guidelines), randomised controlled trials, controlled trials, controlled before and after studies, interrupted	If yes, use IN1 - EFFECTIVENESS. Then proceed to 6.

	time series, and uncontrolled before and after studies.	If no, proceed to 7.
7. BARRIERS/FACILITATORS: Does the title or abstract include barriers or facilitators (including knowledge, attitudes and beliefs) of using or implementing smoking cessation interventions/ services?	This includes trials (controlled and non-controlled), descriptive studies (including questionnaire surveys, and process evaluations), qualitative studies (including, but not restricted to, ethnographies, phenomenologies, and grounded theory studies), discussion papers or reports, and 'views studies' (which are written based on a multiple perspective approach with an emphasis on guidance for health professionals)	If yes, use IN2 - BARRIERS/FACILITATORS. End of criteria.

APPENDIX 3. CHECKLIST FOR SCREENING OF FULL TEXT ARTICLES AND DATA EXTRACTION FORM

CHECKLIST FOR SCREENING OF FULL TEXT ARTICLES

Criterion	Guidance notes	Decision
Type of Participant	Only participants with a current mental health diagnosis (or at least 70% of the population) which meets diagnostic criteria to be included: schizophrenia, schizotypal and delusional disorders; mood (affective) disorders; neurotic, stress-related and somatoform disorders; Eating disorders; specific personality disorders, mixed and other personality disorders, enduring personality changes; pervasive developmental disorders; hyperkinetic disorder, conduct disorder, mixed disorders of conduct and emotions.	
Interventions	Include alone or in combination, pharmacological and psychological interventions (behavioural support, counselling and advice self-help approaches) to assist smoking cessation or temporary abstinence. If pharmacological intervention is used to assist with cessation prior to the target quit date in a psychological intervention the same pharmacotherapy should be used in the active and comparator groups. When psychological and pharmacological intervention are used together the type and intensity of support needs to be comparable between the active and comparator groups. Unlicensed pharmacological interventions for temporary abstinence will not be included. To include any strategies used by health professionals to identify smokers, record advice and referral to services, and share information between different groups of health professionals and across the care pathway.	
Comparators	To include comparisons of interventions with each other (alone or in combination), placebo or usual care. Self-help interventions will be compared to not using a self-help intervention. Approaches to improve identification, recording of advice and referrals will be compared with usual care.	
Outcome measures	Primary outcomes to include the proportion of participants who made successful quit attempts; changes in mean biochemically validated (exhaled carbon monoxide/saliva cotinine levels) levels of smoking from baseline; and self-reported cigarette consumption. Outcomes within 10 years of the intervention	
Study design	Reviews of reviews, systematic reviews and guidelines (including NICE), randomised controlled trials, and controlled trials. Controlled before and after studies, interrupted time series and uncontrolled before and after studies	

***MARKER – Setting – if unclear.**

DATA EXTRACTION FORM

Reviewer name: Date form completed:

Study Author and Year:

Title:

Study Design

Study Design (see guidance sheet for information)	Systematic review Randomised controlled trial Controlled trial Interrupted time series Controlled before and after study Other design	++ + – NR NA
Is the source population or source area well described? Was the country (e.g. developed or non- developed, type of healthcare system), setting (primary schools, community centres etc.), location (urban, rural), population demographics etc. adequately described?		++ + – NR NA
Is the eligible population or area representative of the source population or area? Was the recruitment of individuals/clusters/areas well-defined (e.g. advertisement, birth register)? Was the eligible population representative of the source? Were important groups under-represented?		++ + – NR NA
Do the selected participants or areas represent the eligible population or area? Was the method of selection of participants from the eligible population well described? What % of selected individuals/clusters agreed to participate? Were there any sources of bias? Were the inclusion/exclusion criteria explicit and appropriate?		++ + – NR NA
Study setting and Country (e.g. inpatient/community/ unknown)		++ + – NR NA
Method/s of recruitment of participants (adverts/doctors referrals/inpatients/unknown).		++ + –

		NR NA
Allocation to intervention (or comparison). How was selection bias minimised? Was allocation to exposure and comparison randomised? Was it truly random (++) or pseudo-randomised (+) (e.g. consecutive admissions)? If not randomised, was significant confounding likely (–) or not (+)? If a cross-over, was order of intervention randomised?	None Participant Cluster Other	++ + – NR NA

Participants

Type/s of mental Illness (Schizophrenia/depression/mood affective disorder) Breakdown of participants (different MH diagnosis. *more than 70% study population to have current MH diagnosis).	

Description of intervention/s

Were interventions (and comparisons) well described and appropriate? Were intervention/s and comparison/s described in sufficient detail (i.e. enough for study to be replicated)? Was comparison/s appropriate (e.g. usual practice rather than no intervention)?	++ + – NR NA
Intervention 1 : (Description of intervention/ Duration of treatment period/ timing- point in the care pathway/Delivery/Providers)	
Intervention 2 – Control : (Description of intervention/ Duration of treatment period/ timing-point in the care pathway/Delivery/Providers)	

Quality

	Method and score	
Was the allocation concealed? Could the person(s) determining allocation of participants/clusters to intervention or comparison groups have influenced the allocation? Adequate allocation concealment (++) would include centralised allocation or computerised allocation systems.	Yes / Unclear / No	++ + – NR NA
Were participants and/or investigators blind to exposure and comparison? Were participants AND investigators – those delivering and/or assessing the intervention kept blind to intervention allocation? (Triple or double blinding score [++]). If lack of blinding is likely to cause important bias, score (–).	Participant Y/ N / unsure Clinician Y/ N / unsure Outcome assessor Y/ N / unsure	++ + – NR NA
Was the exposure to the intervention and comparison adequate? Is reduced exposure to intervention or control related to the intervention (e.g. adverse effects leading to reduced compliance) or fidelity of implementation (e.g. reduced adherence to protocol)? Was lack of exposure sufficient to cause important bias?	Yes / Unclear / No	++ + – NR NA
Was contamination acceptably low? Did any in the comparison group receive the intervention or vice versa? If so, was it sufficient to cause important bias? If a cross-over trial, was there a sufficient wash-out period between interventions?	Yes / Unclear / No	++ + – NR NA
Were other interventions similar in both groups? Did either group receive additional interventions or have services provided in a different manner? Were the groups treated equally by researchers or other professionals? Was this sufficient to cause important bias?	Yes / Unclear / No	++ + – NR NA
Were all participants accounted for at study conclusion? Were those lost-to-follow-up (i.e. dropped or lost	Yes / Unclear / No	++ + – NR

pre-/during/post-intervention) acceptably low (i.e. typically <20%)? Did the proportion dropped differ by group? For example, were drop-outs related to the adverse effects of the intervention?		NA
Did the setting reflect usual UK practice? Did the setting in which the intervention or comparison was delivered differ significantly from usual practice in the UK? For example, did participants receive intervention (or comparison) condition in a hospital rather than a community- based setting?	Yes / Unclear / No	++ + – NR NA
Did the intervention or control comparison reflect usual UK practice? Did the intervention or comparison differ significantly from usual practice in the UK? For example, did participants receive intervention or comparison delivered by specialists rather than ward staff?	Yes / Unclear / No	++ + – NR NA
Were outcome measures reliable? Were outcome measures subjective or objective (e.g. biochemically validated nicotine levels [++] vs self-reported smoking [–]).How reliable were outcome measures (e.g. inter-or intra-rater reliability scores)? Was there any indication that measures had been validated (e.g. validated against a gold standard measure or assessed for content validity)?	Yes / Unclear / No	++ + – NR NA
Were all outcome measurements complete? Were all/most study participants who met the defined study outcome definitions likely to have been identified?	Yes / Unclear / No	++ + – NR NA
Were all important outcomes assessed? Were all important benefits and harms assessed? Was it possible to determine the overall balance of benefits and harms of the intervention versus comparison?	Yes / Unclear / No	++ + – NR NA
Were outcomes relevant? Where surrogate outcome measures were used, did they measure what they set out to measure?	Yes / Unclear / No	++ + – NR NA
Were there similar follow-up times in intervention and comparison groups? Were analyses adjusted for difference in length of follow-up	Yes / Unclear / No	++ + – NR NA

(e.g. using person-years)?		
Was the follow-up time meaningful? Was it long enough to assess long term harms and benefits, without being too long to have lost to follow-up issues?	Yes / Unclear / No	++ + – NR NA
Free of selective reporting bias Are reports of study free of suggestions of selective reporting bias?	Yes / Unclear / No	++ + – NR NA
Free of other bias Was the study apparently free of other problems that could put it at high risk of bias?	Yes / Unclear / No	++ + – NR NA

Results
Description of the study population

	Intervention 1	Intervention 2	Total
Number of participants randomised (before drop outs and lost to follow up)			
Final number of participants evaluable			
Age (mean, SD, range):			
Sex (n, % male):			

Were intervention and comparison groups similar at baseline? If not, were these adjusted using multivariate analyses? Were there likely to be any residual differences of relevance?	Yes / Unclear / No	++ + – NR NA
Was Intention to treat (ITT) analysis conducted? Were all participants (including those that dropped out or did not fully complete the intervention course) analysed in the groups (i.e. intervention or comparison) to which they were originally allocated?	Yes / Unclear / No	++ + – NR NA
Was the study sufficiently powered to detect an intervention effect (if one exists)? A power of 0.8 (i.e. it is likely to see an effect of a given size if one exists, 80% of the time) is the conventionally accepted standard. Is a power calculation presented? If not, what is the expected effect size? Is the sample size adequate?	Yes / Unclear / No	++ + – NR NA
Were the estimates of effect size given or calculable? Were effect estimates (e.g. relative risks, absolute risks) given or possible to calculate?	Yes / Unclear / No	++ + – NR NA
Were the analytical methods appropriate? Were important differences in follow-up time and likely confounders adjusted for? If a cluster design, were analyses of sample size (and power), and effect size performed on clusters (and not individuals)? Were subgroup analyses pre-specified?	Yes / Unclear / No	++ + – NR NA
Was the precision of intervention effects given or calculable? Were they meaningful? Were confidence intervals (CIs) and/or p-values for effect estimates given or possible to calculate? Were CIs wide or were they sufficiently precise to aid decision-making? If precision is lacking, is this because the study is under-powered?	Yes / Unclear / No	++ + – NR NA

Outcomes

Outcome measures:		
Principal outcome measures e.g. quit/abstinence rate a) b)		
Assessing outcome measures (e.g. self-reported/CO validated/saliva cotinine) at what time period (1 week/1 month/6 months). a) b)		
	Intervention 1	**Intervention 2**
Principal outcome a) Result *(Adjusted measure of effect with 95% CI* *Raw numbers* *P value?)*		
Principal outcome b) Result		
	Intervention 1	**intervention 2**
Side effects /adverse events reported: no. patients (no. events)		
Assessment of compliance undertaken: yes / not stated / no method:		

Internal and External Validity Scoring

Are the study results internally valid? How well did the study minimise sources of bias (i.e. adjusting for potential confounders)? Were there significant flaws in the study design?		++ + – NR NA
Are the findings generalisable to the source population (i.e. externally valid)? Are there sufficient details given about the study to determine if the findings are generalisable to the source population? Consider: participants, interventions and comparisons, outcomes, resource and policy implications.		++ + – NR NA

Sponsorship

Study Funding Source	
Possible Conflict of Interests	

Further Comments (to include any links with other papers in R4&R5	

Scoring from NICE guidelines

Checklist items are worded so that one of five responses is possible:

++ Indicates that for that particular aspect of study design, the study has been designed/conducted in such a way as to minimise the risk of bias.

+ Indicates that either the answer to the checklist question is not clear from the way the study is reported, or that the study may not have addressed all potential sources of bias for that particular aspect of study design.

– Should be reserved for those aspects of the study design in which significant sources of bias may persist.

Not reported (nr) should be reserved for those aspects in which the study under review fails to report how they have/might have been considered.

Not applicable (na) Should be reserved for those study design aspects which are not applicable given the study design under review (for example, allocation concealment would not be applicable for case–control studies).

Internal and External Validity Scoring

In addition, the reviewer is requested to complete in detail the comments section of the quality appraisal form so that the grade awarded for each study aspect is as transparent as possible. Each study is then awarded an overall study quality grading for internal validity (IV) and a separate one for external validity (EV):

++ All or most of the checklist criteria have been fulfilled, where they have not been fulfilled the conclusions are very unlikely to alter.

+ Some of the checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter.

– Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

APPENDIX 4. REFERENCES TO IDENTIFIED REVIEWS AND THEIR EXCLUDED STUDIES

REFERENCES TO IDENTIFIED REVIEWS

Banham L, Gilbody S (2010) Smoking cessation in severe mental illness: what works? (Structured abstract). *Addiction*. 105(7): 1176-1189.

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Ferron JC, Alterman AI, McHugo GJ, Brunette MF, Drake RE (2009) A review of research on smoking cessation interventions for adults with schizophrenia spectrum disorders (Structured abstract). *Mental Health and Substance Use*. 2(1): 64-79.

Heckman Carolyn J; Egleston Brian L; Hofmann Makary T; (2010) Efficacy of motivational interviewing for smoking cessation: a systematic review and meta-analysis. *Tobacco Control*. 19(5): 410-416.

Hitsman Brian, Borrelli Belinda, McChargue Dennis E; Spring Bonnie, Niaura Raymond (2003) History of depression and smoking cessation outcome: a meta-analysis. *Journal Of Consulting And Clinical Psychology*. 71(4): 657-663.

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REFERENCES TO STUDIES EXCLUDED FROM IDENTIFIED REVIEWS

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APPENDIX 5. SUMMARY OF THE IDENTIFIED REVIEWS

SCHIZOPHRENIA AND SCHIZOAFFECTIVE DISORDERS

Bradshaw 2005 A systematic review was performed following recognised guidelines and searched a selection of electronic databases with additional hand searching. The review included studies which assessed healthy living interventions in adults aged 16+ with schizophrenia or schizoaffective disorder. The primary outcomes assessed were the number of cigarettes smoked per day and abstinence from smoking at the end of treatment and 6 months follow-up. Seven smoking cessation studies were identified in the review (Ziedonis 1997; Addington 1998; George 2000; Evins 2001; Weiner 2001; George 2002; Roll 1998), which assessed the effectiveness of a pharmacotherapy in addition to group therapy. Five of the studies were also included in this review, and therefore are discussed in detail in the relevant sections below. The remaining studies did not fulfill the inclusion criteria and were excluded (Ziedonis 1997; Addington 1998).

Ferron 2009 A review was conducted using a systematic search strategy of two electronic databases and reference list scanning to summarise prospective intervention peer-reviewed studies assessing smoking cessation or smoking reduction in people with schizophrenia spectrum disorders, which were not funded by a tobacco company. Thirteen studies were included in the review, of which nine were deemed eligible for inclusion (Chou 2004; Gallagher 2007; George 2000; Currie 2008; Evins 2001; George 2002; Evins 2005; Evins 2007; George 2008; Weiner 2001), and are therefore discussed in detail in the relevant sections below. The remaining studies did not fulfill the inclusion criteria for this review and were excluded (Breckenridge 1990; Ziedonis 1997; Addington 1998).

Tsio 2010a A systematic review and meta-analysis was performed which searched a selection of electronic databases, conference abstracts, records of trial held by manufacturers, and reference lists of eligible studies to assess the effectiveness of bupropion for smoking cessation and reduction in smoking in schizophrenia (Tsoi 2010a). Seven US based trials were included in the review (Evins 2001; George 2002; Evins 2005; Evins 2007; George 2008; Weiner 2007; Fatemi 2005). Six of the seven studies are included in this review, and these are presented below under the relevant sections. The remaining study did not fulfill the inclusion criteria and was excluded (Weiner 2007).

Tsoi 2010b A systematic review and meta-analysis was performed using recognised guideline which searched a selection of electronic databases, reference lists of eligible studies, and online clinical trials registers, to assess the effectiveness of interventions for smoking cessation and reduction in schizophrenia. Twenty-one trials were included in the review assessing a range of interventions, including pharmacotherapies (bupropion, nicotine replacement therapy, and combinations of bupropion and nicotine replacement therapy), psychological interventions, and combinations of pharmacotherapies and psychological interventions. The 21 included studies were also identified from our searches, and 18 were included in this review, with the studies being presented below under the relevant sections (Baker 2006; Dalack 1999 acute feasbility; Evins 2001; Evins 2005; Evins 2007; Fatemi 2005; Gallagher 2007; George 2000; George 2002; George 2008; Li 2009; Williams 2007; Hartman 1991; de Leon 2005; Kelly 2008; Envoy 1995; Steinberg 2003; Weinberger 2008). Three studies did not fulfill the inclusion criteria for this review and were excluded (Horst 2005; Weiner 2007; Sacco 2009).

El-Guebaly 2002 A critical review was performed which searched for literature using a systematic approach encompassing nine electronic databases. The authors included all study designs in which the research focused on people with diagnoses of specific mental illness or addictive disorders. The studies pertinent to this section of the review assessed smoking cessation approaches in patients with schizophrenia (Breckenbridge 1990; Hartman 1991; George 2000; McEvoy 1995; Addington 1998; McEvoy 1999; George 1995; Weiner 2001). Five of these studies were included in the review, with the studies being presented under the relevant sections. The remaining studies did not fulfill the inclusion criteria for this review and were excluded (Addington 1998; Brekenbridge 1990; George 1995).

Kisely 2008 A critical review was performed which provided an update in the area of smoking cessation interventions of studies published between 2002 and 2007. Thirteen studies were included in the review, of which four focused on individuals with schizophrenia (Evins 2004; Evins 2005; Evins 2007; George 2002). Three of the studies were included in the review, with studies being presented under the relevant sections. The remaining study was excluded as it did not fulfill the inclusion criteria of this review (Evins 2004).

DEPRESSIVE AND MOOD DISORDERS

El-Guebaly 2002 A critical review was performed which searched for literature using a systematic approach encompassing nine electronic databases. The authors included all study designs in which the research focused on people with diagnoses of specific mental illness or addictive disorders. The studies pertinent to this section of the review assessed smoking cessation approaches in patients with depression (Hall 1994; Hall 1996; Kinnunen 1996; Ginsberg 1997; Hall 1998; Patten 1998; Hayford 1999; Brown 2001). However, none of the studies were included in the review, either because they assessed past history of depression (Hall 1994; Hall 1996; Brown 2001; Hall 1998; Ginsberg 1997; Hayford 1999; Patten 1996) or <70% of the study population were diagnosed with an eligible mental health disorder (Kinnunen 1996).

Hitsman 2003 A meta-analysis was performed which included studies identified from only two electronic databases, with some hand searching of journals and contacting of authors known within the smoking cessation field, to identify studies assessing the association between smoking cessation and depression. Fifteen studies were included in the meta-analysis (Glassman 1988; Covey 1993; Glassman 1993; Hall 1994; Ginsberg 1995; Hall 1996; Muñoz 1997; Breslau 1998; Hall 1998; Prochazka 1998; Covey 1999; Hayford 1999; Niaura 1999; Killen 2000; Keuthen 2000). However, all of these studies either a past history of depression or <70% of the study population were diagnosed with an eligible mental health disorder, thus none of the studies fulfilled the inclusion criteria for this review and were therefore excluded.

Kisely 2008 A critical review was performed which provided an update in the area of smoking cessation interventions of studies published between 2002 and 2007. Thirteen studies were included in the review, of which three focused on individuals with a past history of depression (Hall 2002; Saules 2004; Swan 2003), thus none of the studies fulfilled the inclusion criteria for this review and were excluded.

ALL NON-ORGANIC PSYCHIATRIC DISORDERS AND OTHER DISORDERS

Banham 2010 A systematic review and meta-analysis was performed to assess the effectiveness of pharmacological and/or psychological interventions on smoking cessation in severe mental illness. Eight RCTs were included in the review (George 2000; Baker 2006; Dalack 1999 acute feasbility; Evins 2001; Evins 2005; George 2002; Evins 2007; George 2008). All of these studies were included in this review, with the studies being presented under the relevant sections.

Heckman 2010 A systematic review and meta-analysis was performed to assess the effectiveness of motivational interviewing in participants with physical or mental illness. Three studies were included in the review which looked at the treatment in mental health populations (Baker 2006; Brown 2003; George 2000). All of these studies were identified from our searches and included in this review, with the studies being presented under the relevant sections.

Bryant 2011 A systematic review and meta-analysis was performed to assess the effectiveness of behavioural interventions in selected disadvantaged groups. Ten papers included in the review focused on participants with psychiatric disorders (Baker 2006; Brown 2001; Dixon 2009; Gallagher 2007; Guliver 2008; Hall 2006; MacPherson 2010; McFall 2005; Vickers 2009; Williams 2010). All of these studies were identified from our searches and five of the studies were included in this review, with the studies being presented under the relevant section. Five studies did not fulfill the inclusion criteria for this review and were excluded (Brown 2001; Guliver 2008; Hall 2006; MacPherson 2010; Vickers 2009).

Kisely 2008 A critical review was performed which provided an update in the area of smoking cessation interventions of studies published between 2002 and 2007. Thirteen studies were included in the review, of which one focused on psychiatric disorder (Kisely 2003) and one on PTSD (McFall 2005). Both of these studies were identified from our searches and were included in the review, with the studies being presented under the relevant sections.

APPENDIX 6. REFERENCES TO INCLUDED STUDIES

Akbarpour F, Rezaei O, Khodaie-Ardakani MR, Sheikhvatan M, Goodarzi H, Dolatshahi B (2010) A double-blind placebo-controlled trial of bupropion for smoking abstinence and cognition improvement in schizophrenia. *Minerva Psichiatrica*. 51(4): 263-269.

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APPENDIX 7. EVIDENCE TABLE FOR INCLUDED STUDIES

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Akbarpour **Year:** 2010 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** +	**Source population:** Tehran, Iran **Eligible population:** Razi psychiatric Teaching Hospital, University of Social Welfare and Rehabilitation Sciences **Selected population:** Male smoking in-patients with schizophrenia. DSM-IV-TR criteria used **Excluded population:** Contraindications to bupropion, serious co-morbid psychiatric illnesses, recent history of alcohol use in previous 3 months, history of allergic response to bupropion **Setting:** In-patients	**Method of allocation:** Not clear **Intervention description:** bupropion, 150mg for 3 days, increasing to 300mg per day for 8 weeks **Control description:** placebo for 8 weeks **Sample sizes:** 32 **Intervention n=** 16 **Control n=** 16 **Baseline comparisons:** No differences noted **Study sufficiently powered?** Unclear	**Primary outcomes:** Self-reported smoking cessation **Secondary outcomes:** Number of cigarettes smoked per day **Follow-up periods:** 8 weeks **Method of analysis:** Multivariable linear and logistic regression	**Primary outcomes:** Multivariate analysis found bupropion was significantly related to smoking cessation (p=0.03) **Secondary outcomes:** A significant reduction in the number of cigarettes smoker per day from baseline to week 8 in the bupropion group (mean 15.0 versus 11.1; p=0.008), but no significant reduction in the placebo group (mean 13.1 versus 13.4; p=0.72). **Attrition details:** No drop-outs reported	**Limitations identified by author:** None reported **Limitations identified by team:** unclear methods used for randomization, unclear ITT analysis, small sample size, short follow-up, no bio-verification of abstinence **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Axtmayer **Year:** 2011 **Study design:** Randomised controlled trial **Quality score:** - **External validity:** -	**Source population:** USA, multi-site study **Eligible population:** Veterans Affairs Smoking cessation coordination programme, mental health providers referred participants **Selected population:** Smokers with mental illness **Excluded population:** Not reported **Setting:** Outpatients	**Method of allocation:** Unclear **Intervention description:** Telephone care coordination programme with counselling from a State Quitline **Control description:** Face-to-face counselling from a Veterans Affairs counsellor **Sample sizes:** 128 **Intervention n=** Unclear **Control n=** Unclear **Baseline comparisons:** Unclear **Study sufficiently powered?** No, stated required sample size of 1500 participants	**Primary outcomes:** Number of cigarettes smoked per day **Secondary outcomes:** N/A **Follow-up periods:** Two months post enrollment **Method of analysis:** Unclear	**Primary outcomes:** A significant reduction in the number of cigarettes smoked from baseline to follow-up for participants who received at least one counselling session in both the State Quitline (mean 16.1 versus 9.3 cigarettes/day; p<0.0009) and Veteran Affairs counsellor (mean 17.9 versus 11.1 cigarettes/day; p=0.001) groups. No comparisons were made between treatment groups. **Secondary outcomes:** N/A **Attrition details:** No drop-outs reported	**Limitations identified by author:** Not reported **Limitations identified by team:** Insufficient details given in abstract, small sample size, criteria for mental health disorder not provided, only performed within group comparisons, no bio-verification of smoking status **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Baker **Year:** 2006 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** ++	**Source population:** Sydney and Newcastle region of New South Wales, Australia **Eligible population:** Referrals from community health agencies (82%), in-patients psychiatric units (8%), schizophrenia register (7%), in-patients were contacted two months post-discharge **Selected population:** Smokers with non-acute psychotic disorders, 18+ years, 15+ cigarettes per day, ICD 10 diagnosis of psychotic disorder **Excluded population:** preclude nicotine patches, acutely psychotic, if so re-assessed one month post screening, having acquired cognitive impairment **Setting:** Outpatients	**Method of allocation:** Draw a sealed envelope from a set of envelopes in which there was an initial equal distribution of allocation at each site **Intervention description:** High intensity behavioural: Eight one hour individual sessions of motivational interviewing and CBT plus NRT in addition to treatment as usual and provision of booklets for smoking cessation and for supporters **Control description:** Treatment as usual included access to general practitioner and publicly funded community health teams, received the same booklets and assessment schedules as intervention group **Sample sizes:** 298 **Intervention n=** 147 **Control n=** 151 **Baseline comparisons:** No baseline differences between the groups **Study sufficiently**	**Primary outcomes:** Continuous abstinence (bio-verified by expired CO<10ppm), point prevalence smoking abstinence **Secondary outcomes:** Smoking reduction **Follow-up periods:** 3, 6, and 12 months **Method of analysis:** Repeated measures ANOVA, logistic regression	**Primary outcomes:** No significant difference between the high low intensity behavioural therapy programme with NRT and the low intensity programme on continuous abstinence at three months (OR 2.95, 95% CI 0.83-10.53), 6 months (OR 2.84, 95% CI 0.48-16.67), or 12 months (OR 5.28, 95% CI 0.31-90.20) follow-up. Similar non-significant findings were seen for 7 day point prevalence abstinence (3 months, OR 2.78, 95% CI 0.96-8.07; 6 months, OR 2.54, 95% CI 0.70-9.28; 12 months, OR 1.72, 95% CI 0.58-5.09). **Secondary outcomes:** Participants in the high intensity programme with NRT were significantly more likely to have reduced their smoking by 50% or more relative to baseline at 3 months (OR 3.89, 95% CI 1.9-7.89) and 12 months (OR 2.09, 95% CI 1.03-4.27); but no	**Limitations identified by author:** No control for therapy time **Limitations identified by team:** No further limitations identified **Evidence gaps and/or recommendations for future research:** Further studies needed to evaluate long term NRT use or extended CBT interventions, allowing for resumption of treatment following relapse. Development of more efficacious interventions among smokers with severe mental illness who do not respond to treatments assessed in this study. Studies should address differential benefits associated with type of anti-psychotic medications used. **Source of funding:** National Health and Medical research Council, Rotary, and Community Health and Tuberculosis, Australia. NRT provided free of charge by

		powered? Unclear		significant effect was seen at 6 months follow-up (OR 1.88, 95% CI 0.92-3.82). **Attrition details:** **I**ntention to treat analysis assuming drop outs were smokers	GlaxoSmithKline

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Baker **Year:** 2009 **Study design:** Uncontrolled before and after study **Quality score:** - **External validity:** +	**Source population:** Sydney and Newcastle region of New South Wales and Melbourne, Victoria, Australia **Eligible population:** Referrals from community health agencies, general practitioners, psychiatric rehabilitation services **Selected population:** 18+ years, 15+ cigarettes per day, ICD 10 diagnosis of non-acute psychotic disorder **Excluded population:** Medical conditions preclude NRT, brain injury **Setting:** Outpatients	**Method of allocation:** None **Intervention description:** Nine sessions of treatment programme based on healthy lifestyle intervention with motivational interviewing **Control description:** Pre-treatment programme baseline, no intervention **Sample sizes:** 48 **Intervention n=** 48 **Control n=** 48 **Baseline comparisons:** Within-participant design **Study sufficiently powered?** Not reported	**Primary outcomes:** Continuous abstinence (CO<10ppm), point prevalence abstinence (7 day) **Secondary outcomes:** N/A **Follow-up periods:** mean 19.6 weeks from baseline period **Method of analysis:** Paired t-tests	**Primary outcomes:** Significant reductions in the number of cigarettes smoked per day from baseline to post-treatment assessment (mean 30.8 versus 17.2; p<0.001). 11.6% of the participants were continuously abstinent (bio-verified with expired CO levels), and 18.6% achieved 7 day point prevalence abstinence, from quit date to the post-treatment assessment. **Secondary outcomes:** N/A **Attrition details:** Lost 5 participants, excluded from analysis	**Limitations identified by author:** Absence of control group, no longer term follow-up **Limitations identified by team:** Uncontrolled before and after study, different length of time for before and after phases **Evidence gaps and/or recommendations for future research:** RCT needed to extend the length of intervention given in order to encourage further dietary changes which compares treatment with control group **Source of funding:** Australian Commonwealth Department of Health and Ageing. GlaxoSmithKline provided NRT

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Barnett **Year:** 2008 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** +	**Source population:** California, USA **Eligible population:** Langley Porter Psychiatric Institute and Kaiser Permanente Northern California **Selected population:** Current diagnosis of uni-polar depressions, smoked at least one cigarette per day. Participants did not need to be interested in quitting smoking **Excluded population:** Contraindication to pharmacological treatment, history of bipolar disorder or conditions such as dementia that might interfere with comprehension **Setting:** Outpatients	**Method of allocation:** Unclear **Intervention description:** Stepped care: 3 scheduled assessment of readiness of quit smoking using a computer-mediated evaluation that was reviewed by smoking cessation counsellor. If showed contemplation of quitting or participants wanted treatment, then treatment commences. Six sessions of psychological counselling and up to 10 weeks of NRT with dermal patch. Those who continued to smoke after this treatment were offered bupropion SR and two additional counselling sessions **Control description:** Brief contact: receive printed top-smoking guide and a list of smoking cessation programmes from the smoking study staff **Sample sizes:** 322 **Intervention n=** 163 **Control n=** 159	**Primary outcomes:** Point prevalence abstinence (7 day, bio-verified by CO<10ppm) **Secondary outcomes:** N/A **Follow-up periods:** 18 months **Method of analysis:** Generalized estimating equations	**Primary outcomes:** Participants who received stepped care were more likely to be abstinent from smoking at the end of the 18 months follow-up than those in the brief contact group (24.6% versus 19.1%; p value not reported). **Secondary outcomes:** N/A **Attrition details:** No drop-outs reported	**Limitations identified by author:** None reported **Limitations identified by team:** Insufficient methods about the trial was the paper focuses on cost-effective rather than effectiveness of treatment **Evidence gaps and/or recommendations for future research:** None reported pertaining smoking cessation **Source of funding:** National Institute on Drug Abuse

		Baseline comparisons: Similar at baseline **Study sufficiently powered?** Unclear, but sample size appears adequate			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Bloch **Year:** 2010 **Study design:** Randomised controlled trial **Quality score:** - **External validity:** -	**Source population:** Northern Israel **Eligible population:** Two community mental health centres and two ambulatory clinics, referred by treatment team **Selected population:** DSM-IV-TR criteria for schizophrenia or schizoaffective disorder, clinically stable, stable dose or anti-psychotic drug at least one month prior to start date, stable cigarette habits, expressed strong desire to quit or at least significantly reduce the number of cigarettes smoked **Excluded population:** Not reported **Setting:** Outpatients	**Method of allocation:** Randomly allocated based up on arrival **Intervention description:** Following 2 week stabilisation period, Bupropion SR (150mg/day for 3 days increasing to 300mg/day) and CBT, for 14 weeks **Control description:** placebo and CBT, for 14 weeks **Sample sizes:** 61 **Intervention n=** 45 **Control n=** 16 **Baseline comparisons:** Differences seen in demographics as based only completers only **Study sufficiently powered?** Unclear	**Primary outcomes:** Self-reported cigarette consumption **Secondary outcomes:** N/A **Follow-up periods:** 7 and 14 weeks **Method of analysis:** Generalized linear modeling, but unadjusted statistics only presented	**Primary outcomes:** No significant treatment effect was seen for the self-reported number of cigarettes smoked per day between the bupropion and placebo groups at the end of 14 weeks ($p>0.1$); however, a significant reduction in the number of cigarettes smoked was seen when comparing baseline to week 14 ($p<0.001$). **Secondary outcomes:** N/A **Attrition details:** Large drop-out rate (only evaluated 21 in intervention group and 11 in control group), most drop outs due to lack of motivation	**Limitations identified by author:** Small sample size, self-report outcome **Limitations identified by team:** Completers analysis when high drop-out rate, short follow-up **Evidence gaps and/or recommendations for future research:** Larger sample sizes for smoking cessation trials in schizophrenia, trials in both males and females **Source of funding:** National Alliance for Research on Schizophrenia and Depression, partially supported by Phillip Morris USA and Phillip Morris International

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Brown **Year:** 2003 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** +	**Source population:** Rhode Island, USA **Eligible population:** Private psychiatric hospital, staff approved those admitted to Butler hospital to be approached **Selected population:** 13-17 year olds, reporting smoking at least one cigarette per week for 4 weeks before hospitalisation, access to phone, DSM-IV criteria for anxiety disorder, disruptive and behavioural disorder, substance related disorder **Excluded population:** DSM –IV criteria for current psychotic disorder **Setting:** In-patient	**Method of allocation:** Cluster randomised which was determined randomly before initiation of the study **Intervention description:** Motivational interviewing, two 45 minute individual sessions while hospitalised. Following discharge received NRT patch in those desired to quit, medically eligible, and smoked 10+ cigarettes per day. Allowed 2 NRT patches during 6 months after discharge **Control description:** Brief advice, 5-10 minutes of advice to quit smoking by study therapist. A copy of "I Quit!" self help pamphlet given too. NRT patch regimen allowed once after discharge **Sample sizes:** 191 **Intervention n=** 116 **Control n=** 75 **Baseline comparisons:** Participants did not differ significantly by treatment condition on age, sex, and	**Primary outcomes:** Point prevalence abstinence (7 day bio-verified by CO<10ppm and saliva cotinine <15ng/ml) **Secondary outcomes:** Number of cigarettes smoked per day, self-efficacy **Follow-up periods:** 1, 6, 12 months **Method of analysis:** Generalized estimating equations, chi-squared tests	**Primary outcomes:** The study demonstrated no significant difference between the treatment groups on the number of cigarettes smoked per day at 12 months follow-up (p=0.74). Additionally, 7 day point prevalence (bio-verified with expired CO and saliva cotinine) was not significantly difference at one month (11.0% versus 11.0%), 6 months (13.3% versus 8.5%), or 2 months (14.0% versus 9.9%) follow-up (all p>0.30). Over the 12 month follow-up, no significant difference was seen in the odds of abstinence between the treatment groups (OR 1.16, 95% CI 0.59-2.31; p=0.38); however, the study reported having an anxiety disorder was associated with a higher odds of abstinence (OR 4.71, 95% CI 2.19-10.12; p=0.0001). **Secondary outcomes:** On discharge, participants in	**Limitations identified by author:** high participation refusal rate, caution needed to how generalisable the results are to general population of adolescent smokers **Limitations identified by team:** Level of contact different between groups so difference may be due to this rather than content of treatment, specific to in-patients **Evidence gaps and/or recommendations for future research:** future studies explore allowing for matching in design so those with low motivation to change receive motivational interviewing, and those with high motivation to change receive more directive, skills based approach **Source of funding:** Not reported

		age of first cigarette **Study sufficiently powered?** Unclear		the motivational interviewing group had significantly higher self-efficacy (confidence in ability to refrain from smoking) compared to those receiving brief advice (p=0.04). **Attrition details:** No drop-outs reported	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Chen **Year:** 2002 **Study design:** Interrupted time series with non-equivalent control group (note: from the methods this appears to be a RCT) **Quality score:** - **External validity:** -	**Source population:** Taiwan, China **Eligible population:** One day-care ward in psychiatric hospital, **Selected population:** DSM – IV criteria for schizophrenia or schizoaffective disorder, 20+ cigarettes per day, participants who could stay for at least 60 minutes to participate in study, literate, willing to complete questionnaire **Excluded population:** acute, consciously confused, violent behaviours or tendencies, excluded also if they have not attended half of the allocated sessions **Setting:** Outpatients	**Method of allocation:** Unclear **Intervention description:** Smoking cessation programme – closed and time limited format. 8 sessions twice per week of 1 hour duration per session, for 4 weeks **Control description:** Completed all assessments during the same period but received no treatment **Sample sizes:** 65 **Intervention n=** 23 **Control n=** 42 **Baseline comparisons:** There were no significant differences between the groups **Study sufficiently powered?** States a sample size of 65 is needed for three was of data; however insufficient details given to replicate	**Primary outcomes:** Point prevalence smoking abstinence (7 day) **Secondary outcomes:** N/A **Follow-up periods:** 8 weeks **Method of analysis:** Generalizing estimating equations, chi-squared test, t test	**Primary outcomes:** 8% and 16% 7 day point prevalence quit rates in the smoking cessation programme group at week 4 and week 8. Insufficient details were given regarding the quit rates of the control group. **Secondary outcomes:** N/A **Attrition details:** One drop out in intervention group	**Limitations identified by author:** One psychiatric hospital **Limitations identified by team:** Methods very unclear, no bio-verified smoking abstinence, control group had no intervention, short outcome **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Chou **Year:** 2004 **Study design:** Randomised controlled trial **Quality score:** - **External validity:** +	**Source population:** Taiwan, China **Eligible population:** One day care ward in psychiatric hospital **Selected population:** 18+ years, 15+ cigarettes per day for at least one years, at least 45.4 kg weight **Excluded population:** allergy, hypersensitivity to transdermal adhesives, serious or unstable cardiac, hypertensive, renal, pulmonary, endocrine, neurological disorder, NRT use in past 6 months, current use of any smoking medication, regular use of non-cigarette tobacco product **Setting:** Unclear	**Method of allocation:** Randomised matching on expired CO levels **Intervention description:** NRT patch, 14 mg/day for weeks 1-6, 7mg/day weeks 7-8 **Control description:** No description **Sample sizes:** 68 **Intervention n=** 26 **Control n=** 42 **Baseline comparisons:** No significant differences were found between the groups **Study sufficiently powered?** States a sample size calculation based on GEE model found 68 people with 7 waves of data were sufficient to detect a medium effect size	**Primary outcomes:** Continuous and point prevalence abstinence (bio-verified by CO<10ppm) **Secondary outcomes:** Expired CO levels, self-reported cigarettes per day **Follow-up periods:** 8 weeks **Method of analysis:** Generalized estimating equations, chi-squared	**Primary outcomes:** Point prevalence abstinence (bio-verified by CO<10ppm) were higher in the NRT patch group (26.9%) as compared to placebo (0%) at 3 months follow-up. **Secondary outcomes:** Significantly greater reductions in the NRT patch group from the end of the first week of patch use for expired CO levels ($p<0.0001$) and self-reported number of cigarettes smoked per day ($p<0.001$), and continued being reduced through to 3 months follow-up (CO levels, $p<0.0001$; self-reported number of cigarettes smoked per day, $p<0.0001$) compared to placebo **Attrition details:** No drop-outs reported	**Limitations identified by author:** Almost completely male smoker, small sample size, short follow-up **Limitations identified by team:** Insufficient details regarding population of control group. Control group had no intervention **Evidence gaps and/or recommendations for future research:** Longer follow-up of same intervention in future trials, evaluation of relapse prevention interventions **Source of funding:** NRT provided by Novartis Consumer Health

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Cornelius **Year:** 1997 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** ++	**Source population:** Pittsburgh, USA **Eligible population:** Western Psychiatric Institute and Clinic, psychiatric hospital **Selected population:** Co-morbid depression and alcohol dependence, DSM-III-R, 10+ cigarettes per day **Excluded population:** **B**ipolar, schizoaffective, schizophrenia, hyperthyroidism, hypothyroidism, lover disease, cardiac or renal impairment, mental retardation, received antipsychotic or antidepressant medication in the month before admission, <18 or >65 years of age **Setting:** Inpatient	**Method of allocation:** Randomisation stratified by gender and race **Intervention description:** Fluoxetine, one capsule (20mg) per day, could be increased to 2 capsules per day after 2 weeks if substantial residual depressive symptoms persisted (however, this was rare). Usual care in outpatients clinics of weekly supportive psychotherapy sessions **Control description:** Placebo capsule. Usual care in outpatient clinics of weekly supportive psychotherapy sessions **Sample sizes:** 25 **Intervention n=** 12 **Control n=** 13 **Baseline comparisons:** No differences between groups at baseline **Study sufficiently powered?** Unclear	**Primary outcomes:** self-reported number of cigarettes per day **Secondary outcomes:** N/A **Follow-up periods:** 12 weeks **Method of analysis:** ANOVA adjusting for gender and race	**Primary outcomes:** Self-reported number of cigarettes smoked per day was fewer in the fluoxetine group compared to placebo (mean 16.2 versus 22.3 cigarettes/day) across the 12 weeks; however, the difference when comparing the treatment groups was not statistically significant. **Secondary outcomes:** N/A **Attrition details:** No drop-outs reported	**Limitations identified by author:** Modest sample size, lack of long term follow-up **Limitations identified by team:** Self-reported outcome **Evidence gaps and/or recommendations for future research:** Large, double-blind, placebo-controlled studies with selective serotonin agents in depressed alcoholic smokers **Source of funding:** National Institute on Alcohol Abuse and Alcoholism, National In statute on Drug Abuse, National Institute on Mental Health CRC

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Culhane **Year:** 2008 **Study design:** Two randomised controlled trials **Quality score:** - **External validity:** +	**Source population:** Massachusetts, USA **Eligible population:** Five urban community mental health centres **Selected population:** Adults with schizophrenia or schizoaffective disorder (depressive type), DSM-IV criteria, stable symptoms, stable dose of antipsychotic medication for 30 days, smoked 10+ cigarettes per day, willing to set quit date within 4 weeks of enrollment **Excluded population:** DSM-IV for current major depressive disorder, substance use disorder, taking bupropion or NRT at screening, seizure disorder, history of bulimia, mania, current clozapine >500mg/day without therapeutic dose of an anticonvulsant **Setting:** Outpatients	**Method of allocation:** Unclear **Intervention 1 description:** Bupropion SR (300mg/day) and CBT **Intervention 2 description:** Bupropion SR (300mg/day) and CBT and NRT patch (initiated on quit date) 21 mg/day for 4 weeks, decreasing to 14mg/day for 2 weeks, decreasing to 7 mg/day for 2 weeks). NRT gum (2mg used a required up to 9 pieces per day) **Control description:** Placebo (no further description). Ten further patients were added to the analysis of trial 2 who were not medically eligible to receive bupropion SR , but received open NRT and CBT **Details of CBT:** all participants received 12 sessions of weekly smoking cessation group programme **Sample sizes:** Not reported	**Primary outcomes:** Continuous abstinence (week 9-12, bio-verified by CO<9ppm) **Secondary outcomes:** N/A **Follow-up periods:** 12 weeks **Method of analysis:** Manual stepwise forward selection logistic regression	**Primary outcomes:** The amalgamated findings from the two studies reported no significant differences in continuous abstinence (weeks 9-12) between the treatment groups; however, a re-analysis of the findings found the combination of bupropion and NRT patches were significantly more likely to be abstinent (weeks 9-12) compared to placebo (OR 9.16, 95% CI 1.02-82.2; p=0.04); however, no significant difference in abstinence (week 9-12) was detected for single treatment of bupropion or NRT patches compared to placebo (OR 5.27, 95% CI 0.64-43.2; p=0.16). **Secondary outcomes:** N/A **Attrition details:** Not reported	**Limitations identified by author:** Small sample size, small number achieving continuous abstinence, not generalisable to larger population of outpatients with schizophrenia who are trying to stop smoking, short follow-up **Limitations identified by team:** Methods unclear, influence of extra 10 participants not clear **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** National Heart, Lung, and Blood Institute, Department of Health and Human Substance Abuse and Mental Health Services Administration, National Institute of Mental Health, National Institute on Drug Abuse. Financial disclosures for some authors

		Intervention 1 n= not reported **Intervention 2 n=** not reported **Control n=** not reported **Baseline comparisons:** Not reported **Study sufficiently powered?** Unclear			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Currie **Year:** 2008 **Study design:** Quasi-randomised controlled trial **Quality score:** + **External validity:** +	**Source population:** Calgary, Alberta, Canada **Eligible population:** Community organizations and down-town mental health clinics **Selected population:** Severe and persistent mental illness with an interest in quitting smoking (schizophrenia, mood disorders, other conditions), on one or more psychotic medications including antipsychotics, mood stabilizers, anxiolytics, antidepressants **Excluded population:** Not reported **Setting:** Outpatients	**Method of allocation:** Alternating assignment **Intervention description:** 8 session version of smoking cessation program derived from popular treatment protocol "Freedom from Smoking", particularly tailored for persons with mental illness. NRT patches and gum encouraged **Control description:** 4 session version of smoking cessation program derived from popular treatment protocol "Freedom from Smoking", particularly tailored for persons with mental illness. NRT patches and gum encouraged **Sample sizes:** 85 **Intervention n=** not reported **Control n=** not reported **Baseline comparisons:** No difference were found	**Primary outcomes:** Point prevalence abstinence (7 days, bio-verified with expired CO<10ppm) **Secondary outcomes:** Number of cigarettes per day in non-quitters **Follow-up periods:** 3, 6, and 12 months **Method of analysis:** Not reported	**Primary outcomes:** 7 day point prevalence abstinence, bio-verified by expired CO, were higher in the 8 session version than the 4 session version at all time points (post-treatment, 13% versus 21%; 3 months, 15% versus 24%; 6 months, 8% versus 29%; 12 months, 21% versus 27%; no p values could be determined for the comparisons). Additionally, the study reported post-treatment 7 day point prevalence was higher in males than females (69% versus 31%, p<0.01). **Secondary outcomes:** Not reported by treatment group **Attrition details:** High follow-up rates (3 months: 100% versus 93%, 6 months: 97% versus 88%, 12 months: 97% versus 83%).	**Limitations identified by author:** Non-random assignment, different program lengths, low quit rate **Limitations identified by team:** Lack of continuous abstinence **Evidence gaps and/or recommendations for future research:** Further research in same area **Source of funding:** Alberta Alcohol and Drug Abuse Commission Tobacco Reduction Phase I grant

		Study sufficiently powered? Unclear			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Dalack **Year:** 1999 **Study design:** Non-randomised cross-over trial **Quality score:** - **External validity:** +	**Source population:** USA **Eligible population:** Ann Arbor Veterans Affairs Medical Centre **Selected population:** DSM-III-R criteria for schizophrenia or schizoaffective disorder, moderate to severe nicotine dependence, absence of current non-nicotine substance use disorder, no history of serious medical illness **Excluded population:** Not reported **Setting:** Outpatients	**Method of allocation:** None **Intervention description:** NRT patch, 22mg for 24 hours **Control description:** Placebo patch for 24 hours **Sample sizes:** 10 (within participants) **Intervention n=** 10 **Control n=** 10 **Baseline comparisons:** Within participant design **Study sufficiently powered?** Unclear	**Primary outcomes:** Self-reported number of cigarettes per day **Secondary outcomes:** Expired CO levels **Follow-up periods:** 24 hours **Method of analysis:** Repeated measures ANOVA, paired t-test	**Primary outcomes:** Similar numbers of cigarettes were smoked per day on NRT compared to placebo (mean 25.3 versus 26.1 cigarettes per day). **Secondary outcomes:** Mean expired CO levels decreased by 15% during the active compared to the placebo patch condition, but this was not statistically significant (p=0.14). **Attrition details:** All participant completed the protocol	**Limitations identified by author:** Population not trying to cut down or quit, short follow-up, small sample size **Limitations identified by team:** Not randomised **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Research Advisory Group, Department of Veterans Affairs

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: De Leon **Year:** 2005 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** +	**Source population:** USA **Eligible population:** Large population state hospital psychiatric patients, recruited or referred for clozapine treatment **Selected population:** Severe treatment refractor symptoms that had affected their individual lives for a quarter of a century of more and precipitated numerous psychiatric hospitalisations. DSM-III-R schizophrenia or schizoaffective disorder, not shown satisfactory clinical response to treatment with at least three neuroleptic drugs, had Clinical Global Impression Scale of moderately ill, had Brief Psychiatric Rating Scale total of at least 45 **Excluded population:** Not reported **Setting:** In-patients	**Method of allocation:** Unclear **Intervention 1 description:** 600mg/day clozapine **Intervention 2 description:** 300mg/day clozapine **Control description:** 100mg/day clozapine **Further information:** Naturalistic baseline period for 4 weeks, given 10mg/day haloperidol treatment, then 1 week wash-out period. During trial, free cigarette packs given to patients at standard smoking times in unit, or on their ground privileges. Non-responsive participants went on to a second and/or third 16 week double blond trial at the remaining doses **Sample sizes:** 50 smokers and non-smokers (44 entered 4 week baseline phase, analysis based on 38 participants who smoked but some individuals were included	**Primary outcomes:** Plasma cotinine levels (ng/ml) **Secondary outcomes:** N/A **Follow-up periods:** 16 weeks **Method of analysis:** within-groups tests only	**Primary outcomes:** no significant changes in plasma nicotine from baseline to week 16 in the 100mg/day (p=0.7), 300mg/day (p=0.4), 600mg/day (p=0.6) treatment groups **Secondary outcomes:** N/A **Attrition details:** Drop-outs of 2 participants in 100mg and 600mg groups, used last observation carried forward approach	**Limitations identified by author:** Type II error (lack of power) **Limitations identified by team:** Only within group tests performed **Evidence gaps and/or recommendations for future research:** Further prospective studies of clozapine patients using nicotine levels are needed **Source of funding:** US National Institute of Mental Health, Novartis Research Institute provided free medication

		more than once) **Intervention 1 n=** 21 **Intervention 2 n=** 27 **Control n=** 12 **Baseline comparisons:** Unclear **Study sufficiently powered?** Unclear			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Dixon **Year:** 2009 **Study design:** Cluster randomised controlled trial **Quality score:** ++ **External validity:** ++	**Source population:** Baltimore region, USA **Eligible population:** six community mental health centres, 20 randomly selected charts of patients from each clinic every 2 months, psychiatrists and clinical staff reviewed patient roster who thought to meet the inclusion criteria **Selected population:** DSM-IV criteria for schizophrenia spectrum disorder or affective psychoses or other psychoses, 18-64 years, at least 1 cigarette per month, English speaking, at least 2 appointments with psychiatrist in past 6 months, informed consent **Excluded population:** Not reported **Setting:** Outpatients	**Method of allocation:** Randomised each pair of clinics, one to each treatment **Intervention description:** Clinics wide immediate implementation of the 5 A's (i. assessing whether the participant smoked, ii. advising identified smokers to quit immediately, iii. assess the willingness of the participant to make a quit attempt within the next 30 days, iv. assist those identified as willing to make optimal quitting plans, which included provision of education handouts, v. arrange for next visit, which was likely to include group behavioural therapy) **Control description:** Delayed implementation of 5 A's for 6 months, then implemented after delay **Sample sizes:** 304 **Intervention n=** 156 **Control n=** 148 **Baseline comparisons:**	**Primary outcomes:** Point prevalence (7 day, bio-verified by expired CO<10ppm) **Secondary outcomes:** Self-report number of cigarettes smoked per week **Follow-up periods:** 6 months **Method of analysis:** Mixed effect hierarchical linear model or logistic regression, or generalized estimating equation	**Primary outcomes:** No significant difference from baseline to 6 months follow-up for whether the participant had smoked in the last 7 days between the immediate and delayed implementation groups (self-report smoking status, p=0.73; expired CO<10ppm, p=0.14). **Secondary outcomes:** No significant difference was seen from baseline to 6 months follow-up for in the number of cigarettes smoked in the last 7 days between the immediate and delayed implementation groups (p=0.36). **Attrition details:** Overall follow-up rates of 84% at 6 months and 77% at 12 months, stated intention to treat analysis	**Limitations identified by author:** Relatively short term follow-up, participants not selected based on motivation, sites may have varied **Limitations identified by team:** No further limitations identified **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** National Institutes of Drug Abuse

		Unclear **Study sufficiently powered?** Unclear			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Dutra **Year:** 2012 **Study design:** Uncontrolled before and after study **Quality score:** - **External validity:** -	**Source population:** Massachusetts, USA **Eligible population:** Massachusetts General Hospital **Selected population:** DSM-IV diagnosis of schizophrenia, clinicall stable, stable dose of antipsychotic medication for at least 1 month, reported use of at least 10 cigarettes per day for at least 6 months, expired CO level>9ppm or salivary cotinine>20ng/ml, and willing to set a quit date in the next 2-3 weeks **Excluded population:** Lifetime history of dementia, neurodegenerative disease or other organic mental disorder, substance use disorder in past 6 months, major depressive disorder in past 6 months, inpatient hospitalization for suicide ideation in prior 12 months, current suicide or homicidal ideation, current unstable medical	**Method of allocation:** None **Intervention description:** Varenicline, 2mg/day for 12 weeks **Control description:** Baseline, no intervention **Further information:** All participants received 12 weekly one hour group session of cognitive behavioural therapy intended to promote smoking cessation **Sample sizes:** 102 (53 evaluable) **Intervention n=** 102 **Control n=** 102 **Baseline comparisons:** Within participant design **Study sufficiently powered?** No	**Primary outcomes:** 14 day point prevalence abstinence (bio-verified by CO<9ppm) **Secondary outcomes:** Not reported **Follow-up periods:** 12 weeks **Method of analysis:** Methods not reported clearly	**Primary outcomes:** 32 participants (60.4%) achieved 14 day point prevalence abstinence at 12 weeks. **Secondary outcomes:** Not applicable **Attrition details:** Only 53 participants from a potential of 102 were analysed	**Limitations identified by author:** Small sample size, concurrent administration of varenicline and cognitive behaviour therapy, no control group, concurrent medications for schizophrenia **Limitations identified by team:** Only 53 participants completed the 12 weeks smoking cessation trial (58%) **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** NIDA

	illness, renal insufficiency, plan to continue to use other tobacco, use of investigational medication or device in past 30 days **Setting:** Outpatients				

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Evins **Year:** 2001 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** +	**Source population:** Massachusetts, USA **Eligible population:** Urban community health centre **Selected population:** DSM-IV diagnosis of schizophrenia, stable dose of antipsychotic medication for at least 4 weeks, reported cigarette use greater than half a packet per day and had desire to quit smoking **Excluded population:** Experiencing acute exacerbation of psychosis, active co-morbid substance abuse, bulimia, or if history of seizure disorder, if current, but not past, major depressive episode **Setting:** Outpatients	**Method of allocation:** Unclear **Intervention description:** Bupropion SR, 150mg/day for 12 weeks **Control description:** Placebo, for 12 weeks **Further information:** All received brief advice to stop smoking from their treating psychiatrist and then began study medication and CBT group quit smoking group programme designed for patients with schizophrenia, 9 weekly 1-hour sessions, co-led by nurse experience in smoking cessation counselling and a cognitive behavioural psychologist, focused on attention, memory and complex information processing **Sample sizes:** 18 **Intervention n=** 9 **Control n=** 9 **Baseline comparisons:** No differences at baseline **Study sufficiently powered?** No	**Primary outcomes:** Point prevalence abstinence (bio-verified by CO<9ppm or serum cotinine<14ng/ml) **Secondary outcomes:** 50% reduction from baseline in self-reported cigarettes smoked per day (bio-verified by at least 30% reduction in expired CO), expired CO levels **Follow-up periods:** 12 and 24 weeks **Method of analysis:** Repeated measures ANOVA, chi-squared tests	**Primary outcomes:** 4 subjects achieved abstinence at quit date – 3 in bupropion and 1 in placebo (bio-verified) Abstinence reported in 1/9 on bupropion & 0/9 on placebo Smoking reduction reported in 6/9 on bupropion and 1/9 on placebo at 12 weeks At 6 months follow-up, 50% reduction in smoking in 3/9 on bupropion, 1/9 on placebo Week 12, expired CO more reduced in bupropion than placebo ($p<0.01$) and at week 24 ($p=0.03$), repeated measures ANOVA from week 4-12 ($p<0.001$), and during weeks 14-24 ($p<0.001$) CO levels lower by 14.8ppm more in bupropion than placebo during active treatment and 14.3ppm during follow-up Serum cotinine lower at week 12 from baseline in bupropion than placebo	**Limitations identified by author:** Small sample size **Limitations identified by team:** Insufficient information regarding population **Evidence gaps and/or recommendations for future research:** Harm reduction trial of bupropion SR and CBT in patients with schizophrenia. Trial of 300mg/day bupropion and combination of 300mg/day bupropion and NRT to assess if enhances effectiveness of smoking cessation in schizophrenia **Source of funding:** National Association for Research on Schizophrenia and Affective Disorders, and NIDA. GalaxoWelcome provided bupropion DR and identical placebo tablets

				(mean diff 108ng/ml). **Secondary outcomes:** **Attrition details:** Only one participant dropped out	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Evins **Year:** 2005 **Study design:** Randomised controlled trial **Quality score: ++** **External validity: ++**	**Source population:** Massachusetts, USA **Eligible population:** Five urban community mental health centres **Selected population:** DSM-IV criteria for schizophrenia or schizoaffective disorder, depressed type, stable symptoms and a stable dose of antipsychotic medication for 30 days, baseline Hamilton Depression score<20, smoked 10+ cigarettes per day, willing to set a quit date within 4 weeks of enrolment **Excluded population:** DSM-IV for current major depression, had seizure disorder, history of bulimia, and history of mania or substance abuse disorder other than nicotine or caffeine within 6 months of enrollment. Clozapine	**Method of allocation:** Unclear **Intervention description:** Bupropion SR, 150mg per day for 7 days, evaluated change in psychiatric symptoms, if tolerated medication okay then increased dose to 150mg twice per day for rest of 11 week trial **Control description:** Placebo **Further information:** All participants received 12 weekly sessions of group CBT programme, delivered by 1 or 2 psychologists who completed training, max of 6 subjects per group. Emphasised education, motivational enhancement, problem solving, relapse prevention, individualised planning regarding coping triggers, and behavioural goal setting **Sample sizes:** 57 (53 analysed)	**Primary outcomes:** Point prevalence and continuous abstinence from smoking in past 7 days (bio-verified by CO<9ppm) **Secondary outcomes:** Self-reported number of cigarettes smoked in past 7 days , expired CO levels, duration of abstinence **Follow-up periods:** 12 weeks, 3 months post end of treatment **Method of analysis:** Fisher's Exact test, repeated measures ANOVA, paired t tests	**Primary outcomes:** Bupropion group were more likely to achieve continuous abstinence at 1 week immediately after target quit date (one week before the 4-week assessment) and at the end of treatment. 7 day point prevalence abstinence in week after quit date was 36% versus 7% p=0.016. 7 day point prevalence abstinence at week 12 was 16% versus 0%; p=0.043. 4-week continuous abstinence at week 12 significantly more likely in bupropion than placebo (16% versus 0%; p=0.043). Two weeks after end of study treatment (week 14), abstinence was 8% versus 3.6% (not sig). 3 months follow-up (week 24), 7 day point prevalence abstinence was 4.0% versus 3.6% (not sig). **Secondary outcomes:** Cigarettes smoked per day: baseline to week 12, mean reduction of 26.5 (bupropion) versus 10.2 (placebo) cigs per day, p=0.002, same effect at week 14 (p=0.018), but then	**Limitations identified by author:** None reported **Limitations identified by team:** Intention to treat analysis not used **Evidence gaps and/or recommendations for future research:** Longer duration of bupropion use therapy may reduce relapse rates. Combination study of NRT and bupropion for smoking cessation in schizophrenia. Assess if clozapine or other atypical antipsychotic medications are associated with increased cessation in patients on bupropion **Source of funding:** National Association for Research on Schizophrenia and Affective Disorders, and NIDA. GalaxoWelcome provided bupropion DR and identical placebo tablets

	at dose of >500mg/day without adequate dose of an anticonvulsant **Setting:** Outpatients	**Intervention n=** 25 **Control n=** 28 **Baseline comparisons:** No differences at baseline **Study sufficiently powered?** Post hoc power calculation based on difference between treatment groups of 10.3 points on PANSS total score and 14.9 points on SANS (80% power), but these were not the primary hypothesis of the study which was smoking cessation		not significant at week 18 or week 24. Mean duration of abstinence was longer in bupropion than placebo (mean 2.0 versus 0.25 weeks, p=0.005). Weeks 4 – 12, CO significantly lower in bupropion versus placebo, p=0.029. Mean reduction in CO from baseline of 44% versus 20%, but then no sig difference for weeks 14-24 **Attrition details:** 4 participants dropped out of study	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Evins **Year:** 2007 **Study design:** Randomised controlled trial **Quality score:** ++ **External validity: +**	**Source population:** Massachusetts, USA **Eligible population:** Four urban mental health centres **Selected population:** Adults with schizophrenia DSM-IV, capacity to consent, stable psychiatric symptoms and antipsychotic dose for 30 days or more, smoked 10+ cigarettes per day for past year, willing to set a smoking quit date within 4 weeks of enrollment **Excluded population:** DSM-IV for current major depressive disorder, Hamilton rating scale for depression score >19, or substance use disorder other than nicotine or caffeine within 6 months of screening, couldn't be taking bupropion or NRT in prior month, those with seizure and bulimia, or those on clozapine of more than 500mg/day without a therapeutic dose of an anticonvulsant	**Method of allocation:** Unclear **Intervention description:** Bupropion SR, 150mg for 7 days increasing to 150mg twice daily for 11 weeks **Control description:** Placebo for 11 weeks **Further information:** All receive 12-session 1 hour, weekly smoking cessation group programme with 3-7 participants lead by psychologist with tobacco treatment specialist training. Set quit date and then received NRT patches – 21mg/day for 4 weeks, 14mg/day for 2 weeks, 7mg/day for 2 weeks, then discontinued. NRT gum distributed and used as needed for craving up to 18mg/day (gum in 2mg doses) **Sample sizes:** 51 **Intervention n=** 25 **Control n=** 26 **Baseline comparisons:** no differences at baseline **Study sufficiently**	**Primary outcomes:** Smoking cessation at 3 months, continuous abstinence (bio-verified by CO, cut off not reported) **Secondary outcomes:** 50% reduction in smoking compared to baseline by self-report (bio-verified by at least 40% reduction in expired CO levels), number of cigarettes smoked per day, expired CO levels **Follow-up periods:** 3 months, 12 months **Method of analysis:** Chi squared, t tests, repeated measures mixed model ANOVA	**Primary outcomes:** 4 week abstinence at week 8 – 52% versus 19% p=0.014. But continuous abstinence did not vary between the groups after week 8. **Secondary outcomes:** Smoking reduction: bupropion 60% versus placebo 31% (p=0.036) at week 12; 32% versus 8%; p=0.039 at week 24. From weeks 4-24 those on bupropion has CO levels significantly lower than placebo group (mean difference 7.6; p=0.006). Significant effect of treatment on CO levels at each time point p=0.002. Cigarettes smoked per day: week 12 from baseline = -21 versus -11 cigs/day less; no p value At week 24 from baseline = -9.5 versus -2.9, no p value reported **Attrition details:** Assumed missing outcomes were smokers	**Limitations identified by author:** Small sample size **Limitations identified by team:** Insufficient information regarding source population and setting **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Massachusetts Department of Mental Health Federal Block grant. GlaxoSmithKline provided SR and identical placebo

	Setting: Unclear	**powered?** Sample size calculation based on projected rate of 50% to 100% smoking reduction of 60% in bupropion and 20% in placebo for smoking cessation. 52 participants needed to have two sided alpha 0.05, 80% power		(5 in bupropion group and 8 in placebo group at week 12)	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Fatemi **Year:** 2005 **Study design:** Randomised controlled cross-over trial **Quality score:** - **External validity:** -	**Source population:** Minnesota, USA **Eligible population:** Tobacco research centre **Selected Population:** DSM-IV criteria for schizophrenia or schizoaffective disorder and nicotine dependence. Encouraged to reduce smoking rates rather than quit entirely **Excluded population:** Not reported **Setting:** Outpatients	**Method of allocation:** Unclear **Intervention description:** Bupropion HCl for 21 days, dose not given **Control description:** Placebo for 21 days **Further information:** Week 1 – baseline measurements; weeks 2 to 4 – treatment A; week 5 – washout and baseline measurements, weeks 6 to 8 – treatment B **Sample sizes:** 10 **Intervention n=** 10 **Control n=** 10 **Baseline comparisons:** Cross over design **Study sufficiently powered?**	**Primary outcomes:** N/A **Secondary outcomes:** Self-reported number of cigarettes smoked per day, expired CO levels, urine cotinine levels **Follow-up periods:** 3 weeks **Method of analysis:** Mixed model ANOVA	**Primary outcomes:** N/A **Secondary outcomes:** the study reported "no difference in cigarettes per day" been the treatment groups. Figures showed reductions in exhaled CO, urine cotinine and metabolites as compared to placebo phase which showed non significant increases in all three measures **Attrition details:** One out of 10 participants withdrew	**Limitations identified by author:** Small sample size, short intervals between outcome timings **Limitations identified by team:** Outcomes measured at several time points, but only selected ones reported in paper, no statistical results presented, insufficient details regarding dose of treatment **Evidence gaps and/or recommendations for future research:** Identify pharmacogenetic mechanisms important in smoking reduction strategies **Source of funding:** NIH Center grant

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Gallagher **Year:** 2007 **Study design:** Randomised controlled trial **Quality score:** - **External validity:** -	**Source population:** Tucson, Arizona, USA **Eligible population:** Three La Frontera Center, Inc. Case management sites, identified by case manger or self-referral **Selected population:** DSM-IV criteria for Axis I psychotic spectrum or affective disorder that resulted in long term illness, significant symptoms and functional impairments due to disorder. 18+ years, 10+ cigarettes per day, smoked for at least 3 years, expired CO>10ppm, saliva cotinine>15ng/ml, orally English. Didn't have to commit to quitting but 48% expressed an interest, and 50% were interested in reducing smoking consumption **Excluded population:** Acute decompensation, exacerbation of psychiatric symptomatology, use of NRT, nicotine containing	**Method of allocation:** Unclear **Intervention 1 description:** Contingent payment (12 visits) **Intervention 2 description:** Contingent payment (12 visits) with NRT patches (21mg) for 16 weeks **Further information:** contingency payments: earned progressively more money for each visit is expired CO<10ppm, $25 US for completing baseline and follow-up visits, and $5 US per regular visit, maximum of $580 US over the trial **Control description:** Self-quit (minimal intervention), only three visits, completed same assessments, encouraged to use available community resources and offered tobacco and cessation related education and motivational support, distribution of NRT patches according to	**Primary outcomes:** Point prevalence abstinence (bio-verified by expired CO≤10ppm) **Secondary outcomes:** N/A **Follow-up periods:** 20 and 36 weeks **Method of analysis:** Logistic regression, ANOVA, chi-squared test	**Primary outcomes:** Abstinence at week 20 was significantly more likely in participants receiving contingency payments (OR 11.59, 95% CI 3.23-41.61) and participants receiving contingency payments with NRT (OR 13.73, 95% CI 3.85-49.03) compared to the self-quit intervention group (p=0.001). Similar significant findings were also seen at week 36 (contingency payments, OR 4.37, 95% CI 1.49-12.81; contingency payments with NRT, OR 7.87, 95% CI 2.72-22.79; compared to self-quit intervention group, p=0.001). However, when abstinence was bio-verified by saliva cotinine levels (<15ng/ml), no significant difference was seen at week 20 (p=0.08) or at week 36 (p=0.92). Reduced smoking (based on cotinine levels, but definition not clear) was	**Limitations identified by author:** attrition high, quit rates low, small sample size, non-blinding of research staff and outcome assessors **Limitations identified by team:** Length of treatment varied between intervention and control groups, those on NRT patches were told not to use patch if returned to smoking **Evidence gaps and/or recommendations for future research:** Offering choices of NRT products, smoking reduction approach to intervention rather than cessation **Source of funding:** Arizona Biomedical Research Commission

	products, unstable angina pectoris, myocardial infarction, cardiac arrhythmias, poorly controlled or accelerated hypertension prior 3 months, pregnant, lactating, planning pregnancy in next 36 weeks, medical condition deemed inappropriate **Setting:** Outpatients	study medication **Sample sizes:** 180 **Intervention 1 n=** 60 **Intervention 2 n=** 60 **Control n=** 60 **Baseline comparisons:** Participants in contingency payment group smoked more at baseline than the contingency payment and NRT group (p=0.05), other factors were not significant **Study sufficiently powered?** Insufficient details, but states wanted 60 per group		significantly more likely at week 20 in the contingency payment and contingency payment with NRT groups compared to self-quit intervention group (32% versus 12% versus 4%; p=0.02); however, no significant effect was seen at week 36. **Secondary outcomes:** **Attrition details:** One participant dropped out shortly after enrollment so another participant was recruited and randomised. Very high drop-out rate, but not significantly different at week 20 (p=0.50) or week 36 (p=0.25)	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: George **Year:** 2000 **Study design:** Quasi-randomised controlled trial **Quality score:** + **External validity:** +	**Source population:** Connecticut, USA **Eligible population:** Not clear **Selected population:** DSM-IV criteria for schizophrenia or schizoaffective disorder, and nicotine dependence, FTND≥5, motivated to quit smoking **Excluded population:** Not reported **Setting:** Unclear	**Method of allocation:** block randomization where 4-6 participant are assigned together in sequential randomisation **Intervention description:** Specialised schizophrenia group therapy treatment, weekly group therapy for 10 weeks, comprising of 3 weeks of motivational enhancement therapy, and 7 weeks of psychoeducation, social skills training, relapse prevention strategies **Control description:** American Lung Association Programme, 7 weeks motivated behaviour group therapy programme and supportive group counselling during the remaining 3 weekly group sessions. Each session 60 minutes duration **Further information:** All participants wore 24 hour NRT (21mg/day) for 6 weeks starting on target quit date, then tapered to 14mg/day for weeks 9	**Primary outcomes:** Point prevalence abstinence, continuous abstinence (weeks 8 to 12) **Secondary outcomes:** Expired CO levels **Follow-up periods:** 12 weeks and 6 months **Method of analysis:** Kaplan-Meier survival analysis, chi squared tests, hierarchical linear modeling	**Primary outcomes:** A borderline significant difference was detected for continuous abstinence (weeks 8-12, with expired CO bio-verification) in favour of the specialised schizophrenia group therapy (32.1% versus 23.5%; p=0.06). However, at 6 months follow-up a significantly greater proportion of participants in the standard therapy program were likely to be abstinent (point prevalence) than compared to the specialised therapy group (17.6% versus 10.7%; p<0.03). Those taking atypical antipsychotic medication were significantly more likely to achieve abstinence at 12 weeks than compared to those on typical antipsychotic medication (55.6% versus 22.2%; p<0.01). **Secondary outcomes:** Analysis of weekly expired	**Limitations identified by author:** Small sample size **Limitations identified by team:** Not truly randomised with significant baseline differences, post-hoc analyses for atypical versus typical comparisons, setting unclear, no psychological outcomes assessed **Evidence gaps and/or recommendations for future research:** Evaluate effectiveness of atypical versus typical agents as adjuncts for smoking cessation **Source of funding:** National Institute on Drug Abuse VISN I Mental Illness Research Education and Clinic Center grant, National Association for Research on Schizophrenia and Affective Disorders.

		and 10, and 7mg/day for weeks 11 and 12. Target quit date was during week 3 of both programmes **Sample sizes:** 45 **Intervention n=** 28 **Control n=** 17 **Baseline comparisons:** Intervention group had significantly lower negative symptoms scores and significantly more participants with schizoaffective disorders. Control group had significantly more participants on atypical antipsychotic medications **Study sufficiently powered?** No		CO levels demonstrated similar findings. **Attrition details:** Assumed drop outs were smoking at 6 months.	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: George **Year:** 2002 **Study design:** Randomised controlled trial **Quality score:** ++ **External validity:** ++	**Source population:** Connecticut, USA **Eligible population:** Outpatient smoking research clinic of the Connecticut Mental Health Center **Selected population:** DSM-IV criteria for schizophrenia or schizoaffective disorders with nicotine dependence, FTND≥5, CO≥10ppm, plasma cotinine≥150ng/ml, clinically stable on psychotic and affective symptomatology, needed to express strong desire to quit smoking **Excluded population:** history of epilepsy or seizures, history of drug or alcohol abuse or dependence in 6 months prior. Participants who dose changed for symptom stabilisation or antipsychotic side effects or those prescribed secondary antipsychotic agents in 6 months before recruitment	**Method of allocation:** Unclear **Intervention description:** Bupropion 150mg once a day for first 3 days, increasing to twice a day, for 10 weeks **Control description:** Placebo, for 10 weeks **Further information:** All participants had weekly schizophrenia smoking cessation group therapy for 10 weeks, each 60 minutes duration **Sample sizes:** 32 **Intervention n=** 16 **Control n=** 16 **Baseline comparisons:** No significant differences between groups **Study sufficiently powered?** No	**Primary outcomes:** Point prevalence abstinence (7 day, bio-verified by CO<10ppm), continuous abstinence (weeks 7 to 10, bio-verified by CO<10ppm) **Secondary outcomes:** CO levels, number of cigarettes smoked per day **Follow-up periods:** Week 10, 6 months **Method of analysis:** Kaplan-Meier survival analysis, chi squared tests, hierarchical linear modeling, logistic regression	**Primary outcomes:** At 10 weeks follow-up, the study demonstrated bupropion was significantly more likely to result in continuous abstinence (week 7-10) compared to placebo (37.5% versus 6.3%; p<0.05). However at 6 month follow-up, no significant difference was seen in the 7 day point prevalence estimates between the bupropion and placebo groups (18.8% versus 6.3%; p=0.29). A subgroup analysis based on the type of antipsychotic medication was being used by the participants (atypical [ATP] or typical [TYP]) revealed those on atypical antipsychotic medication who received bupropion were significantly more likely to quit smoking at week 10 as compared to the other groups (bupropion + ATP 66.7% versus bupropion + TYP 0% versus placebo	**Limitations identified by author:** Small sample size, lack of objective assessment of compliance with study medications **Limitations identified by team:** No further limitations **Evidence gaps and/or recommendations for future research:** Further studies of bupropion, and bupropion with NRT, for smoking cessation in schizophrenia **Source of funding:** National Institute on Drug Abuse VISN I Mental Illness Research Education and Clinic Center grant. Tablets supplied by GlaxoSmithKline.

	Setting: Outpatients			+ATP 20% versus placebo + TYP 0%; p<0.01). **Secondary outcomes:** Bupropion significantly reduced CO levels compared with placebo (p<0.05), and a significant reduction in the self-reported number of cigarettes smoked per day in the bupropion groups as compared to placebo (p<0.05). **Attrition details:** participants lost during trial or at 6 months were assumed smoking, intention to treat analysis was performed	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: George **Year:** 2008 **Study design:** Randomised controlled trial **Quality score:** ++ **External validity:** ++	**Source population:** Connecticut, USA **Eligible population:** Connecticut Mental Health Center in New Haven **Selected population:** SCID-IV criteria for schizophrenia or schizoaffective disorder, nicotine dependence, 10+ cigarettes per day, CO≥10ppm, clinically stable, total PANSS score<70 at study entry, stable dose of antipsychotic medication for at least one month and continued on same medication during trial. Baseline motivation quit scale indicating willingness to quit in next 30 days or less on contemplation ladder **Excluded population:** Positive urine drug screen, evidence of alcohol or illicit drug abuse or dependence in three prior months, history of seizure disorder, psychiatric	**Method of allocation:** Unclear **Intervention description:** Bupropion SR, started on day 8, 150mg/day for 3 days, increasing to 150mg twice a day until day 70 **Control description:** Placebo, started on day 8 **Further information:** All participants received NRT patched (21mg/24 hour) applied on day 15 (concurrent with target quit date), used till day 70. All participants received 10 weekly session of manualised behavioural therapy, duration 50 minutes each **Sample sizes:** 59 (58 analysed) **Intervention n=** 29 **Control n=** 29 **Baseline comparisons:** No significant differences between the groups **Study sufficiently powered?** Unclear	**Primary outcomes:** Continuous abstinence (day 43-70), point prevalence abstinence (day 70 and 6 months) **Secondary outcomes:** N/A **Follow-up periods:** 10 weeks (day 70), 6 months **Method of analysis:** Chi-squared test, t test, Kaplan-Meier analysis, Fisher's exact test, repeated measures ANOVA	**Primary outcomes:** Participants randomised to bupropion were significantly more likely to achieve continuous abstinence (days 43 to 70, bio-verified by expired CO) compared to the placebo group (27.6% versus 3.4%; OR 10.76, 95% CI 1.24 to 91.98; p<0.03). However, in terms of long term point prevalence abstinence at day 70, no significant difference was seen between the groups (13.8% versus 0%; p=0.11). **Secondary outcomes:** N/A **Attrition details:** One participant did not receive at least 1 dose of medication, and was excluded from analysis, Intention to treat analysis	**Limitations identified by author:** Small sample size, lack of applicability to typical outpatient smoker with schizophrenia since participants were highly motivated to quit **Limitations identified by team:** No further limitations **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** National Institute on Drug Abuse, National Alliance for Research in Schizophrenia and Depression.

	instability, unstable medical disorder, inability to give informed consent **Setting:** Outpatient				

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Hartman **Year:** 1991 **Study design:** Randomised controlled cross-over trial **Quality score:** ++ **External validity:** +	**Source population:** USA **Eligible population:** Male participants **Selected population:** Psychiatric patients voluntary receiving psychiatric service, smoked at least 10 cigarette per day, free of substantial cardiovascular disease and pulmonary disease, no current substance use disorder, did not have to indicate any desire to quit **Excluded population:** Not reported **Setting:** In-patients and outpatients	**Method of allocation:** Unclear **Intervention description:** 24μl solution containing 30% nicotine base (8mg) **Control description:** 24μl solution containing water **Further information:** Medication applied at 10am to non-dominant forearm during session and received other solution during session 2 one week later. Solution covered by 3cm square of polyethylene wrap and secured with surgical tape, allowed to smoke as much of preferred brand for seven hours **Sample sizes:** 14 **Intervention n=** 14 **Control n=** 14 **Baseline comparisons:** Within participant design **Study sufficiently powered?** No	**Primary outcomes:** N/A **Secondary outcomes:** Observed number of cigarette butts smoked **Follow-up periods:** 7 hours **Method of analysis:** Repeated measures ANOVA	**Primary outcomes:** N/A **Secondary outcomes:** Participants smoked significantly less cigarettes during the 7 hour period when they were wearing the nicotine patch compared to placebo patch (mean 9.9 versus 11.8 cigarettes smoked, $p<0.04$) **Attrition details:** One drop-out	**Limitations identified by author:** Not reported **Limitations identified by team:** Very short follow-up, lack of bio-verified outcome **Evidence gaps and/or recommendations for future research:** Not reported **Source of funding:** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Hertzberg **Year:** 2001 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** +	**Source population:** USA **Eligible population:** Durhan Veterans Affairs Medical Center, male combat veterans, PTSD outpatient treatment programme **Selected population:** DSM-IV for primary diagnosis of PTSD, no psychotropic medication or stable psychotic regimen, same dose and drug for 6 months **Excluded population:** Not reported **Setting:** Outpatient	**Method of allocation:** Unclear **Intervention description:** Bupropion SR, 150mg for 3 to 4 days, increasing to 150mg twice per day **Control description:** Placebo **Further information:** Medication given for at least one week before target quit date. All participants received individual counselling at week 0 and "Cleaning the air" booklet, follow-up counselling sessions received, personalized messages to encourage participants to remain abstinent **Sample sizes:** 15 **Intervention n=** 5 **Control n=** 10 **Baseline comparisons:** No significant differences between groups **Study sufficiently powered?** No	**Primary outcomes:** Sustained abstinence **Secondary outcomes:** N/A **Follow-up periods:** 1, 2, 4, 8, 12 weeks, and 6 months **Method of analysis:** Repeated measures ANOVA	**Primary outcomes:** At 12 weeks follow-up, no significant difference in sustained abstinence was seen between the groups (6/10 versus 1/5; p=0.282). 8/10, 7/10, 4.10 were quit in the bupropion group as week 2, week 8 and 6 months follow-up. No clear data were reported at these time points for the placebo group **Secondary outcomes:** N/A **Attrition details:** 3/10 in bupropion and 4/5 in placebo failed to complete trial	**Limitations identified by author:** Small sample size, **Limitations identified by team:** Limited outcomes, funded by pharmaceutical company **Evidence gaps and/or recommendations for future research:** Findings should be confirmed in large sample size, double blind, placebo controlled study **Source of funding:** Galaxo Wellcome Inc. and National Cancer Institute grant

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Hill **Year:** 2007 **Study design:** Non-randomised controlled trial **Quality score:** - **External validity:** -	**Source population:** USA **Eligible population:** Brigham and Women's hospital outpatient psychiatry clinic, consecutive participants, recruited through advertisement and phone screening **Selected population:** Smokers, aged 22-65 years, smoked at least 15 cigarettes per day, interested in smoking cessation, with major depressive disorder **Excluded population:** Recent cardiac disease, diagnoses of schizophrenia, bipolar disorder, current suicide ideation **Setting:** Outpatient	**Method of allocation:** First half of participants received control, second part received intervention **Intervention description:** NRT patches, 14 mg daily for 8 weeks, applied new patch each morning, rotated site to avoid skin irritation **Control description:** No treatment **Further information:** All participants received 8 weekly sessions of CBT group therapy, 60 minutes duration adapted from CBT smoking cessation manual. Target quit date on day 8. **Sample sizes:** 9 (7 analysed) **Intervention n=** 3 **Control n=** 4 **Baseline comparisons:** No significant differences between groups **Study sufficiently powered?** No	**Primary outcomes:** N/A **Secondary outcomes:** Self-reported number of cigarettes smoked per day **Follow-up periods:** 1, 2, and 3 months **Method of analysis:** T-test, Fisher's exact test, chi-squared test, repeated measures ANOVA	**Primary outcomes:** N/A **Secondary outcomes:** No significant difference between the treatment groups on the number of cigarettes smoked per day at 3 months follow-up (p=0.12) **Attrition details:** 2 participants dropped out of the control group	**Limitations identified by author:** Small sample size **Limitations identified by team:** Lack of randomisation, high attrition, lack of objective outcome, short term follow-up **Evidence gaps and/or recommendations for future research:** Address question using randomised design with adequate sample size **Source of funding:** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Kelly **Year:** 2008 **Study design:** Randomised controlled trial **Quality score:** - **External validity:** +	**Source population:** USA **Eligible population:** Not reported **Selected population:** Smokers and non-smokers, DSM-IV diagnosis for schizophrenia or schizoaffective disorder, 18-60 years of age, chronically stable, antipsychotic agent other than clozapine, Simpson-Angus Extrapyramidal symptoms score≤4 **Excluded population:** Pregnant, DSM-IV criteria of alcohol or substance abuse or dependence in last 6 months, receiving other acetylcholinesterase inhibitors **Setting:** In-patients and outpatients	**Method of allocation:** Unclear **Intervention description:** Galantamine, 8mg/day, increasing by 8 mg every 4 weeks to max dose of 24mg/day **Control description:** Placebo, given at same intervals **Sample sizes:** 86 (includes non-smokers, 18/40 randomised to intervention and 25/42 randomised to placebo were smokers) **Intervention n=** 18 **Control n=** 25 **Baseline comparisons:** Age, education level, baseline symptoms scores, changes in 3 neuropsychological scores significantly different between the groups, but not significant in adjusted analyses of change in CO levels at 12 weeks follow-up (p>0.13) **Study sufficiently powered?** No	**Primary outcomes:** N/A **Secondary outcomes:** Number of cigarettes smoked per day, expired CO levels **Follow-up periods:** 12 weeks **Method of analysis:** Repeated measures ANOVA, chi-squared test, Spearman's correlation	**Primary outcomes:** N/A **Secondary outcomes:** Smokers who were randomised to galantamine (n=18) had non-significantly different expired CO levels to smokers randomised to placebo (n=24) (p=0.40). Additionally, no significant difference was seen in the number of cigarettes smoked at the end of the 12 weeks between the two treatment groups (p=0.11). **Attrition details:** Excluded participant who had CO<8ppm at baseline, 9 in intervention and 4 in placebo groups dropped out of study	**Limitations identified by author:** None reported **Limitations identified by team:** Lack of objective measure of abstinence, lack of bio-verified outcome, randomised smokers and non-smokers, small sample size, excluded participants from analysis that did not adhere to randomised medication **Evidence gaps and/or recommendations for future research:** Replicate findings in a controlled trial that more fully characterizes smoking behaviour **Source of funding:** Veterans Affairs Capital Network (VISN 5) Mental Illness, Research, Education and Clinical Center, Stanley Medical Research Institute, NIHR grant

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Kisely **Year:** 2003 **Study design:** Non-controlled before and after study **Quality score:** - **External validity:** -	**Source population:** Australia **Eligible population:** Fremantle Hospital Mental Health Services, participants were recruited through referral **Selected population:** 10+ cigarettes smoked per day, 18-65 years of age, clinically stable, psychiatric diagnosis **Excluded population:** **Setting:** Outpatients	**Method of allocation:** None **Intervention description:** 8 weekly 1.5 hour sessions behavioural therapy, intervention conducted by psychologist and additional facilitator as needed. Early sessions focused on developing knowledge and motivation, subsequent sessions covered different methods of stopping, CBT strategies for dealing with difficult situations, relapse prevention and a smoke-free lifestyle. Set short and long term goals of smoking reduction and cessation **Control description:** No intervention **Further information:** Participants were recruited and for the first 8 weeks they received no intervention followed by 8 weeks of behavioural therapy. Participants were allowed to use other	**Primary outcomes:** N/A **Secondary outcomes:** Retrieved case notes to assess the number of times tobacco use was recorded in the notes, FTND scores, urinary cotinine **Follow-up periods:** 8 weeks and 3 months **Method of analysis:** Chi-squared test, t-tests for comparing completers versus drop-outs. Paired t test, Wilcoxon signed rank test	**Primary outcomes:** N/A **Secondary outcomes:** At 8 weeks follow up, smoking was significantly more likely at the end of the control period than at the end of the intervention period (control, 19/19 versus intervention, 14/19; p=0.02). Half of the participants (n=10) from the cross-over trial were followed-up to three months, at which only 3 participants continued to smoke (p<0.05). The study also demonstrated at the end of the 8 weeks intervention period as compared to the control period significantly lower cotinine levels (p=0.046) and significantly lower FTND scores (p=0.002). **Attrition details:** 50% drop out rate	**Limitations identified by author:** High attrition rate, non-blinded assessment of outcome **Limitations identified by team:** No blinding of treatments, no control, short term follow-up, non-randomised design **Evidence gaps and/or recommendations for future research:** Larger randomised controlled trials to assess the contribution of NRT, bupropion, and group interventions, whilst adjusting for antipsychotic medications in the analyses. Assess whether group programmes designed for this population are better than generic interventions **Source of funding:** Healthway (Western Australia)

		smoking cessation treatment during the trial **Sample sizes:** 38 **Intervention n=** 38 **Control n=** 38 **Baseline comparisons:** Within participants design **Study sufficiently powered?** No			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Li **Year:** 2009 **Study design:** Randomised controlled trial **Quality score:** - **External validity:** -	**Source population:** China **Eligible population:** Not reported **Selected population:** Male participants with schizophrenia, but criteria for diagnosis not reported **Excluded population:** Not reported **Setting:** In-patients	**Method of allocation:** Unclear **Intervention description:** Bupropion, 75mg twice/day for 1 week, increasing to 150mg twice/day for 3 weeks **Control description:** Placebo, for 4 weeks **Sample sizes:** 69 **Intervention n=** 36 **Control n=** 33 **Baseline comparisons:** Unclear **Study sufficiently powered?** Unclear	**Primary outcomes:** N/A **Secondary outcomes:** Self-reported number of cigarettes smoked per day **Follow-up periods:** 1, 4, 8 weeks **Method of analysis:** t test, non parametric test, chi-squared test	**Primary outcomes:** N/A **Secondary outcomes:** Significant decrease in the number of cigarettes used per day between the bupropion and placebo groups at the end of the first week of treatment ($p<0.01$), at the end of week 4 ($p<0.01$), and at the end of the trial (week 8, $p<0.01$). **Attrition details:** Unclear	**Limitations identified by author:** Abstract did not report limitations **Limitations identified by team:** Short follow up, insufficient methodological details, lack of bio-verified smoking status **Evidence gaps and/or recommendations for future research:** Not reported **Source of funding:** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: McEvoy **Year:** 1995 **Study design:** Randomised controlled trial **Quality score:** - **External validity:** +	**Source population:** USA **Eligible population:** Not reported **Selected population:** DSM-III-R criteria for chronic schizophrenia, smoked cigarettes, clinically hospitalised for substantial persistent psychopathology **Excluded population:** Not reported **Setting:** In-patients	**Method of allocation:** Unclear **Intervention 1 description:** High plasma clozapine range (350-450 ng/ml) **Intervention 2 description:** Medium plasma clozapine range (200-300ng/ml) **Control description:** Low plasma clozapine range (50-150ng/ml) **Further information:** All participants initially received 2 weeks baseline treatment with haloperidol (typical antipsychotic medication) **Sample sizes:** 12 **Intervention 1 n=** 5 **Intervention 2 n=** 3 **Control n=** 4 **Baseline comparisons:** Groups did not differ significantly at baseline **Study sufficiently powered?** No	**Primary outcomes:** N/A **Secondary outcomes:** Number of cigarettes smoked per day, expired CO levels **Follow-up periods:** 12 weeks **Method of analysis:** Ranked difference scores	**Primary outcomes:** N/A **Secondary outcomes:** Significant reductions in the change from baseline to week 12 in number of cigarettes smoked per 120 minute period (p=0.02), and significant reductions in the levels of expired CO at 12 weeks (p=0.04); however, only the medium range group was associated with a significantly greater decline in expired CO than compared to the low range group. **Attrition details:** Unclear	**Limitations identified by author:** None reported **Limitations identified by team:** Very small sample size, baseline expired CO levels lower in low plasma group as compared to intervention groups, no measure of abstinence, short follow-up **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: McEvoy **Year:** 1999 **Study design:** Randomised before and after study **Quality score:** + **External validity:** +	**Source population:** USA **Eligible population:** Recruited consecutive cases, smokers and non-smokers **Selected population:** DSM-III-R criteria for schizophrenia, all previously failed to respond to adequate trials of at least 2 conventional antipsychotic medications **Excluded population:** Not reported **Setting:** Unclear (seems like in-patients)	**Method of allocation:** Unclear **Intervention 1 description:** High plasma dose (350-450ng/ml) **Intervention 2 description:** Medium plasma dose (200-300ng/ml) **Control description:** Low plasma dose (50-150ng/ml) **Further information:** Dose increments of 25-50mg every 1-2 days to bring to assigned dose range. Tapered baseline treatments. Maximum dose of 900mg. All received haloperidol or fluphenazine (typical antipsychotic medications, mean dose of 21mg/day, range 5-60mg daily) and anti-cholinergic, antiparkinsons drug. **Sample sizes:** 70 (55 smokers) **Intervention 1 n=** 20 **Intervention 2 n=**28	**Primary outcomes:** N/A **Secondary outcomes:** Research staff counted number of cigarette butts smoked by participation during 120 minutes of free available cigarette smoking cessation, expired CO level, serum nicotine and cotinine levels at end of 120 minute session **Follow-up periods:** 12 weeks **Method of analysis:** t-tests, chi-squared tests, repeated measures ANOVA	**Primary outcomes:** N/A **Secondary outcomes:** Participants receiving higher plasma level doses (combination of medium and high plasma level groups) were significantly more likely to have a greater reduction in the number of cigarettes smoked during the 120 minutes between baseline and 12 weeks compared to the low plasma level group (p=0.005). However, no significant differences were seen between the higher plasma level groups compared to the low plasma level group in the change from baseline to week 12 for expired CO levels (p=0.24), plasma nicotine levels (p=0.57), or plasma cotinine levels (p=0.27). **Attrition details:** 66 completed the trial (94%), last observation carried forward approach used	**Limitations identified by author:** Small sample size in whom serum nicotine and cotinine were measured, no stratification by smoking status **Limitations identified by team:** Short follow-up **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** National Institute on Drug Abuse, National Alliance for Research on Schizophrenia and Depression

		Control n= 22 **Baseline comparisons:** Unclear **Study sufficiently powered?** >95% power to detect effect for CO, but only 55% and 70% power for nicotine and cotinine, respectively. Limited details given			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: McFall **Year:** 2005 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** ++	**Source population:** USA **Eligible population:** Veterans Affairs Puget Sound Health Care System, PTSD clinic, refusal rate to participate was 3% **Selected population:** DSM-IV criteria for PTSD, 10+ cigarettes smoked per day, willing to receive smoking cessation treatment **Excluded population:** Smokeless tobacco, pipe or cigars, unstable axis I disorder, current substance dependence disorder other than tobacco **Setting:** Outpatients	**Method of allocation:** Unclear **Intervention description:** Integrated care – 5 individual behaviour counselling cessations, once a week and one follow-up contact, duration about 20 minutes each, administered by PTSD clinic prescriber and case manager **Control description:** Usual standard of care – referred to Veterans Affairs Puget Sound Health Care Systems Smoking cessation clinic, one group orientation class, individual session in which receive treatment and behavioural counselling, received no tobacco-cessation interventions from PTSD clinic provider **Further information:** All subjects got unrestricted access to usual care. Medications could include bupropion, varenicline, NRT, NRT gum, NRT spray,	**Primary outcomes:** Point prevalence abstinence (7 day, expired CO≤10ppm) **Secondary outcomes:** N/A **Follow-up periods:** 2, 4, 6 and 9 months after randomisation **Method of analysis:** Chi-squared test, t test, Mann-Whitney U test, generalized estimating equations	**Primary outcomes:** At each assessment time (up to 9 months follow-up), participants receiving integrated care were significantly more likely to be abstinent (7 day point prevalence) compared to participants receiving standard care (OR 5.23, 95% CI 1.76 to 15.54; p<0.002) **Secondary outcomes:** N/A **Attrition details:** 17% lost across all 4 assessments	**Limitations identified by author:** No clearly demarcated quit date or end of intervention period, no biomarkers on long term smoking cessation, small sample size **Limitations identified by team:** Different number of sessions between intervention and control, therefore differences may be due to number of contacts rather than content **Evidence gaps and/or recommendations for future research:** More research on integrated models of smoking cessation treatment for mentally ill participants **Source of funding:**

		from psychiatrists or nurse practitioner managing pharmacological treatment for PTSD **Sample sizes:** 66 **Intervention n=** 33 **Control n=** 33 **Baseline comparisons:** No significant difference between groups **Study sufficiently powered?** Unclear			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: McFall **Year:** 2010 **Study design:** Randomised controlled trial **Quality score:** ++ **External validity:** ++	**Source population:** USA **Eligible population:** Ten Veterans Affairs Medical Centers **Selected population:** DSM-IV diagnosis for PTSD, engaged in outpatient PTSD care, PTSD related to military service, 10+ cigarettes smoked per day on at least 15 out of 30 days before screening, consented to receive cessation interventions **Excluded population:** Non cigarette tobacco, DSM-IV current psychotic, bipolar or substance dependence disorder other than nicotine, severe psychiatric symptoms, psychosocial instability or cognitive impairment **Setting:** Outpatients	**Method of allocation:** Stratified adaptive randomisation within each site based on sex, alcohol abuse or dependence in partial remission, current major depressive disorder, prior smoking abstinence, heavy smoking **Intervention description:** Integrated care – PTSD clinicians delivered individual sessions based on 5 weekly core tobacco cessation sessions focusing on tobacco use education, behavioural skills for quitting smoking, setting a quit date and relapse prevention. Cessation medications allowed. Three follow-up monthly booster visits re-applied smoking cessation treatment to continued smokers **Control description:** Usual standard of care - referral to specialised cessation clinics at each site, treatment within 6 weeks of referral,	**Primary outcomes:** Prolonged abstinence (self-report and bio-verified by CO≤8ppm and urine cotinine<100ng/ml), point prevalence abstinence (7 day and 30 day) **Secondary outcomes:** N/A **Follow-up periods:** 18 months **Method of analysis:** Chi-squared test, t test, logistic regression, generalized estimating equations	**Primary outcomes:** bio-verified point prevalence at 6 months follow-up was significantly higher in the integrated care group compared to the usual standard care group (7 day point prevalence, 78/472 versus 34/471, p<0.001; 30 day point prevalence, 65/472 versus 28/471, p=0.001). Self-reported prolonged abstinence bio-verified by expired CO at 12 months follow-up was significantly more likely in the integrated care group compared to the usual standard care group (Adjusted OR 2.26, 95% CI 1.30 – 3.91). The treatment effect was reported to be consistent across all subgroups considered. At 18 months follow-up, bio-verified point prevalence abstinence was significantly more likely in the integrated care group compared to the usual standard care group (7	**Limitations identified by author:** Selected sample of predominately older male Vietnam-era veterans with chronic PTSD and co-occuring depression, lack of blinding for outcome assessor **Limitations identified by team:** Number of session differed between the groups, therefore difference could be related to higher contact rather than content of sessions **Evidence gaps and/or recommendations for future research:** Future trials focusing on younger Iraq and Afghanistan veterans **Source of funding:** US Department of Veterans Affairs Cooperative Studies Program

		prescribed medications directly or through general practitioners **Further information:** Cessation medications included NRT, bupropion and varenicline **Sample sizes:** 943 **Intervention n=** 472 **Control n=** 471 **Baseline comparisons:** No differences at baseline between the treatment groups **Study sufficiently powered?** Sample size of 1400 needed for 90% power, cessation rates of 6% versus 11%, two sided at 5% level. 78% power on the 943 participants achieved in the trial		day point prevalence, 86/472 versus 51/471, p<0.001; 30 day point prevalence, 80/472 versus 44/471, p<0.001). **Secondary outcomes:** N/A **Attrition details:** Intention to treat analysis, assumed drop outs were not abstinent	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Morris **Year:** 2011 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** +	**Source population:** USA **Eligible population:** Four community mental health clinics in both urban and rural areas **Selected population:** Psychiatric diagnoses and continued to receive treatment as usual during the course of the study, at least 5 cigarettes per day, 18+ years of age, informed consent and participation in groups, English speaking, interested in quitting regardless of motivational readiness to quit **Excluded population:** Current severe psychiatric symptoms including suicidal ideation, current clinically significant substance abuse **Setting:** Outpatients	**Method of allocation:** Unclear **Intervention description:** Quitline service and community tobacco cessation group, up to 10 sessions based on "Smoking Cessation for Persons with Schizophrenia". Group facilitators were mental health clinicians with group therapy experience **Control description:** Quitline service only, through fax referral **Further information:** Quitline service included 5 proactive calls to assist with quit attempts, promoted healthier lifestyles, and prevent relapse. Up to 12 weeks of free NRT patches (21mg for weeks 1-6, decreasing to 14mg for week 7-8 and 7mg for weeks 9-12) **Sample sizes:** 123 **Intervention n=** 62 **Control n=** 61 **Baseline comparisons:** No	**Primary outcomes:** Point prevalence abstinence (7 day, bio-verified by CO<6ppm) **Secondary outcomes:** 50% reduction in self reported number of cigarettes smoked from baseline **Follow-up periods:** 6 months **Method of analysis:** Chi-squared test, t test, multiple logistic regression, generalized linear models	**Primary outcomes:** Reports 6 months intention to treat smoking cessation rate was 7%. **Secondary outcomes:** Participants who had received the group therapy in addition to the quit-line were significantly more likely to achieve 50% reduction in the self-reported number of cigarettes smoked per day at 6 months compared to those who solely received the quit-line (21% versus 8%; Adjusted OR 3.16, 95% CI 1.04-9.65; p=0.045). **Attrition details:** 87/123 received at least one treatment session, 83 reported 6 month data. Participants drop out was significantly related with primary psychiatric diagnosis, but were not different on sociodemographic variables. Intention to treat analysis	**Limitations identified by author:** Small sample size, drop-out related to psychiatric diagnosis (highest in those with depression), training may have been insufficient for mental health illness population **Limitations identified by team:** No results reported for cessation for each treatment group, difference intensity of treatment for behavioural support which may be related to differences in outcome, rather than the content of the sessions **Evidence gaps and/or recommendations for future research:** Identify dose of counselling and NRT and/or other medications needed to assist with reduction and cessation in this population **Source of funding:** Colorado Tobacco Tax

		baseline differences noted **Study sufficiently powered?** Post hoc test showed 81% power to detect difference of 0.52 standard deviations difference between the groups			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Panchas **Year:** 2012 **Study design:** Uncontrolled before and after study **Quality score:** - **External validity:** -	**Source population:** Massachusetts, USA **Eligible population:** Massachusetts General Hospital **Selected population:** DSM-IV diagnosis of schizophrenia, clinicall stable, stable dose of antipsychotic medication for at least 1 month, reported use of at least 10 cigarettes per day, expired CO level>9ppm, desire to quit smoking **Excluded population:** Unstable medical illness, diagnosis of dementia or substance use disorder other than nicotine or caffeine in the prior 6 months, or hospitalization for suicide ideation in the prior 12 months **Setting:** Outpatients	**Method of allocation:** None **Intervention description:** Varenicline, 2mg/day for 12 weeks **Control description:** Baseline, no intervention **Further information:** All participants received 12 weekly one hour group session of cognitive behavioural therapy intended to promote smoking cessation **Sample sizes:** 112 **Intervention n=** 112 **Control n=** 112 **Baseline comparisons:** Within participant design **Study sufficiently powered?** 80% power to detect a medium effect size or larger (d=0.3) assuming a correlation of 0.5 between before and after measurements, using a paired t-test	**Primary outcomes:** At least 2 weeks continuous abstinence (bio-verified by CO<9ppm) at week 12; at least 4 weeks continuous abstinence (bio-verified by CO<9ppm) at week 12 **Secondary outcomes:** Expired CO levels **Follow-up periods:** 12 weeks **Method of analysis:** Repeated analysis using generalized estimating equations, and paired t tests	**Primary outcomes:** 53 (47.3%) achieved at least 2 weeks abstinence at week 12. 38 (34%) achieved at least 4 weeks abstinence at week 12. **Secondary outcomes:** Expired CO levels significantly decreased from baseline to week 12 ($p<0.01$). CO levels at baseline (22.6±14.2)ppm versus week 12 or early termination (9.0±12.7)ppm **Attrition details:** Only 53 participants from a potential of 102 were analysed	**Limitations identified by author:** Small sample size, many participants terminated early (33%), but 28/37 who terminated early or dropped-out completed the questionnaire, no control group **Limitations identified by team:** No further limitations identified **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** NIDA

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Roll **Year:** 1998 **Study design:** Within participant reversal design (Active →Control→Active) **Quality score:** - **External validity:** -	**Source population:** Vermont, USA **Eligible population:** Local mental health centre **Selected population:** DSM –IV schizophrenia or schizoaffective disorder, undergoing treatment for schizophrenia, current cigarette smokers, 18+ years of age, expired CO≥18ppm, none considering quitting cigarette smoking up on entering the study **Excluded population:** Not reported **Setting:** Outpatients	**Method of allocation:** None **Intervention description:** Week 2 of trial, visited three times per day, if expired CO was ≤11pm, they received $3 US for the first reading, then an additional $0.50 US for each subsequent reading≤11ppm. Up to max of $10 US. If received 3 consecutive readings≤11ppm then got an extra $10 US bonus. Total amount if abstinent on all 15 reading for the week was $147 US **Control description:** Week 1 and 3, visited once per day, received $5 US for each day irrespective of CO reading **Sample sizes:** 11 **Intervention n=** 11 **Control n=** 11 **Baseline comparisons:** Within participant design **Study sufficiently powered?**	**Primary outcomes:** N/A **Secondary outcomes:** Number of expired CO readings≤11ppm, mean expired CO levels **Follow-up periods:** One week **Method of analysis:** Repeated measures ANOVA, Fisher's exact test (not allowing for design of study)	**Primary outcomes:** N/A **Secondary outcomes:** There was a significant difference in the mean expired CO levels across the three conditions (mean 35.9 versus 15.9 versus 25.9ppm; p<0.05). Additionally, the total numbers of expired CO levels≤11pppm between the baseline phases and the active phase were significantly different (baseline 1 versus active, p=<0.05; baseline 2 versus active, p<0.05); however, no significant difference was seen between the baseline phases (p>0.05). **Attrition details:** One withdrew during first week for unknown reasons	**Limitations identified by author:** None reported **Limitations identified by team:** More visits in the intervention phase than control phase, small sample size, abstinence not assessed, short follow-up **Evidence gaps and/or recommendations for future research:** Randomised controlled trials assessing the efficacy of contingency payments interventions for treating substance abuse in persons with schizophrenia **Source of funding:** Research grants, National Training Awards, National Institute on Drug Abuse grant

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Saxon **Year:** 2003 **Study design:** Uncontrolled before and after study **Quality score:** - **External validity:** +	**Source population:** Seattle, Washington, USA **Eligible population:** Smoking cessation programme located within outpatients section of Addiction Treatment Center at Veterans Affairs Puget Sound Health Care System, posters around clinic building advertised the study and referral from staff, veterans in treatment for alcohol or drug dependence voluntarily sought smoking cessation treatment **Selected population:** Dual diagnosis of alcohol and drug dependence, 74.8% had Axis I psychiatric diagnosis in addition to substance dependence, motivated to quit but not required to set a target quit date **Excluded population:** Not reported **Setting:** Outpatients	**Method of allocation:** Participants and clinician preference **Intervention description:** Compares NRT, bupropion and combination of NRT and bupropion, no doses or lengths of treatment described, doses based on response and side effect experience **Control description:** N/A **Further information:** Smoking cessation program was given to all participants, consisted of weekly group orientation sessions followed up by weekly group sessions with expired CO monitoring. Focused on psycho-education and relapse prevention. Minimum of 8 sessions, termination if missed at least four weeks of treatment. Offered NRT, bupropion, or combination of NRT and	**Primary outcomes:** N/A **Secondary outcomes:** Self-reported number of cigarettes smoked per day, expired CO levels **Follow-up periods:** Session 4, on average 10.52 days between sessions, so equates to approximately 40 days **Method of analysis:** Chi-squared test, t test, ANOVA, survival analysis, Wilcoxon Gehan statistic	**Primary outcomes:** N/A **Secondary outcomes:** Participants who received the combination treatment of NRT and bupropion were significantly more likely to have a greater reduction in the self-reported number of cigarettes smoked per day ($p=0.004$) and expired CO levels ($p<0.001$) than compared to the other treatment groups. **Attrition details:** Three participants enrolled but missed first treatment episode and were excluded from analysis, missing data were replaced by last observation carried forward	**Limitations identified by author:** Lack of control group, heterogeneity of participants in regards to baseline diagnoses and medications, non-blinded treatment assignment, lack of data on drop outs **Limitations identified by team:** Lack of randomisation, short follow-up, insufficient information regarding doses of treatments given **Evidence gaps and/or recommendations for future research:** Medical and physical benefits from significant reductions in smoking **Source of funding:** Center for Excellence in Substance Abuse Treatment and education, Veterans Affairs Puget Sound Health Care Systems

		bupropion **Sample sizes:** 115 **Intervention n=** 115 **Control n=** 115 **Baseline comparisons:** Within participant design **Study sufficiently powered?** No			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Smith **Year:** 2009 **Study design:** Uncontrolled before and after study **Quality score:** - **External validity:** +	**Source population:** USA **Eligible population:** Tertiary care psychiatric hospital or its associated outpatient clinics, continually violated hospital non-smoking rules in spite of consequences, including losing off-ward privileges for each offense, males and females were recruited but only males are included in the study **Selected population:** Schizophrenia or schizoaffective disorder, long history of smoking cigarettes, agreed to trial antismoking drug for cigarette smoking habit although most did not have a strong personal desire to definitely stop smoking **Excluded population:** Not reported **Setting:** In-patient and outpatient	**Method of allocation:** None **Intervention description:** Varenicline, 0.5 to 1mg/day in week 1, increasing to 2mg/day in weeks 2 to 9. Doses could be reduced if necessary to 1mg/day due to nausea or related side effects **Control description:** Baseline, no intervention **Sample sizes:** 14 **Intervention n=** 14 **Control n=** 14 **Baseline comparisons:** Within participants design **Study sufficiently powered?** Not reported	**Primary outcomes:** N/A **Secondary outcomes:** Number of cigarettes smoked per day, expired CO levels **Follow-up periods:** 9 weeks **Method of analysis:** Generalized linear model, related measures ANOVA	**Primary outcomes:** N/A **Secondary outcomes:** No significant difference in the number of cigarettes smoked per day between the before and after phases of the trial (mean, 36.5 versus 12.5 cigarettes/day; p=0.12). However, significant differences were seen between the before and after phases of the trial for expired CO levels (mean 8.97 versus 4.85ppm; p=0.005) and plasma cotinine levels (mean, 238.6 versus 129.8; p=0.001). **Attrition details:** Two participants dropped out (14%)	**Limitations identified by author:** Small sample size, lack of direct placebo control, in-patient hospital setting with smoking restrictions, lack of uniformly strong desire to quit smoking **Limitations identified by team:** Lack of randomisation, short follow-up, lack of abstinence outcome **Evidence gaps and/or recommendations for future research:** Whether a dose higher than 2mg/day would be beneficial in this population **Source of funding:** In-house funding

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Steinberg **Year:** 2004 **Study design:** Randomised controlled trial **Quality score:** ++ **External validity:** ++	**Source population:** USA **Eligible population:** Referral from treatment providers, responses to flyers, and direct outreach **Selected population:** At least 10 cigarette per day, diagnosis of schizophrenia or schizoaffective disorder, didn't require participants to quit smoking **Excluded population:** Inability to adequately understand the consent form **Setting:** Outpatient	**Method of allocation:** Unclear **Intervention description:** Motivational interviewing group – personalised feedback based on assessment interview, duration approximately 40 minutes and concluded with advice to quit smoking and with a referral for treatment to a specialised tobacco dependence treatment programme **Intervention 2 description:** Psycho-educational intervention – engaged in brief psycho-educational discussion on general benefits of quitting and the deleterious health effects of smoking based on standard protocol, predominately didactic but encouraged discussion. 40 mins intervention so comparable with above. Concluded intervention with advice to quit and referral for treatment	**Primary outcomes:** Referral to stop smoking service **Secondary outcomes:** N/A **Follow-up periods:** One week, one month **Method of analysis:** Chi-squared test, ANOVA	**Primary outcomes:** a higher proportion of participants sought treatment at the stop smoking service in the motivational interviewing group (25.8%) compared to the psycho-educational (0%) and brief intervention (0%) groups at one week post-therapy session. Similar effects were reported at one month post therapy session (MI, 32.3% versus psycho-educational, 11.8% versus brief intervention, 0%) **Secondary outcomes:** N/A **Attrition details:** No data were lost to follow up because they were retrievable from staff	**Limitations identified by author:** Self-selected participants, lead researcher delivered interventions, participants charts relied on for diagnoses, unknown quit rate **Limitations identified by team:** Minimal intervention had much less contact so comparisons with this could be related to contact rather than content, but the other treatment groups were comparable **Evidence gaps and/or recommendations for future research:** Refine interventions and assess in other populations **Source of funding:** Cancer Institute grant, National Institute on Drug Abuse

		Control description: Minimal-control interventions – followed greatly abbreviated assessment because standard advice and referral for treatment were meant to be the only ingredients in this intervention, this only lasted 5 minutes. **Sample sizes:** 78 **Intervention 1 n=** 32 **Intervention 2 n=** 34 **Control n=** 12 **Baseline comparisons:** No differences between treatment groups **Study sufficiently powered?** Unclear			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Szombathyne-Meszaros **Year:** 2010 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** +	**Source population:** USA **Eligible population:** Not reported **Selected population:** Schizophrenia or schizoaffective disorder with co-morbid alcohol and nicotine dependence **Excluded population:** Not reported **Setting:** Outpatients	**Method of allocation:** Unclear **Intervention description:** Naltrexone, 50mg per day given as 100mg on Monday's, 100mg on Wednesday's and 150mg on Fridays **Control description:** Placebo **Further information:** All received antipsychotic medication, and weekly motivational enhancement therapy addressing alcohol use **Sample sizes:** 79 **Intervention n=** 41 **Control n=** 38 **Baseline comparisons:** Unclear **Study sufficiently powered?** No	**Primary outcomes:** Smoking cessation **Secondary outcomes:** Number of cigarettes smoked adjusted for baseline **Follow-up periods:** 12 week **Method of analysis:** ANCOVA (analysis of covariance), Fisher's exact test	**Primary outcomes:** No significant difference was seen in the proportion of participant's achieving cessation at the end of 12 weeks between the naltrexone and placebo groups (2/41 versus 2/38) **Secondary outcomes:** No significant differences were seen in the number of cigarettes smoked per day from baseline to week 12 between the naltrexone and placebo groups; however, significantly lower numbers of cigarettes were smoked within each treatment group from baseline to week 12 (naltrexone, baseline: 126 versus end of trial: 101 cigarettes/day; placebo, baseline: 121 versus end of trial: 103 cigarettes/day) **Attrition details:** Unclear	**Limitations identified by author:** None reported **Limitations identified by team:** Insufficient methodological details in abstract **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** National Institute on Alcohol Abuse and Alcoholism, National Alliance for Research on Schizophrenia and Depression

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Thorsteinsson **Year:** 2001 **Study design:** Randomised mixed-design controlled trial **Quality score:** + **External validity:** +	**Source population:** USA **Eligible population:** Advertisements in print media over 4 years in outpatients **Selected population:** 18+ years of age, un-medicated outpatient, cigarette smoker with major depression without psychotic features as specified in the DSM-III-R, ≥14 on Hamilton Rating Scale for Depression, ≥1 cigarette pack/day for at least one year, biochemically confirmed CO≥15ppm, motivation to quit, willingness to comply with study demands **Excluded population:** Use of any psychotic medication at least 2 weeks before initiation of protocol, symptoms of psychosis, signs of suicide, significant medical history that might be affectd by nicotine, serious dermatological disease, history of alcohol or drug abuse in prior one year,	**Method of allocation:** Unclear **Intervention description:** NRT patches, 21mg/24 hours **Control description:** Placebo patch, 22mg nicotine with barrier to prevent absorption **Further information:** Applied patch each morning and rotated patch site to prevent skin irritation, target quit date on day 8, randomised to either intervention or placebo for 2 weeks (days 8-22), then placebo for one week (days 23-29) **Sample sizes:** 38 **Intervention n=** 18 **Control n=** 20 **Baseline comparisons:** No differences between groups at baseline **Study sufficiently powered?** No	**Primary outcomes:** Self-reported smoking **Secondary outcomes:** Withdrawal **Follow-up periods:** 29 days **Method of analysis:** Wilcoxon summed ranks test, chi-squared test	**Primary outcomes:** Self-reported abstinence was significantly more likely in the NRT group than compared to the placebo group (78% versus 50%; one sided $p<0.05$) at day 29 **Secondary outcomes:** No significant interaction was detected on the average total withdrawal ratings (assessed using the Nicotine symptoms Checklist and Hughes-Hatsukami Withdrawal Questionnaire) **Attrition details:** Participants dropped out of study if they resumed smoking following the target quit date or if clinical depressive symptoms worsened substantially	**Limitations identified by author:** Drop-out rate substantially higher in placebo (50%) than intervention group (22%), underpowered study **Limitations identified by team:** Lack of objective measure of abstinence, short follow-up **Evidence gaps and/or recommendations for future research:** Assess if NRT patches have an anti-depressant properties **Source of funding:** NIH, Tobacco Related Disease Research Program

	pregnant, lactating, or childbearing potential (needed to be using medically accepted birth control) **Setting:** Outpatients				

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Tidey **Year:** 2002 **Study design:** Non-randomised within subject repeated measures design trial **Quality score:** - **External validity:** +	**Source population:** USA **Eligible population:** Local outpatients mental health centre, consecutive participants **Selected population:** Schizophrenia or schizoaffective disorder confirmed by board-certified psychiatrist, regular smoker, CO≥18ppm, not actively trying to quit during study **Excluded population:** Not reported **Setting:** Outpatients	**Method of allocation:** Order was counterbalanced across participants to achieve equal numbers at each phase **Intervention 1 description:** Contingency payment for smoking reduction with NRT patch (21mg/24 hours) **Intervention 2 description:** Contingency payment for smoking reduction with placebo patch **Control description:** Non-contingent payment and placebo patch. Participants received $9.80 US for each visit regardless of CO reading **Further information:** Each phase was given for 5 consecutive days, during the washout periods participants could smoked normally, participants were visited 3 times per day for the 5 days. During contingency payment conditions, participants received $3 US for first	**Primary outcomes:** N/A **Secondary outcomes:** Smoking reduction (bio-verified by CO≤11ppm) **Follow-up periods:** Day 5 visit for each condition, 2 weeks after last day of final condition **Method of analysis:** Repeated measures ANOVA	**Primary outcomes:** N/A **Secondary outcomes:** significantly different mean expired CO level between the three conditions (mean, contingency payment with NRT 19.4ppm versus contingency payment with placebo 20.5ppm versus non-contingent payment with placebo 28.0ppm; p<0.05). Post-hoc analyses indicated significantly higher expired CO levels in the non-contingent payment with placebo group than compared to contingency payment with placebo or contingency payment with NRT; however, no significant differences were seen between the contingency payment conditions with NRT and contingency payment with placebo. Salivary cotinine levels were significantly different between the three conditions (p<0.05); with post-hoc analyses	**Limitations identified by author:** Short term outcomes **Limitations identified by team:** Small sample size, lack of randomisation **Evidence gaps and/or recommendations for future research:** Feasibility of contingency payments in a treatment program using salivary or urinary cotinine, whether a higher dose of NRT or another medication such as bupropion could add to the effectiveness of contingency payment **Source of funding:** National Institute on Drug Abuse grant, Senator Proctor award, American Lung Association of Vermont

		CO≤11ppm, increased by $0.50 US for every consecutive sample ≤11ppm, $10 US bonus for every third consecutive sample ≤11ppm. Maximum total payment possible was $147.50 US per contingency payment condition **Sample sizes:** 17 **Intervention n=** 17 **Control n=** 17 **Baseline comparisons:** Within participant design **Study sufficiently powered?** No		revealing significantly higher levels in the non-contingent payment with placebo and contingency payment with NRT compared to contingent payment with placebo **Attrition details:** Missing samples treated as >11ppm	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Tidey **Year:** 2011 **Study design:** Randomised controlled trial **Quality score:** ++ **External validity:** +	**Source population:** USA **Eligible population:** Advertisements posted in surrounding community and at outpatient clinic at local Veterans Affairs medical centres **Selected population:** DSM-IV-TR diagnosis of schizophrenia or schizoaffective disorder, 18+ years of age, 20+ cigarettes per day, FTND score≥6, clinically stable psychoactive medication for at least 2 months, 4+ score on contemplation ladder indicating some interest in quitting in next 6 months **Excluded population:** Pregnancy, positive breath alcohol level or urine drug toxicity test, medication or medical condition contraindicating bupropion, very high psychiatric symptom severity **Setting:** Outpatients	**Method of allocation:** Randomisation by coin toss **Intervention 1 description:** Contingency payment with bupropion (150mg for three days increasing to 150mg twice a day for days 4-22) **Intervention 2 description:** Contingency payment with placebo **Intervention 3 description:** Non-contingent payment with bupropion (150mg for three days increasing to 150mg twice a day for days 4-22) **Control description:** Non-contingent payment with placebo **Further information:** Conditions given for 3 weeks, **Sample sizes:** 57 (52 analysed) **Intervention 1 n=** 12 **Intervention 2 n=** 16 **Intervention 3 n=** 11 **Control n=** 13 **Baseline comparisons:** No differences between	**Primary outcomes:** N/A **Secondary outcomes:** Number of cigarettes smoked in past week, cotinine levels **Follow-up periods:** 4 weeks **Method of analysis:** ANOVA , chi-squared test	**Primary outcomes:** N/A **Secondary outcomes:** Bupropion did not significantly reduce smoking by itself or increase the effectiveness of the contingent payment intervention. However, the study did report that participants receiving contingent payments had lower cotinine levels ($p<0.001$), lower expired CO levels ($p<0.01$), and reduced number of cigarettes smoked per day ($p<0.01$) compared to non-contingent payments at weeks 3 and 4 compared to weeks 1 and 2 **Attrition details:** 4 drop outs in bupropion groups due to medication side effects, one drop out in placebo group due to lost contact. Very low dropout rates during trial (1% in intervention 1, 1% in intervention 2, 5% in intervention 3, 6% in control group). Intention to treat analysis	**Limitations identified by author:** Short treatment period, small sample size, self-reported compliance of medication **Limitations identified by team:** No further limitations **Evidence gaps and/or recommendations for future research:** Contingency payment with varenicline for smoking reduction **Source of funding:** Not reported

		treatment groups **Study sufficiently powered?** No			

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Weinberger **Year:** 2008 **Study design:** Randomised controlled trial **Quality score:** - **External validity:** +	**Source population:** Connecticut, USA **Eligible population:** Mental health center or other mental health clinics in Greater New Haven, out of 204 screened for inclusion only 5 were included in the trial (2.5%) **Selected population:** DSM-IV diagnosis of bipolar disorder and nicotine dependent cigarette smokers, 10+ cigarettes per day, expired CO>10ppm, clinically stable **Excluded population:** Current anti-depression medication, not taking or not being on stabilized mood stabilizer, current drug use, low levels of smoking, medical exclusions, refuse to participant, drop out of screening sessions, logistic reasons **Setting:** Outpatients	**Method of allocation:** Unclear **Intervention description:** Bupropion intermediate release formulation, 75mg once a day for three days, increasing to 150mg once a day for 4 days [using SR formulation], increasing to 150mg twice a day for 8 weeks, as tolerated **Control description:** Placebo **Further information:** All participants received weekly sessions of group behavioural therapy **Sample sizes:** 5 **Intervention n=** 2 **Control n=** 3 **Baseline comparisons:** No differences detected **Study sufficiently powered?** No	**Primary outcomes:** Smoking abstinence (bio-verified with expired CO<10ppm) **Secondary outcomes:** N/A **Follow-up periods:** 9 weeks **Method of analysis:** No formal analysis performed due to small sample size	**Primary outcomes:** One out of the 2 patients randomised to bupropion achieved self-reported smoking abstinence with bio-verification using expired CO compared to none of the 3 participants in the placebo group **Secondary outcomes:** N/A **Attrition details:** Non-completers were assumed to be smoking. 2 out of 3 participants on placebo discontinued medication, the remaining participant took full dose for 6 weeks and observed to have hypomaniac symptoms, increased distractibility and sexual inappropriateness at week 7 visits, therefore treatment was discontinued. 1 out of 2 participants on bupropion only took 4 weeks medication	**Limitations identified by author:** Eligible subjects difficult to recruit **Limitations identified by team:** Very small sample size, high drop-out rate **Evidence gaps and/or recommendations for future research:** Larger sample sized trials of bupropion in bipolar disorders **Source of funding:** National Institute on Drug Abuse, National Alliance Research in Schizophrenia and Depression

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Weiner **Year:** 2001 **Study design:** Uncontrolled before and after study **Quality score:** - **External validity:** -	**Source population:** USA **Eligible population:** Maryland psycahitric research centre, volunteers **Selected population:** DSM-IV schizophrenia or schizoaffective disorder, medically stable, stable cigarette smoking habits, expressed interest in decreasing their smoking, high nicotine dependence **Excluded population:** Current depressive episode, or active substance abuse and those receiving bupropion **Setting:** Outpatients	**Method of allocation:** None **Intervention description:** 14 week treatment period – 9 sessions of weekly group therapy led by clinic nurse. Told goal was to stop smoking, but they were encouraged to participate even if they were not successful in complete cessation. Adjunctive bupropion SR started on third group sessions, initially 150mg once a day for 3 days then 150 mg twice a day for the remainder of the study **Control description:** 2 week stabilisation period with no treatment **Sample sizes:** 9 **Intervention n=** 9 **Control n=** 9 **Baseline comparisons:** Within participant design **Study sufficiently powered?** No	**Primary outcomes:** N/A **Secondary outcomes:** Expired CO levels **Follow-up periods:** 14 weeks **Method of analysis:** T-tests (doesn't take into account paired nature of data)	**Primary outcomes:** N/A **Secondary outcomes:** A significant decrease in expired CO levels from baseline to week 14 (mean, 39.4 versus 18.4ppm; $p<0.05$) **Attrition details:** One participant dropped out of the study	**Limitations identified by author:** Small sample size, open-label design, lack of strict inclusion criteria regarding smoking consumption **Limitations identified by team:** Lack of randomisation, lack of control group, lack of abstinence as an outcome, incorrect statistical analysis performed **Evidence gaps and/or recommendations for future research:** More rigorous study design to assess the same hypothesis using double-blind placebo-controlled trial **Source of funding:** NIMH grant

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Weiner **Year:** 2011a **Study design:** Randomised controlled trial **Quality score:** + **External validity:** ++	**Source population:** USA **Eligible population:** Receiving care in outpatients research clinic **Selected population:** DSM-IV-TR criteria for schizophrenia or schizoaffective disorder for over 3 years, clinically stable, but still symptomatic, regular smoker at least 10 cigarettes smoked per day, smoked for at least one year, FTND score≥4 **Excluded population:** No lifetime history of suicide attempts, no suicide ideation or psychiatric hospitalisation within last 6 months, no diagnosis of substance use in last 3 months or dependence in last 6 months, not currently depressed or taking bupropion **Setting:** Outpatients	**Method of allocation:** Unclear **Intervention description:** Varenicline, 1mg twice daily for 12 weeks **Control description:** placebo, for 12 weeks **Further information:** All received individual smoking cessation counselling, all on 2nd generation antipsychotic medication **Sample sizes:** 9 **Intervention n=** 4 **Control n=** 5 **Baseline comparisons:** No differences between groups **Study sufficiently powered?** No	**Primary outcomes:** Continuous smoking abstinence (week 8-12, bio-verified by CO≤10ppm) **Secondary outcomes:** Expired CO levels **Follow-up periods:** 12 weeks **Method of analysis:** Fisher's exact test, ANCOVA (analysis of covariance)	**Primary outcomes:** No significant difference in continuous abstinence between the participants taking varenicline compared to placebo (75% versus 0%; p=0.14) **Secondary outcomes:** Expired CO levels were significantly lower in the varenicline group compared to placebo after 4 weeks of medication till the end of the trial (p=0.02) **Attrition details:** One participant dropped out of the study prior to starting placebo after being diagnosed with cocaine dependence	**Limitations identified by author:** Small sample size **Limitations identified by team:** No further limitations **Evidence gaps and/or recommendations for future research:** Larger study needed to confirm findings **Source of funding:** National Institute on Drug Abuse Residential Research Service Contract

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Weiner **Year:** 2011b **Study design:** Randomised controlled trial **Quality score:** ++ **External validity:** ++	**Source population:** Baltimore, Maryland, USA **Eligible population:** Maryland Psychiatric Research Clinic, volunteers from outpatients **Selected population:** DSM-IV diagnosis schizophrenia or schizoaffective disorder, clinically stable, ≥10 cigarettes per day, interested in quitting or cutting down **Excluded population:** Not reported **Setting:** Outpatients	**Method of allocation:** Stratified by sex, first versus second generation antipsychotic medication **Intervention description:** Bupropion SR, 150mg once per day for 3 days, increasing to 150mg twice per day for 12 weeks. Fexible dosage if needed to decrease to 150mg once daily **Control description:** Placebo for 12 weeks **Further information:** Treatment started on week 2. Nine weeks group support from smoking programme, NRT offered to all participants **Sample sizes:** 46 **Intervention n=** 24 **Control n=** 22 **Baseline comparisons:** **Study sufficiently powered?** 44% reduction in expired CO levels needed 10 participants per group, due to the open label nature of the intervention, then 20 participants per group	**Primary outcomes:** Sustained abstinence (weeks 10-14, bio-verified by CO<10ppm), point prevalence abstinence **Secondary outcomes:** Expired CO levels, urine cotinine levels, FTND **Follow-up periods:** 14 weeks **Method of analysis:** Fisher's exact test, ANCOVA (analysis of covariance), generalized estimating equations	**Primary outcomes:** No significant difference in sustained abstinence between the bupropion and placebo groups (18% versus 11%; p=0.67). Weekly point prevalence abstinence numerically favoured the bupropion group over the course of the trial; however, no statistically significant difference was detected (p=0.29). **Secondary outcomes:** No significant differences were seen between the treatment groups over the course of the trial for expired CO levels (p=0.54), FTND scores (p=0.16), or urinary cotinine levels (p=0.13) **Attrition details:** Drop outs were assumed to be non-abstinent, two dropped out of intervention group, neither received intervention; 3 dropped out of control group, 2 never received control, 1	**Limitations identified by author:** Lack of power from small sample size, **Limitations identified by team:** Short follow-up **Evidence gaps and/or recommendations for future research:** Not reported **Source of funding:** Veterans Afiars Capitol Network Mental Illness Research, Education and Clinical Center, National Institute of Mental Health grant, Advance Center for Intervention Services Research

		were recrutied		no longer met the inclusion criteria. Intention to treat analysis	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Williams **Year:** 2007 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** +	**Source population:** USA **Eligible population:** Not reported **Selected population:** Participants with schizophrenia or schizoaffective disorder who wanted to quit smoking **Excluded population:** Not reported **Setting:** Outpatients	**Method of allocation:** Unclear **Intervention description:** High dose NRT 42mg patch, for 8 weeks **Control description:** Regular dose NRT 21mg patch, for 8 weeks **Sample sizes:** 51 **Intervention n=** 25 **Control n=** 26 **Baseline comparisons:** No differences between treatment groups **Study sufficiently powered?** Unclear	**Primary outcomes:** Point prevalence abstinence (7 day) **Secondary outcomes:** Time to first relapse to smoking **Follow-up periods:** 8 weeks **Method of analysis:** Not reported	**Primary outcomes:** No significant difference in 7 day point prevalence abstinence between the high dose and standard dose treatment groups at 8 weeks (8/25 versus 6/26; p=0.48). **Secondary outcomes:** Time to first relapse back to smoking was reported to be not significantly different between the treatment groups **Attrition details:** Unclear	**Limitations identified by author:** Not reported **Limitations identified by team:** Insufficient information in abstract regarding population and methods, short follow-up, small sample size **Evidence gaps and/or recommendations for future research:** Not reported **Source of funding:** National Institute on Drug Abuse

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Williams **Year:** 2010 **Study design:** Randomised controlled trial **Quality score:** + **External validity:** ++	**Source population:** USA **Eligible population:** University of Medicine and Dentistry of New Jersey, mental health facility **Selected population:** DSM-IV criteria for schizophrenia or schizoaffective disorder, more than 10 cigarettes smoked per day, atypical antipsychotic medication, motivated to quit smoking **Excluded population:** Seriously cognitively impaired patients≥22 on Mini-Mental Status Examination, users of clonidine, bupropion, nortrypline, or any nicotine product, smoked cigars or other tobacco products, including smokeless tobacco **Setting:** Outpatients	**Method of allocation:** Adaptive urn randomisation procedure that accounts for motivation, gender, ethnicity, and heavy versus light smoking **Intervention description:** Behavioural counselling – Treatment of Addiction to Nicotine in Schizophrenia (TANS) – high intensity treatment of 24 sessions (45 minutes duration each), over 26 weeks **Control description:** Medication management (MM) – moderate intensity treatment of 9 sessions (20 minutes duration each), over 26 weeks **Further information:** Target quit date on week 5. All participants got NRT for 16 weeks (21mg for 12 weeks, decreasing to 14mg for 4 weeks). Received education and hand-outs about use and benefits of nicotine patch **Sample sizes:** 100 (87 analysed)	**Primary outcomes:** Continuous abstinence (bio-verified by CO<10ppm), point prevalence abstinence (7 day) **Secondary outcomes:** Time to first lapse to smoking **Follow-up periods:** 6 months **Method of analysis:** t test, chi-squared tests, stepwise logistic regression	**Primary outcomes:** No significant difference in continuous abstinence (bio-verified by CO) at 12 weeks after target quit date between the high intensity and medium intensity programmes (15.6% versus 26.2%; p=0.22). Similar non-significant findings were seen at 26 weeks post target quit date (p=0.67) and at one year (p=0.78). **Secondary outcomes:** No significant differences were seen from baseline to week 12 post target quit date between the high and medium intensity programmes for CO reduction (p=0.76) or the number of cigarettes smoked per day (p=0.35). A survival analysis assessing the time to first cigarette lapse was not significantly difference between the high and medium intensity programmes in a subset of 69 participants (mean 5.1 versus 6.3 days;	**Limitations identified by author:** Clinicians in trial were trained and delivered both TANS and MM treatments which could have blurred the distinction between the two treatments, NRT medication may have minimized the behavioural therapy differences **Limitations identified by team:** Different number of sessions, so difference may be due to number of contacts rather than content of sessions **Evidence gaps and/or recommendations for future research:** Testing individual versus group treatment approaches, longer term follow-up needed to see if initial success in maintained over time **Source of funding:** National Insititue on Drug Abuse, National Institute of Mental Health.

		Intervention n= 45 **Control n=** 42 **Baseline comparisons:** No differences between groups except for baseline expired CO levels (21.3 versus 16.6ppm) **Study sufficiently powered?** Based on estimate from literature of cessation outcomes in smokers with schizophrenia with medium effect size in abstinence rates		p=0.32) **Attrition details:** 13% did not attend any treatment and dropped out of the study	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors: Wojtna **Year:** 2009 **Study design:** Non-randomised trial **Quality score:** - **External validity:** +	**Source population:** Poland **Eligible population:** Not reported **Selected population:** Mentally ill heavy smokers (diagnoses included schizophrenia and depression) **Excluded population:** Not reported **Setting:** In-patients	**Method of allocation:** Unclear **Intervention description:** CBT, 12 weekly 2 hour therapeutic sessions concentrating on enhancing self-esteem, and 12 weekly educational sessions **Control description:** Education training sessions only (assume 12 weekly sessions) **Sample sizes:** 44 **Intervention n=** 19 **Control n=** 25 **Baseline comparisons:** Unclear **Study sufficiently powered?** No	**Primary outcomes:** Smoking abstinence **Secondary outcomes:** Self-reported number of cigarettes smoked per day **Follow-up periods:** 12 weeks **Method of analysis:** Unclear	**Primary outcomes:** Participants in the CBT group were significantly more likely to report stopping smoking compared to the education training only group (OR 3.64, 95% CI 1.04-12.80; p=0.04). **Secondary outcomes:** After treatment was completed, the study reported the CBT group smoked less than the education training only group **Attrition details:** Unclear	**Limitations identified by author:** Not reported in abstract **Limitations identified by team:** Lack of randomisation, lack of blinding, no intention to treat analysis, lack of information about population and methods **Evidence gaps and/or recommendations for future research:** Not reported **Source of funding:** Not reported

APPENDIX 8. COLLABORATORS

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SMOKING CESSATION IN MENTAL HEALTH SERVICES

Review 5: Barriers and Facilitators for Smoking cessation interventions in Mental Health

PRODUCED BY: UK Centre for Tobacco Control Studies (UKCTCS, http://www.ukctcs.org/)

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DATE: 3 December 2012

VERSION: Draft 3.0

November 2021: NICE guidelines PH45 (June 2013) and PH48 (November 2013) have been updated and replaced by NG209.
The recommendations labelled [2013] or [2013, amended 2021] in the updated guideline were based on these evidence reviews.
See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

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ACKNOWLEDGEMENTS

The review team would like to thank Irene Kwan from the EPPI-Centre, Institute of Education, University of London, and Professor Sarah Lewis from the UK Centre for Tobacco Control Studies, University of Nottingham, for their contributions to the work within the report. We would also like to thank the members of the PDG and the team at NICE for their comments.

FIGURES PAGE

EXECUTIVE SUMMARY

BACKGROUND

The strong relationship between smoking and severe mental illness, as well as the complexity of neurobiological, environmental and genetic factors contributing to it, are well recognised. Smoking prevalence among people diagnosed with a severe mental illness, such as schizophrenia, can reach 70% or more, by far exceeding prevalence in the general population (21%), and levels of tobacco dependency have also been found to be higher. Much of the excess mortality and morbidity in people with severe mental illness has been found to be associated with smoking related conditions, and rates of cardiovascular and respiratory diseases as well as cancers are increased compared to the general population. Although smoking has been identified as one of the major contributors to health inequalities in this population, smoking is still the norm in many mental health settings, and no best practice models for the provision of effective support in mental health settings have been identified.

AIM OF THE REVIEW

This systematic review aims to identify the factors that act as barriers or facilitators to implementing smoking cessation and temporary abstinence interventions, including strategies for referring people to stop smoking or hospital/unit based stop smoking services, from the perspectives of users and providers in mental health services.

QUESTIONS OF THE REVIEW

The review addressed the following key research questions:

- *What are the barriers and facilitators that affect the delivery of effective interventions, for example the interventions as identified in review 4?*
- *How can community, primary, and secondary care mental health care providers collaborate more effectively to integrate smoking cessation support within care pathways?*

Subsidiary questions included:

- *What are the views (knowledge, attitudes, and beliefs) of the populations of interest in mental health services (all patients, service users [including family, carers, and visitors]) who may use smoking cessation or temporary abstinence interventions?*
- *What are the views (knowledge, attitudes, and beliefs) of the service providers within the NHS stop smoking services and mental health staff within hospitals, outpatient clinics and the community, including intensive services in psychiatric units and secure hospitals?*
- *Are there differences in acceptability of smoking cessation and temporary abstinence interventions by deliverer, setting, timing (or point in the care pathway), frequency, duration, and severity of dependence?*
- *Are there differences in acceptability of smoking cessation and temporary abstinence interventions by mental health diagnosis, gender, sexual orientation, age, ethnicity, religion,*

socioeconomic status, disability, and population of interest (including patients, household members, visitors and staff)?

METHODS

A systematic review was conducted to address the questions of the review. A comprehensive search strategy of electronic databases, websites, and reference screening was performed, with searches being conducted in February 2012. We considered any qualitative or quantitative studies which included the following populations of interest of any age who smoked:

- All users of secondary care mental health services, including those who are in the process of being referred to or have recently been discharged from child, adolescent, adult or older people mental health services:
  - Inpatient, residential and long-term care for severe mental illness in hospitals, psychiatric and specialist units and secure hospitals
  - Patients who are within the care of specialist community-based multidisciplinary mental health teams
- People living in the same household as a mental health service user, such as partners, parents, other family members and carers
- Visitors to secondary care mental health setting who are not receiving treatment or care, such as relatives or friends of patients or service users
- Staff (including support staff, volunteers, agency/locum staff and staff employed by contractors) working in secondary care mental health settings, in particular those who have direct contact with patients and service users

We considered any barriers or facilitators (including knowledge, attitudes and beliefs) of using or implementing smoking cessation or temporary abstinence approaches. We included any pharmacological (including behavioural support, counselling and advice [with and without a pharmacological intervention]), psychological or self-help intervention that aimed to assist with smoking cessation or temporary abstinence. We also included any approaches used by, or with, mental health professionals/ mental health care providers/ the wider care team to increase recording, identification and/or referral to stop smoking services or mental healthcare-based stop-smoking services.

Two reviewers independently screened 10% of titles and abstracts, and full texts to ensure high agreements between reviewers. The remaining titles and abstracts, and full texts were then screened by one of the reviewers. 10% of the included studies were independently data extracted and quality assessed by two reviewers to ensure high agreement; then the remaining papers were extracted by one of the reviewers.

RESULTS

46 primary studies were included in the review. The majority of the included studies focused on the views, attitudes, and beliefs of staff, with smaller numbers of studies focusing on the views of patients. Only one study was identified that assessed the views of relatives and main caregivers. One publication detailed findings from the implementation of a tailored tobacco dependence treatment

service in mental health settings. Eighteen studies focused on inpatient settings, with a further 16 focusing on community based settings, nine focused on both settings, and the setting was unclear in the remaining three studies. The majority of the studies were conducted in the USA, with only 10 studies being conducted in the UK. The majority of studies used a survey based questionnaire design, with a further 12 studies using solely a qualitative design, and 6 using a mixed methods design. The majority of the studies were deemed to have medium quality, with similar numbers scoring high and low quality (12 and 11 studies, respectively).

Evidence Statements

Question 1a. What are the views (knowledge, attitudes, and beliefs) of the populations of interest in mental health services (all patients, service users [including family, carers, and visitors]) who may use smoking cessation or temporary abstinence interventions?

Evidence statements

Patients' views, attitudes and perceptions regarding smoking

ES 1.1 There is strong evidence to suggest inpatients and outpatients' perceived the reasons for smoking are: to gain autonomy **[Lawn 2002, Australia, Q++; Snyder 2008, USA, Q++]**; to relieve boredom **[Dickens 2005, England, S+; Goldberg 1996, Canada, MM++; Green 2005, Canada, Q+; Morris 2009, USA, Q+; Ratschen 2010b, England, Q++; Snyder 2008, USA, Q++; Tsourtos 2011, Australia, Q++]**; nicotine addiction **[Solty 2009, Canada, S+; Snyder 2008, USA, Q++; Goldberg 1996, Canada, MM++]**; pleasure and enjoyment **[Edmonds 2007, England, Q++; Goldberg 1996, Canada, MM++; Lawn 2002, Australia, Q++; Lucksted 2000, USA, Q++; Ratschen 2010b, England, Q++; Snyder 2008, USA, Q++]**; and to relax and calm down **[Green 2005, Canada, Q+; Morris 2009, USA, Q+; Ratschen 2010b, England, Q++; Snyder 2008, USA, Q++; Solty 2009, Canada, S+; Tsourtos 2011, Australia, Q++]**.

ES 1.2 There is strong evidence from Canada and England to suggest inpatients and outpatients perceive the need for alternative meaningful activities to replace smoking **[Goldberg 1996, Canada, MM++; Ratschen 2010b, England, Q++]**.

ES 1.3 There is strong evidence to suggest inpatients and outpatients smoke to give them a sense of companionship **[Lawn 2002, Australia, Q++; Snyder 2008, USA, Q++]** and as a form of social pastime **[Green 2005, Canada, Q+; Goldberg 1996, Canada, MM++; Lawn 2004, Australia, Q++; Morris 2009, USA, Q+; Snyder 2008, USA, Q++]**, particularly in residential care and inpatient settings where smoking was a major component of their interaction with other residents.

ES 1.4 There is strong evidence to suggest inpatients and outpatients report smoking as a form of self-medication to cope with symptoms of their mental illness **[Goldberg 1996, Canada, MM++; Lawn 2002, Australia, Q++; Dickens 2005, England, S++; Morris 2009, USA, Q+; Lucksted 2000, USA, Q++]**, and because they fear stopping may result in a deterioration in their illness **[Lawn 2002, Australia, Q++; Lawn 2004, Australia, Q++]**.

ES 1.5 There is strong evidence to suggest smoking was a major priority in the lives of inpatients and outpatients with mental illness **[Lawn 2002, Australia, Q++; Snyder 2008, USA, Q++; Tsourtos 2011, Australia, Q++]**.

ES 1.6 There is strong evidence to suggest inpatients and outpatients perceive staff use cigarettes as a mechanism of control in inpatients settings **[Lawn 2002, Australia, Q++; Lawn 2004, Australia, Q++; Lucksted 2000, USA, Q++]**, in particular using them as a reward or punishment in order to control the patient's behaviour **[Lawn 2002, Australia, Q++; Lucksted 2000, USA, Q++]**.

Applicability: The evidence has direct applicability to the current UK settings and/or practices. Three of the studies were conducted in the UK **[Dickens 2005, England, S+; Edmonds 2007, England, Q++; Ratschen 2010b, England, Q++]**, and a further three were conducted in a country which was deemed to have similar applicability to that of the UK setting **[Lawn 2002, Australia, Q++; Lawn 2004, Australia, Q++; Tsourtos 2011, Australia, Q++]**.

PATIENTS' VIEWS, ATTITUDES AND PERCEPTIONS REGARDING MAKING A QUIT ATTEMPT

ES 2.1 There is strong evidence to suggest inpatients and outpatients perceive nicotine addiction as a major barrier to making a quit attempt **[Dickens 2005, England, S+; Green 2005, Canada, Q+; Goldberg 1996, Canada, MM++; Snyder 2008, USA, Q++]**.

ES 2.2 There is strong evidence to suggest inpatients and outpatients consider they are unable to quit smoking, primarily related to a lack of motivation **[Goldberg 1996, Canada, MM++; Morris 2009, USA, Q+; Synder 2008, USA, ++]**. There was moderate evidence to suggest inpatients and outpatients perceive stress **[Tsourtos, 2011, Australia, ++]**, and the severity of their mental health symptoms **[Mikhailovich 2008, Australia, MM-; Tsourtos 2011, Australia, Q++]** as barriers to quitting smoking.

ES 2.3 There is moderate evidence to suggest several inpatients and outpatients perceived there was little point in quitting smoking as this would have no direct effect on their recovery from their mental illness **[Lawn 2002, Australia, Q++]**, improve their quality of life **[Ratschen 2010b, England, Q++]**, or health **[Snyder 2008, USA, Q++]**.

ES 2.4 There is strong evidence to suggest inpatients' and outpatients' perceive the influence of peer, family, and social pressure as important barriers to quitting, with patients perceiving it difficult to quit smoking when peers, family, and staff members smoke around them **[Dickens 2005, England, S++; Goldberg 1996, Canada, MM++; Morris 2009, USA, Q+]**.

ES 2.5 There is strong evidence to suggest outpatients perceive the negative views and beliefs of staff as important barriers to quitting smoking **[Green 2005, Canada, Q+; Lawn 2002, Australia, Q++; Lucksted 2000, USA, Q++]**.

ES 2.6 There is moderate evidence from the USA to suggest outpatients perceive they have a lack of knowledge regarding which strategies are effective for smoking cessation **[Morris 2009, USA, Q+; Lucksted 2000, USA, Q++]**; with outpatients requesting the need for structured patient education, which detailed relevant information about smoking cessation interventions, issues relating to

psychotropic medications and methods of minimising withdrawal symptoms **[Morris 2009, USA, Q+; Lucksted 2000, USA, Q++]**

ES 2.7 There is mixed evidence regarding the impact of the patients' physical health on quitting smoking, with strong evidence to suggest inpatients' and outpatients' with mental illness perceived worrying about their physical health was a facilitator to quitting smoking **[Dickerson 2011, USA, Q+; Goldberg 1996, Canada, MM++; Ratschen 2010b, England, Q++; Solty 2009, Canada, S+; Tidey 2009, USA, S-; Tsourtos 2011, Australia, Q++]**. However, there is moderate evidence to suggest that outpatients would need to experience a negative health effect of smoking before they would consider quitting **[Dickerson 2011, USA, Q+; Goldberg 1996, Canada, MM++]**.

ES 2.8 There is strong evidence to suggest inpatients' and outpatients' perceive the influence of peer, family, and social pressures to quit smoking as important facilitators to quit **[Goldberg 1996, Canada, MM++; Kelly 2010, USA, CC-; Snyder 2008, USA, Q++]**.

ES 2.9 There is strong evidence to suggest inpatients and outpatients perceive the high cost of cigarettes as a major facilitator to quitting smoking **[Dickerson 2011, USA, Q+; Goldberg 1996, Canada, MM++; Ratschen 2010b, England, Q++; Solty 2009, Canada, S+]**.

ES 2.10 There is moderate evidence to suggest outpatients' perceived they would need to have a positive attitude regarding the success of their quit during a quit attempt to maximise success **[Morris 2009, USA, Q+; Edmonds 2007, England, Q++]**.

Applicability: The evidence has direct applicability to the current UK settings and/or practices. Three of the studies were conducted in the UK **[Dickens 2005, England, S+; Edmonds 2007, England, Q++; Ratschen 2010b, England, Q++],** and a further three were conducted in a country which was deemed to have similar applicability to that of the UK setting **[Lawn 2002, Australia, Q++; Mikhailovich 2008, Australia, MM-; Tsourtos 2011, Australia, Q++]**.

PATIENTS' VIEWS, ATTITUDES AND PERCEPTIONS REGARDING SUCCESSFULLY QUITTING

ES 3.1 There is moderate evidence from Brazil and England to suggest inpatients' perceive NRT as not effective for smoking cessation **[Scherer unpublished, Brazil, MM+; Ratschen 2010b, England, Q++]**; however, there is moderate evidence from the UK and Canadian studies to suggest that some inpatients' perceived NRT to be the most beneficial intervention to help them quit smoking **[Dickens 2005, UK, S+; Ratschen 2010b, England, Q++; Solty 2009, Canada, S+]**. There is moderate evidence from England to suggest some inpatients would prefer not to take further medications than those they are already taking for their mental illness **[Ratschen 2010b, England, Q++]**.

ES 3.2 There is moderate evidence from Australia to suggest outpatients perceived the cost was a barrier to using NRT for smoking cessation **[Lawn 2002, Australia, Q++]**; and moderate evidence from England to suggest outpatients were not aware that NRT could be received on prescription and so would have been free for those entitled to free prescriptions **[Edmonds 2007, England, Q++]**.

ES 3.3 There is moderate evidence from England to suggest that outpatients perceived the group format for behavioural therapy would not be as effective as using an individual (one-to-one) format **[Edmonds 2007, England, Q++]**.

ES 3.4 There is moderate evidence from England to suggest that inpatients perceived providing smoking cessation support in a hospital inpatient setting would not be the most suitable environment **[Ratschen 2010b, England, Q++]**.

ES 3.5 There is moderate evidence to suggest outpatients would have found the option of using behavioural support interventions useful during their quit attempts **[Dickerson 2011, USA, Q+; Edmonds 2007, England, Q++]**.

ES 3.6 There is moderate evidence from England and the USA to suggest outpatients who had successfully quit perceived the following as important facilitators to successfully quitting: i) being able to dictate how many sessions of behavioural support they received **[Edmonds 2007, England, Q++]**, ii) the option to have the support in an informal and non-clinical environment **[Edmonds 2007, England, Q++]**, iii) receiving cessation support that is tailored to their needs as patients with mental illness **[Edmonds 2007, England, Q++]**, and iv) having the support involve either one or more persons with a history of mental illness who had successfully quit smoking **[Dickerson 2011, USA, Q+; Morris 2009, USA, Q+]**.

ES 3.7 There is moderate evidence from England and the USA to suggest that outpatients perceive having a supportive smoking cessation advisor is an important facilitator to successfully quitting **[Edmonds 2007, England, Q++; Morris 2009, USA, Q+]**. In particular, they described the importance that the smoking cessation advisor should i) take a non-judgmental approach to quitting **[Edmonds 2007, England, Q++]**, whilst being able to maintain a positive expectation in the patient's ability to quit smoking **[Morris 2009, USA, Q+]**, ii) act as an advocate during the quit attempt **[Edmonds 2007, England, Q++]**, and iii) have a good knowledge of mental health problems, and how smoking and quitting can impact on their mental health **[Edmonds 2007, England, Q++]**.

ES 3.8 There is moderate evidence from Canada and the USA to suggest outpatients perceive monetary incentives could be an effective intervention for smoking cessation **[Goldberg 1996, Canada, MM++; Kelly 2010, USA, CC-]**.

ES 3.9 There is moderate evidence to suggest some inpatients' and outpatients' perceive they would find it easier to achieve success if their goal was to cut down on their smoking rather than aiming for complete smoking cessation **[Lawn 2002, Australia, Q++; Ratschen 2010b, England, Q++]**.

ES 3.10 There is weak evidence to suggest inpatients' and outpatients' perceived quitting smoking resulted an improvement in communication with others and in forming new peer groups **[Edmonds 2007, UK, ++; Mikhailovich 2008, Australia, MM-]**.

Applicability: The evidence has direct applicability to the current UK settings and/or practices. Three of the studies were conducted in the UK **[Dickens 2005, England, S+; Edmonds 2007, England, Q++; Ratschen 2010b, England, Q++]**, and a further two studies were conducted in a country which was

deemed to have a similar applicability to the UK setting **[Lawn 2002, Australia, Q++; Mikhailovich 2008, Australia, MM-].**

Question 1b. What are the views (knowledge, attitudes, and beliefs) of the service providers within the NHS stop smoking services and mental health staff within hospitals, outpatient clinics and the community, including intensive services in psychiatric units and secure hospitals?

EVIDENCE STATEMENTS

STAFF ATTITUDES AND BELIEFS REGARDING SMOKING IN PATIENTS

ES 4.1 There is strong evidence to suggest that clinical and non-clinical staff mental health staff in inpatient and outpatient settings believe tobacco use is a personal choice of the patient **[Ashton 2010, Australia, S+; Dickens 2004, England, S+; Essenmacher 2008, USA, MM+; Lawn 2004, Australia, Q++; Lawn 2006, Australia, Q++; Williams 2009, USA, S+]**. There is moderate evidence to suggest ward staff in inpatient and outpatient settings perceived that patients experience enjoyment from smoking and use cigarettes as a coping mechanism, and as a means of self-medication to control mental illness symptoms **[Ratschen 2009b, England, Q+; Lawn 2006, Australia, Q++]**. There is moderate evidence to suggest that ward staff and mental health administrators in inpatient and outpatient settings perceive cigarettes to fulfill an especially important function in the lives of patients with mental illness **[Morris 2009, USA +; Ratschen 2009a, England, S++]**.

ES 4.2 There is strong evidence from Australia and the USA to suggest nursing and mental health ward staff, and mental health administrators perceive cigarettes are used as a form of currency or means of control to achieve compliance in inpatients with mental health conditions **[Lawn 2004, Australia, Q++; Lawn 2006, Australia, Q++; Morris 2009, USA, Q+]**; and there is strong evidence to suggest nursing and ward staff and unit administrators perceive cigarettes are used to develop a rapport with inpatients **[Lawn 2004, Australia, Q++; Wye 2010, Australia, S++]**.

ES 4.3 There is strong evidence from Australia and England to suggest nursing and mental health ward staff from predominately inpatient settings believe allowing patients to continue to smoke in hospital, as opposed to withdrawing the provision through banning smoking, will reduce the likelihood of aggression and violence, thereby ensuring a smoother running of an inpatient setting **[Lawn 2004, Australia, Q++; Lawn 2006; Australia, Q++; Stubbs 2004, England, S+]**.

Applicability: Most of the evidence has direct applicability to the current UK settings and/or practices. Four studies were conducted in the UK **[Dickens 2004, England, S+; Ratschen 2009a, England, S++; Ratschen 2009b, England, Q+; Stubbs 2004, England, S+]**, and a further four studies were conducted in countries which were deemed to have similar applicability to that of the UK setting **[Lawn 2006, Australia, Q++; Ashton 2010, Australia, S+; Lawn 2004, Australia, Q++; Wye 2010, Australia, S++]**.

STAFF ATTITUDES TOWARDS SMOKING CESSATION IN PATIENTS

ES 5.1 There is strong evidence to suggest that psychiatrists and nursing staff members and mental health managers from inpatient and outpatient settings have the misconception that patients with mental health conditions are unable to stop smoking **[Edmonds 2007, England, Q++; Lawn 2004, Australia, Q++; Morris 2009, USA, Q+; Price 2007a, USA, S-; Price 2007b, USA, S+; Sharp 2009, USA, S+; Stubbs 2004, England, S+; Wye 2010, Australia, S++]**.

ES 5.2 Despite the evidence that staff believe patients with mental health conditions are unable to stop smoking, there is strong evidence to suggest that clinical and non-clinical mental health staff from inpatient and outpatient settings feel patients' smoking should be addressed **[Ashton 2010, Australia, S+; O'Donovan 2009, Republic of Ireland, S+; Price 2007a, USA, S-; Sharp 2009, USA, S+; Sidani 2011, USA, S+; Tong 2010, USA, S+; Weinberger 2008, USA, S-]**, and moderate evidence that they should have the option to stop smoking if they so wished **[Ashton 2010, Australia, S+]**. There is moderate evidence to suggest that some ward staff, psychiatrists and general practitioners, and mental health administrators from inpatient and outpatient settings actively discourage patients from quitting **[Lubman 2006, Australia, S-; Morris 2009, USA, Q+; Ratschen 2009b, England, Q+]**.

ES 5.3 There is strong evidence to suggest that the smoking status of nurses, ward staff and non-clinical staff predominately from inpatient settings is a barrier to providing and supporting smoking cessation, where smokers are more likely to have negative views about smoking cessation and reduction **[Dickens 2004, England, +; Edmonds 2007, England, Q++; Essenmacher 2008, USA, MM+; Lawn 2004, Australia, Q++; Prochaska 2005, USA, S+; Sarna 2009, USA, S-]**. Additionally, there is weak evidence to suggest mental health administrators from outpatient settings perceive the overt use of tobacco by staff members was a barrier to patients' quitting smoking **[Morris 2009, USA, Q+]**. Furthermore, there was weak evidence to suggest clinical and non-clinical staff perceived that smoking cessation support for staff members to assist them to quit smoking should be provided in inpatient settings **[Essenmacher 2008, USA, MM+]**.

ES 5.4 The evidence is mixed regarding the beliefs of whether staff thought providing smoking cessation was part of their role, with strong evidence from four studies to suggest that the majority of psychiatrists and clinical and non-clinical mental health workers from inpatient and outpatient settings did not feel that providing smoking cessation support was part of their role **[Ashton 2010, Australia, S+; Essenmacher 2008, USA, MM+; Price 2007b, USA, S+; Ratschen 2009a, England, S++]**. However, there is weak evidence from one study of psychiatrists and practice nurses from inpatient and outpatient settings to suggest it should be part of their role **[Williams 2009, USA, S+]**. Furthermore, there is weak evidence to suggest community based psychiatrists perceived patients had a preoccupation with other health or medical complaint, and thus smoking cessation would not be a priority for patients **[Price 2007a, USA, S-; Price 2007b, USA, S+]**.

ES 5.5 There is moderate evidence to suggest that clinical and non-clinical mental health staff from inpatient settings perceive quitting smoking would have a detrimental effect on the mental health symptoms of the patient **[Dickens 2004, England, S+; Lawn 2004, Australia, Q++; Scherer unpublished, Brazil, MM+; Sidani 2011, USA, S+; Stubbs 2004, England, S+]**.

ES 5.6 There is very weak evidence from the USA to suggest that mental health professionals perceive the impact of smoking cessation on the effectiveness of medical therapy for mental

illnesses is a barrier to implementing smoking cessation support in patients (setting unclear) **[Landow 1995, USA, S-]**.

Applicability: Most of the evidence has direct applicability to the current UK settings and/or practices. Five studies were conducted in the UK **[Dickens 2004, England, S+; Edmonds 2007, England, Q++; Ratschen 2009a, England, S++; Ratschen 2009b, England, Q+; Stubbs 2004, England, S+]**, and a further five studies were conducted in countries which were deemed to have similar applicability to that of the UK setting **[Ashton 2010, Australia, S+; O'Donovan 2009, Republic of Ireland, S+; Lawn 2004, Australia, Q++; Lubman 2006, Australia, S-; Wye 2010, Australia, S++]**.

Perceived barriers and facilitators to quitting in patients

ES 6.1 There is moderate evidence to suggest clinical mental health staff and administrators from inpatient and outpatient settings perceived boredom, increased stress, tobacco dependence, and a lack of motivation as barriers to quitting smoking in patients with mental illness **[Ashton 2010, Australia, S+; Morris 2009, USA, Q+; Sharp 2009, USA, S+]**.

ES 6.2 There is moderate evidence to suggest ward staff from an inpatient setting thought a lack of activities was a barrier for patients' quitting smoking **[Lawn 2004, Australia, Q++; Ratschen 2009b, England, Q+]**, and there was weak evidence to suggest that clinical and non-clinical staff from an inpatient setting perceived that introducing meaningful activities would act as a facilitator for smoking cessation **[Essenmacher 2008, USA, MM+]**.

ES 6.3 There is moderate evidence to suggest mental health staff and administrators from inpatient and outpatient settings thought social isolation was a barrier for patient's quitting smoking **[Ashton 2010, Australia, S+; Morris 2009, USA, Q+]**.

ES 6.4 There is recent evidence to suggest that factors related to motivation and attention can pose barriers to engaging with and retaining particularly inpatients in a tobacco dependence service **[Parker 2012, England, MM+]**.

Applicability: The majority of the evidence has direct applicability to the current UK settings and/or practices. Two studies were conducted in the UK **[Parker 2012, England, MM+; Ratschen 2009b, England, Q+]**, and a further two studies were conducted in a country which was deemed to have similar applicability to that of the UK setting **[Ashton 2010, Australia, S+; Lawn 2004, Australia, Q++]**.

Staff skills and abilities

ES 7.1 There was strong evidence to suggest that psychiatrists, ward staff, psychiatric nurses and mental health counsellors from inpatient and outpatient settings felt a lack of confidence in providing smoking cessation support to patients with mental health conditions **[Price 2007a, USA, S-; Price 2007b, USA, S+; Prochaska 2005, USA, S+; Ratschen 2009a, England, S++; Sharp 2009, USA, S+; Sidani 2011, USA, S+]**, even though some staff felt knowledgeable regarding the harms of

smoking and stop smoking strategies. There was moderate evidence to suggest education in one-to-one services resulted in mental health professionals from a community setting feeling more confident to provide smoking cessation support to patients with mental health conditions **[Edmonds 2007, England, Q++].**

ES 7.2 There was strong evidence to suggest that a lack of training during their education and whilst in post was directly responsible for the lack of preparedness that clinical and non-clinical staff from inpatient and outpatient settings felt towards implementing smoking cessation strategies **[Essenmacher 2008, USA, MM+; O'Donovan 2009, Republic of Ireland, S+; Price 2007a, USA, S-; Price 2007b, USA, S+; Prochaska 2005, USA, S+; Secker-Walker 1994, USA, S+; Sharp 2009, USA, S+; Sidani 2011, USA, S+; Tong 2010, USA, S+; Williams 2009, USA, S+; Zvolensky 2005, USA, S-]**.

ES 7.3 There was moderate evidence from one large UK survey to suggest clinical mental health professionals from an inpatient setting had a lack of knowledge regarding the prevalence of smoking and tobacco addiction in patients with mental illness, and half of the respondents lacked any formal training in smoking cessation **[Ratschen 2009a, England, S++]**.

ES 7.4 There was strong evidence to suggest that mental health professionals and administrators from inpatient and outpatient settings described that more training in smoking cessation would be helpful **[Edmonds 2007, England, Q++; Morris 2009, USA, Q+; O'Donovan 2009, Republic of Ireland, S+]**, in particular it was suggested that the training should be located onsite using user-friendly, manualised tools and should contain information regarding how best to approach mental health patients, the harms of smoking versus the potential benefits of symptom control **[Morris 2009, USA, Q+]**, and the impact smoking reduction and cessation can have on some medications **[Ratschen 2009b, England, Q+]**. There was moderate evidence to suggest including the treatment of nicotine dependence, with relevant clinical experiences (such as leading smoking cessation groups) in the curriculum of residency programmes would facilitate providing smoking cessation support for patients with mental health conditions **[Prochaska 2006, USA, S+]**. Additionally, there was weak evidence to suggest that mental health administrator staff perceived a positive expectation of success at quitting would be an essential component of a successful smoking cessation training package **[Morris 2009, USA, Q+]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Three studies were conducted in the UK **[Edmonds 2007, England, Q++; Ratschen 2009a, England, S++; Ratschen 2009b, England, Q+]**, and a further two studies were conducted in countries which were deemed to have similar applicability to that of the UK setting **[O'Donovan 2009, Republic of Ireland, S+; Wye 2010, Australia, S++]**.

Staff perceptions of systems and policies

ES 8.1 There is strong evidence to suggest clinical and non-clinical mental health professionals and administrators predominately from outpatient settings perceive the lack of prioritising smoking cessation support either in the mental health service or as part of the staff's workload was a major barrier to offering stop smoking support **[Edmonds 2007, England, Q++; Morris 2009, USA, Q+; Price 2007b, USA, S+; Prochaska 2006, USA, S+; Sharp 2009, USA, S+; Williams 2009, USA, S+]**.

ES 8.2 There is weak evidence to suggest that service managers from outpatient settings perceived the lack of setting targets for treating patients with mental health conditions within services in the UK is a barrier to delivering stop smoking support to these patients **[McNally 2010, England, MM+]**.

ES 8.3 There is strong evidence to suggest that clinical and non-clinical mental health professionals from inpatient and outpatient settings perceive that they are not able to dedicate sufficient time to provide smoking cessation support during their role due to conflicting priorities **[Ashton 2010, Australia, S+; Edmonds 2007, England, Q++; Essenmacher 2008, USA, MM+; O'Donovan 2009, Republic of Ireland, S+; Price 2007a, USA, S-; Price 2007b, USA, S+; Ratschen 2009a, England, S++; Sidani 2011, USA, S+; Williams 2009, USA, S+]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Three studies were conducted in the UK **[Edmonds 2007, England, Q++; McNally 2010, England, MM+; Ratschen 2009a, England, S++]**, and a further two studies were conducted in countries which were deemed to have similar applicability to that of the UK setting **[Ashton 2010, Australia, S+; O'Donovan 2009, Republic of Ireland, S+]**.

STAFF PERCEPTIONS REGARDING INTERVENTIONS FOR SMOKING CESSATION IN PATIENTS

ES 9.1 There is strong evidence from the USA and Brazil to suggest that mental health service staff and psychiatrists from inpatient and outpatient settings perceived NRT was not effective in mental health populations for smoking cessation **[Morris 2009, USA, Q+; Price 2007b, USA, S+; Scherer unpublished, Brazil MM+; Sidani 2011, USA, S+]**. There is weak evidence from one USA study to suggest that community based psychiatrists considered the safety of NRT use in adolescents and children with mental health conditions was a major barrier to using NRT for smoking cessation **[Price 2007b, USA, S+]**. There was moderate evidence from England to suggest non-medical inpatient staff were more likely to, incorrectly, believe addiction to NRT was common, compared to medical inpatient staff **[Ratschen 2009a, England, S++]**. Finally, there is recent evidence to suggest that staff had concerns regarding the 'harmful effect' and expense to the Trust of NRT **[Parker 2012, England, MM+]**.

ES 9.2 There is weak evidence from the USA to suggest community based psychiatrists were not prescribing NRT in their service due to their perception that smokers with mental health conditions would not comply with NRT **[Price 2007a, USA, S-; Price 2007b, USA, S+]**, and moderate evidence from England to suggest it is because inpatient mental health staff believed NRT interfered with antipsychotic medications **[Ratschen 2009a, England, S++]**.

ES 9.3 There is mixed weak evidence regarding whether clinical mental health staff's lack of awareness of smoking cessation services was a barrier to providing smoking cessation support in patients with mental health conditions in inpatient and outpatient settings **[Williams 2011, Review, -; Price 2007a, USA, S-; Weinberger 2008, USA, S-]**.

ES 9.4 There is strong evidence from US studies to suggest that clinical mental health staff and administrators predominately from outpatient settings thought a major barrier to providing smoking cessation support in patients with mental health conditions was the lack of resources and re-

imbursement for smoking cessation interventions from the state **[Morris 2009, USA, Q+; Price 2007b, USA, S+; Sidani 2011, USA, S+; Tong 2010, USA, S+]**.

ES 9.5 There is moderate evidence to suggest that nurses and mental health professionals predominately from inpatient settings perceive that the patients had a lack of information and support relating to smoking cessation support **[Ashton 2010, Australia, S+; Dickens 2004, England, S+]**, and addressing this would be a facilitator for smoking cessation and reduction **[Ashton 2010, Australia, S+; Ratschen 2009b, England, Q+]**. Additionally, there is very weak evidence to suggest that a major barrier to accessing smoking cessation services was a lack of access to a telephone or internet **[Williams 2011, Review, -]**.

ES 9.6 There is moderate evidence from Australia to suggest that the following factors were the psychiatric unit managers perceptions for whether a patient received treatment for nicotine dependence: i) whether the patient requested assistance to quit, ii) whether the patient was receptive to receiving interventions for smoking cessation, iii) whether an improvement in the patient's health would be seen with quitting , iv) whether the interventions were perceived to be effective, and v) the availability of NRT on the psychiatric unit **[Wye 2010, Australia, S++]**. There is moderate evidence from England to suggest that inpatient mental health staff perceive NRT products and behavioural support for smoking cessation and reduction were readily available in their inpatients mental health setting **[Ratschen 2009a, England, S++]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Three studies were conducted in the UK **[Dickens 2004, England, S+; Parker 2012, England, MM+; Ratschen 2009a, England, S++]**, and two studies were conducted in a country which was deemed to have similar applicability to that of the UK setting **[Ashton 2010, Australia, S+; Wye 2010, Australia, S++]**. However, the evidence relating to the lack of resources and re-imbursement as a barrier for providing smoking cessation interventions is likely not to be applicable to the UK setting and/or practices.

Subsidiary question: Are there differences in acceptability of smoking cessation and temporary abstinence interventions by deliverer, setting, timing (or point in the care pathway), frequency, duration, and severity of dependence?

EVIDENCE STATEMENT

ES 10.1 No evidence was identified which assessed the differences in acceptability of smoking cessation and temporary abstinence interventions by deliverer, timing (or point in care pathway), frequency, duration or severity of dependence.

Subsidiary question: Are there differences in acceptability of smoking cessation and temporary abstinence interventions by mental health diagnosis, gender, sexual orientation, age, ethnicity,

religion, socioeconomic status, disability, and population of interest (including patients, household members, visitors and staff)?

EVIDENCE STATEMENTS

ES 11.1 No evidence was identified which assessed the differences in acceptability of smoking cessation and temporary abstinence interventions by gender, sexual orientation, ethnicity, religion, socioeconomic status or disability.

ES 11.2 There is moderate evidence from Australia to suggest outpatients with schizophrenia or depression use cigarettes to overcome their fears of mental illness relapse **[Lawn 2002, Australia, Q++]**. Outpatients with schizophrenia exhibit overt behaviours to ensure their cigarette supply continues (for example, stealing cigarettes), whereas outpatients with depression appeared to have better coping strategies to ensure their supply lasted until they have sufficient funds to purchase more. Outpatients with personality disorders have an unconscious need to smoke when they are unwell and were shown to exhibit risky behaviours to ensure their supply continues **[Lawn 2002, Australia, Q++]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. None of the studies were conducted in the UK**;** however, one study was conducted in a country which was deemed to have similar applicability to that of the UK setting **[Lawn 2002, Australia, Q++]**.

Question 2. Which strategies/approaches are effective in encouraging mental health care professionals to record smoking status?

EVIDENCE STATEMENTS

ES 12.1 There is mixed evidence regarding whether patients are regularly asked about their smoking behaviour, with moderate evidence from the USA to suggest mental health staff from inpatient and outpatient settings regularly ask the smoking status of patients with mental illness **[Price 2007a, USA, S-; Price 2007b, USA, S+; Sarna 2009, USA, S-; Sharp 2009, USA, S+; Tong 2010, USA, S+; Williams 2009, USA, S+]**, but moderate evidence from Australia to suggest it is at the discretion of the mental health staff member in an inpatient setting whether they ask the smoking behaviour of their patients **[Wye 2009, Australia, S++]**. Additionally, there is moderate evidence from the USA to suggest a substantial proportion of mental health staff predominately from outpatient settings never document the smoking status of patients with mental illness **[Price 2007a, USA, S-; Price 2007b, USA, S+; Sidani 2011, USA, S+; Zvolensky 2005, USA, S+]**, but moderate evidence to suggest it is at the discretion of the mental health staff member in an inpatient setting whether they document the smoking behaviour of their patients **[Wye 2009, Australia, S++]**. There is recent evidence from the UK to suggest that whilst measures may be in place for inpatients to record and provide treatment for smoking, this may not be the case for community based patients **[Parker 2012, England, MM+]**.

ES 12.2 There is moderate evidence from the USA to suggest routine systems are used to identify patients who smoked predominately from outpatient settings, including consulting the patients' chart **[Secker-Walker 1994, USA, S+; Zvolensky 2005, USA, S-]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Only one of the studies was conducted in the UK **[Parker 2012, England, MM+]** and one study was conducted in a country which was deemed to be similar to that of the UK setting **[Wye 2009, Australia, S++]**.

Question 3a. Which strategies/approaches used by secondary care mental health services are effective for: Providing people from the population of interest with smoking cessation information, advice and support?

EVIDENCE STATEMENTS

ES 13.1 There is moderate evidence to suggest that psychiatrists and psychiatric nurses based in the US from inpatient and outpatient settings regularly provide their patients with smoking cessation advice **[Price 2007a, USA, S-; Sharp 2009, USA, S+; Tong 2010, USA, S+; Williams 2009, USA, S+]**; however, low rates of providing advice on smoking cessation were seen in a number of studies **[Ashton 2010, USA, S+; Essenmacher 2008, USA, S+; Parker 2012, England, MM+; Price 2007b, USA, S+; Prochaska 2005, USA, S+; Sarna 2009, USA, S-; Secker-Walker 1994, USA, S+; Sidani 2011, USA, S+; Solty 2009, Canada, S+]**.

ES 13.2 There is weak evidence from the USA to suggest psychiatric nurses, psychiatry residents, and medical health counsellors predominately from inpatient settings infrequently followed up regarding smoking cessation support for their patients **[Prochaska 2005, USA, S+; Sarna 2009, USA, S-; Sidani 2011, USA, S+]**.

ES 13.3 There is weak evidence from the USA to suggest inpatient and outpatient based psychiatrists regularly discuss pharmacotherapies **[Tong 2010, USA, S+]**, and community based psychiatrists infrequently prescribe smoking cessation pharmacotherapies **[Price 2007a, USA, S+]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Only two of the studies were conducted in the UK **[Parker 2012, England, MM+; Ratschen 2010b, England, Q++]**, and no further studies were conducted in a country which was deemed to be similar to that of the UK setting.

Question 3b. Which strategies/approaches used by secondary care mental health services are effective for: Referring people from the population of interest to stop smoking or hospital based stop smoking services?

EVIDENCE STATEMENTS

ES 14. 1 There is moderate evidence to suggest that in the US approximately half of mental health staff from inpatient and outpatient settings refer their patients to stop smoking services **[Sharp 2009, USA, S+; Tong 2010, USA, S+; Williams 2009, USA, S+]**, and weak evidence from the USA to suggest that inpatient and outpatient based psychiatric nurses are more likely to refer their patients if they are more highly motivated, valued tobacco dependence interventions, and perceived their patients to be more motivated to stop smoking **[Sharp 2009, USA, S+]**.

ES 14. 2 There is recent evidence from the UK to suggest that virtually no inpatients are referred to a NHS Stop smoking Service **[Parker 2012, England, MM+]**, and NHS Stop Smoking Services never or rarely receive referrals from inpatients with mental illnesses **[McNally 2010, England, MM+]**.

ES 14. 3 There is weak evidence to suggest the mental health status of clients attending stop smoking services in the UK is not known **[McNally 2010, England, MM+]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Two of the included studies were conducted in the UK **[McNally 2010, England, MM+; Parker 2012, England, MM+]**.

Question 4. How can community, primary, and secondary care mental health care providers collaborate more effectively to integrate smoking cessation support within care pathways?

EVIDENCE STATEMENTS

ES 15. 1 There was weak evidence from one UK study to suggest that ward staff perceived smoking cessation should be integrated into the inpatient based health care plan of the patient, and strong collaborations should be formed between key workers and doctors during the inpatient stay, and between inpatient and community teams **[Ratschen 2009b, England, Q+]**.

ES 15. 2 There was weak evidence from one UK study to suggest that ward staff perceived smoking cessation and smoking reduction should be tailored to the needs of the inpatients with mental illness, with support being provided through local stop smoking services **[Ratschen 2009b, England, Q+]**.

ES 15.3 There was weak evidence from the USA to suggest that community based mental health administrator staff perceived a useful facilitator for implementing smoking cessation across practices would be to first adopt smoking cessation support only in the practices in which there was a strong interest in smoking cessation, so that an early success could be demonstrated; rather than enforcing all practices to have smoking cessation support **[Morris 2009, USA, Q+]**.

ES15.4 There was recent evidence from the UK to suggest that implementing a tailored tobacco dependence service in the UK's largest mental health trust through the development of an

integrated smoking care pathway, whilst offering flexible support for smoking cessation and reduction programmes through the use of dedicated staff to provide the service, resulted in a modest service uptake rate overall. However, in the inpatient setting, where smokers can be easily identified due to smoking status recording being mandatory, almost a quarter of all smokers engaged with the service.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Two studies were conducted in a UK setting **[Parker 2012, England, MM+; Ratschen 2009b, England, Q+]**, therefore the evidence from these studies is likely to be directly applicable.

DISCUSSION

This review of the barriers and facilitators of smoking cessation in secondary mental health services comprises of a large body of evidence. Forty-six primary evidence studies, two discussion pieces, and one critical review were included in this review. The majority of the studies assessed the views, attitudes and beliefs of staff members, with fewer focusing on the views of patients, and only one study was identified which focused on the views of relatives and main caregivers. The majority of studies were conducted in the United States, with nine studies from the UK. The methodological quality of the studies was very variable, with few studies being awarded the highest score.

Overall the evidence suggests:

- Inpatients' and outpatients' perceive the following are reasons for smoking:
    - To gain autonomy
    - Nicotine addiction
    - Pleasure and enjoyment
    - Relaxation and to calm down
    - Sense of companionship and form of social pastime
    - Self-medication to cope with symptoms of mental illness, with patients' fearing quitting might result in deterioration.

- Patients' perceive cigarettes are used as a mechanism of control in inpatient settings.

- Inpatients' and outpatients' perceive nicotine addiction, lack of motivation, stress, severity of mental health symptoms, smoking in peers, family and staff, are barriers to making a quit attempt. Additionally, outpatients perceive a lack of knowledge regarding which strategies are effective for smoking cessation, and the negative views of staff, are important barriers to making a quit attempt.
- Inpatients' and outpatients' perceive worrying about their physical health, influence of peer, family and social pressures to quit, high cost of cigarettes, are facilitators to quitting smoking, with some outpatients expressing that they would need to experience a negative health effect before making a quit attempt. However, some inpatients' and outpatients' perceive there is little point in quitting as it would not have a direct effect on recovery from their mental illness, improve quality of life or health.

- Mixed beliefs were expressed by inpatients' regarding whether NRT was effective for smoking cessation; and some inpatients' expressed that they would prefer to not take further medications beyond those already taking for their mental illness. Additionally, cost of NRT was a barrier to using NRT in outpatients; however, patients were not aware that NRT could be acquired on prescription and so would have been free to those entitled to free prescriptions.
- Outpatients' perceived the offer of behavioural support would be useful during their quit attempt, however, they perceived group behavioural therapy would not be as effective an individual behavioural therapy.
- Outpatients perceived the following to be important facilitators to successfully quitting using behavioural support: being able to dictate how many sessions were received, ability to have support offered in informal and non-clinical setting, receiving support tailored to the needs of patients with mental illness, and involving one or more persons with a history of mental illness who had successfully quit smoking.
- Outpatients' perceived the smoking cessation advisor should be supportive, take a non-judgmental approach to quitting, maintain a positive expectation in the patients' ability to quit, act as an advocate during the quit attempt, and have a good knowledge of mental health problems, and how smoking and quitting can impact on their mental health.
- Inpatients' perceived that an inpatient setting was not a suitable environment for initiating smoking cessation support.
- Outpatients' perceive monetary incentives could be an effective intervention for smoking cessation. Inpatients' and outpatients' perceived they would find it easier if the goal was to cut down rather than quit.

- Staff in general believe that smoking is a patient choice and they perceive benefits to smoking such as patients enjoying smoking, using smoking as a coping mechanism, and as a means of self-medication to control mental illness symptoms. They believe that allowing patients to smoke reduces the likelihood of aggression and violence, thereby ensuring a smoother running of inpatient settings. However staff also perceived cigarettes were used as a form of currency or means of control to achieve compliance and develop a rapport with patients.

- Staff, from inpatient and outpatient settings, have the misconception that patients with mental health conditions are not able to stop smoking; with some staff from inpatient and outpatient settings actively discouraging patients from quitting. However, other staff, from inpatient and outpatient settings, felt that the patients should have their smoking addressed.
- The smoking status of the staff, predominately from inpatient settings, was a barrier to providing smoking cessation support, where smokers were more likely to have negative views about smoking cessation and reduction. The overt use of tobacco by staff members was perceived as a barrier to patients' quitting smoking.

- There were mixed beliefs regarding whether staff thought providing smoking cessation was part of their role, with the majority of staff from inpatient and outpatient settings feeling that it was not part of their role.
- Community based psychiatrists perceived patients had a preoccupation with other health or medical complaints, and thus smoking cessation would not be a priority for patients.
- Staff from inpatient settings perceived quitting smoking would have a detrimental effect on the mental health symptoms of the patient, and mental health professionals were worried about the effect of quitting smoking on the effectiveness of the patients' medication for mental illnesses.

- Staff perceived barriers to quitting in patients are boredom; increased stress; tobacco dependence; a lack of motivation; social isolation; and a lack of alternative activities were barriers to quitting smoking in patients with mental illness.
- Difficulties in engaging with and retaining patients in a tobacco dependence service were sometimes encountered and ascribed to factors relating to motivation and attention.

- Many staff lacked formal training in smoking cessation. Staff felt a lack of confidence in providing smoking cessation support to patients with mental health conditions resulting from a lack of training during their education and whilst in post, with education in behavioural support increasing confidence**.** Furthermore, staff described wanting more training in smoking cessation.

- Staff, predominately from outpatient settings, perceived the lack of prioritising smoking cessation support either in the mental health service or as part of the staff's workload, and the lack of setting targets for treating patients, were major barriers to offering stop smoking support.
- Staff, from inpatient and outpatient settings, perceived that they are not able to dedicate sufficient time to provide smoking cessation support during their role due to conflicting priorities.

- Staff, from inpatient and outpatient settings, perceived NRT was not effective in mental health populations for smoking cessation. Community based psychiatrists considered the safety of NRT use in adolescents and children with mental health conditions was a major barrier to using NRT for smoking cessation. Compliance with medication regimen, and a worry regarding whether NRT interfered with antipsychotic medications, were barriers to using NRT. Smoking cessation advisors reported staff had concerns regarding the 'harmful effect' and expense to the Trust of NRT

- Staff, predominately from outpatient settings in the US, thought a major barrier to providing smoking cessation support in patients with mental health conditions was the lack of resources and re-imbursement for smoking cessation interventions from the state.

- Staff, predominately from inpatient settings, perceived patients had a lack of information and support relating to smoking cessation support.

- Staff from the US, based on inpatient and outpatient settings, regularly asked the smoking status of patients with mental illness. Staff described routine systems were used to identify patients who smoked predominately from outpatient settings, including consulting the patients' chart; however, a substantial proportion of staff, predominately from outpatient settings, never document the smoking status of patients with mental illness.
- An audit from the UK identified whilst recording of smoking status was mandatory for inpatients, there was no such requirement for community based patients in a large Trust

- Rates of providing smoking cessation advice to patients in inpatient and outpatient settings varied considerably between studies; additionally, low rates for follow-up contacts relating to smoking cessation for their patients following support were seen in inpatient settings.

- Approximately half of staff from the US from inpatient and outpatient settings referred their patients to stop smoking services. However, stop smoking services in the UK never or rarely receive referrals from inpatients with mental illnesses. Additionally, the mental health status of clients attending stop smoking services in the UK is not known. An audit from the UK identified virtually no inpatients were referred to a NHS Stop Smoking Service.

- Staff perceived smoking cessation should be integrated into the inpatient based health care plan of the patient, and strong collaborations should be formed between key workers and doctors during the inpatient stay, and between inpatient and community teams. Additionally, smoking cessation and smoking reduction should be tailored to the needs of the inpatients with mental illness, with support being provided through local stop smoking services.

- Staff perceived smoking cessation support should be adopted first in practices in which there was a strong interest in smoking cessation.
- Implementing a tailored tobacco dependence service in the UK's largest mental health trust through the development of an integrated smoking care pathway, whilst offering flexible support for smoking cessation and reduction programmes through the use of dedicated staff to provide the service, resulted in a modest service uptake rate overall. However, in the inpatient setting, where smokers can be easily identified due to smoking status recording being mandatory, almost a quarter of all smokers engaged with the service.

This review further noted that no or very few studies were identified which assessed:

- The views, attitudes, and beliefs of household members and relatives of patients with mental illness regarding barriers of, and facilitators for, smoking cessation
- Views, attitudes, and beliefs, regarding barriers of, and facilitators for, using interventions for temporary abstinence
- Whether there were differences in views, attitudes and beliefs by age, gender, socioeconomic status, sexual orientation, disability, religion, and severity of dependence.

This review highlights the urgent need for further high quality research to be performed to assess the views, attitudes and beliefs of patients, staff members and relatives regarding whether the acceptability of interventions for temporary abstinence.

ABBREVIATIONS USED

CC Case-control study design

MM Mixed method study design

PE Programme Evaluation

Q Qualitative study design

S Survey or questionnaire design

INTRODUCTION AND BACKGROUND

SIGNIFICANCE OF SMOKING FOR MENTAL HEALTH

The significance of tobacco smoking in the context of severe mental illness is substantial. Patients diagnosed with severe mental illness are up to three times more likely to be smokers than the general population, with smoking prevalence reaching figures of up to 70% for certain sub groups, such as inpatients, and patients with schizophrenia [1]. Smokers with mental illness have also been found to display patterns of heavy smoking and severe nicotine dependence [2], as well as higher nicotine and cotinine levels that are attributable to increased nicotine intake per cigarette [3]. The disproportionately high rates of smoking have been identified as causes of the increased risk of tobacco-related morbidity and excess mortality in this population (with cancers, respiratory and cardiovascular disease prevalence being high) [4], thus constituting a major contributor to health inequalities in this population. The importance of addressing the issue is increasingly being recognised and has been acknowledged in a range of seminal documents, such as the recent governmental tobacco control plan *Healthy lives, healthy people* (2011), and the mental health strategy plan *No health without mental health* (2011).

The underlying reasons for the strong relationship between smoking and mental illness are complex and vary across diagnoses. Factors contributing to increased smoking have been found to be neurobiological, psychosocial, and genetic in nature [5, 6]. Nicotine interacts with several neurotransmitter systems in the brain and mediates the release of neurotransmitters such as dopamine, noradrenaline and serotonin, which affect mood, cognitive functioning, attention, and memory. Self-medication for and self-regulation of symptoms of mental illness has therefore been proposed as a potential explanation for frequent and heavy smoking among individuals with mental illness [4]. It has also been emphasised that smoking often constitutes a means of social interaction, reducing social inhibition and isolation frequently encountered in this population [5]. Smoking is also relevant from a clinical perspective, as hydrocarbon agents in tobacco smoke induce liver enzymes responsible for drug clearance, thus affecting drug levels of antipsychotic medication. Patients who smoke consequently require higher doses of medication, as their drug metabolism is accelerated by smoking. Hence, tobacco abstinence or quitting requires monitoring of blood levels of medications such as clozapine, as decelerated clearance can potentially lead to toxicity [6].

SMOKING IN MENTAL HEALTH SETTINGS: SYSTEMIC ISSUES

Despite the complexities that mark smoking as a matter of particular importance in the context of mental illness, tobacco dependence constitutes a largely neglected issue in mental health settings, with smoking being historically deeply embedded in the culture of treatment environments [7], and clinicians being reluctant to address the issue proactively as an integral part of treatment [8]. While a societal change towards reducing smoking and the exposure to tobacco smoke in public and work places has taken place in the UK over recent years, smoking is still largely condoned across psychiatric settings, and many mental health professionals perceive it as an important coping mechanism for patients [9]. Smoking has, furthermore, transpired to be a frequently used means of reward or punishment in achieving compliance with treatment, and to play an important part in the context of social interaction between patients and staff [10]. Of particular importance in this context

is the smokefree policy that has been implemented in mental health settings in July 2008. Whilst this is a potential avenue towards health protection and promotion in a vulnerable population, it has since been shown that there is cause for concern, as policies appear to be implemented incoherently, with smoking still being facilitated on a regular basis and viewed as the norm rather than the exception [11]. Furthermore, striking deficiencies in clinical staff knowledge with regard to smoking and its links with mental illness, including metabolic interactions with medication and use of pharmacotherapy for smoking cessation, have been identified, which arguably pose challenges to the appropriate support of patient smokers admitted to treatment environments in which their smoking behaviour is likely to change [12].

Treatment of smoking patients with severe mental illness

Contrary to common perception, patients with severe mental illness are frequently willing to quit smoking [13] provided they receive tailored support, though success in quitting appears to be only half of that in the general population [14], and relapse rates are higher [7]. Pharmacological treatment with both NRT and bupropion (the most recent pharmacological treatment, varenicline, is currently being trialed for safety in the psychiatric population), given separately or in combination, has proven effective and well-tolerated in psychiatric populations [15]. Additional cognitive behavioural support in groups, which has been shown to have potentially beneficial outcomes on quitting attempts in the normal population [16], has been integrated into tailored behavioural programmes for patients with severe mental illness successfully [17]. As many mental health patients are severely dependent on tobacco, and typically experience changing levels of motivation to stop smoking depending on their perceived ability to address their addiction in the light of mental resources, it has been proposed that in this population, smoking reduction may be a viable route towards harm reduction and eventual abstinence [18].

However, clear guidance with regard to treatment models, including the integration of tobacco dependence treatment in care pathways and consideration of smokefree policy implementation in treatment settings, is to date missing. In view of the importance of the issue from public health, clinical, economic, sociological, and policy perspectives, this is a shortcoming that should urgently be addressed.

Aim of the review

This systematic review aims to identify the factors that act as barriers or facilitators to implementing smoking cessation and temporary abstinence interventions, including strategies for referring people to stop smoking or hospital/unit based stop smoking services, from the perspectives of users and providers in mental health services.

RESEARCH QUESTIONS ADDRESSED

The review addressed the following key research questions:

- *What are the barriers and facilitators that affect the delivery of effective interventions, for example the interventions as identified in review 4?*
- *Which strategies/approaches are effective in encouraging mental health care professionals to record smoking status?*
- *Which strategies/approaches used by secondary care mental health services are effective for:*
    - *Providing people from the population of interest with smoking cessation information, advice and support?*
    - *Referring people from the population of interest to stop smoking or hospital based stop smoking services?*
- *How can community, primary, and secondary care mental health care providers collaborate more effectively to integrate smoking cessation support within care pathways?*

Subsidiary questions included:

- *What are the views (knowledge, attitudes, and beliefs) of the populations of interest in mental health services (all patients, service users [including family, carers, and visitors]) who may use smoking cessation or temporary abstinence interventions?*
- *What are the views (knowledge, attitudes, and beliefs) of the service providers within the NHS stop smoking services and mental health staff within hospitals, outpatient clinics and the community, including intensive services in psychiatric units and secure hospitals?*
- *Are there differences in acceptability of smoking cessation and temporary abstinence interventions by deliverer, setting, timing (or point in the care pathway), frequency, duration, and severity of dependence?*
- *Are there differences in acceptability of smoking cessation and temporary abstinence interventions by mental health diagnosis, gender, sexual orientation, age, ethnicity, religion, socioeconomic status, disability, and population of interest (including patients, household members, visitors and staff)?*

METHODS

INCLUSION AND EXCLUSION CRITERIA

TYPES OF STUDY DESIGNS

Both qualitative and quantitative evidence from primary studies and systematic review of studies were eligible for inclusion. We considered systematic reviews, trials (controlled and non-controlled), descriptive studies (including questionnaire surveys, and process evaluations), qualitative studies (including, but not restricted to, ethnographies, phenomenologies, and grounded theory studies), and discussion papers or reports. Discussion papers and reports were only used to develop the themes for the analysis, and thus were not used as evidence in the findings of this review unless we were unable to source any additional evidence that supported the theme.

TYPES OF PARTICIPANTS

We considered studies which included the following populations of interest of any age who smoke:

- All users of secondary care mental health services, including those who are in the process of being referred to or have recently been discharged from child, adolescent, adult or older people mental health services:
    - In-patient, residential and long-term care for severe mental illness in hospitals, psychiatric and specialist units and secure hospitals
    - Patients who are within the care of specialist community-based multidisciplinary mental health teams
- People who lived in the same household as a mental health service user, such as partners, parents, other family members and carers
- Visitors to secondary care mental health setting who were not receiving treatment or care, such as relatives or friends of patients and service users
- Staff (including support staff, volunteers, agency/locum staff and staff employed by contractors) who worked in secondary care mental health settings, in particular those who had direct contact with patients and service users

PHENOMENA OF INTEREST

We considered any barriers or facilitators (including knowledge, attitudes and beliefs) of using or implementing smoking cessation or temporary abstinence approaches. We included any pharmacological, psychological or self-help intervention that aimed to assist with smoking cessation or temporary abstinence. Pharmacological interventions could be administered alone or in combination with other interventions for smoking cessation or temporary abstinence. We also included any approaches used by, or with, mental health professionals/ mental health care providers/ the wider care team to increase recording, identification and/or referral to stop smoking services or mental healthcare-based stop-smoking services. This review considered all relevant contexts in which the phenomena were experienced.

EXCLUSION CRITERIA

We did not consider users of primary care services or users of secondary care services, other than mental health services, their parents, carers and other family members, staff working in, and visitors to, secondary care services other than mental health. We did not consider barriers or facilitators of smoking cessation interventions in primary care, medical and surgical care or obstetric care. We also did not consider policy or legislative interventions, or interventions aimed at preventing uptake of tobacco use.

SEARCH STRATEGY

Sensitive search strategies were developed by an information specialist in conjunction with the research team and peer-reviewed by information specialists at NICE using a combination of controlled vocabulary and free-text terms. The search strategy was initially developed in MEDLINE and was then adapted to meet the syntax and character restrictions of each included database.

The ICD-10 Classification of Mental health and Behavioural Disorders diagnostic criteria was used to refine the populations of interest to aid with searching for relevant disorders. The search strategy focused on the following ICD-10 diagnoses, for each of which we developed detailed search terms as demonstrated in the example of the search strategy:

F00-F09	Organic, including symptomatic, mental disorders
F10-F19	Mental and behavioural disorders due to psychoactive substance use
F20-F29	Schizophrenia, schizotypal and delusional disorders
F30-F39	Mood (affective) disorders
F40-F48	Neurotic, stress-related and somatoform disorders
F50	Eating disorders
F60-F62	Specific personality disorders, Mixed and other personality disorders, Enduring personality changes
F84	Pervasive developmental disorders
F90-F92	Hyperkinetic disorder, Conduct disorder, Mixed disorders of conduct and emotions

In our judgement, the search for specific terms related to the following diagnoses would not yield meaningful outcomes (owing to the fact that the respective populations are highly unlikely to constitute target groups of tobacco related research), therefore we did not to develop detailed search terms for those, but to imply inclusion of these groups through the identification of studies that include populations of 'smokers treated in mental health settings' more generically.

F51-F59 The excluded syndromes refer to nonorganic sleep disorders, sexual dysfunction (not caused by organic disorder or disease), mental and behavioural disorders associated with the puerperium, and abuse of non-dependence-producing substances

F63-F69 The excluded disorders refer to habit and impulse disorders, gender identity disorders, disorders of sexual preference, and psychological and behavioural disorders associated with sexual development and orientation

F70-F79 The excluded diagnoses refer to mental retardation

F80-F89 The excluded disorders refer to specific developmental disorders of speech and language, scholastic skills, motor function (excluding F84)

F93-F99 The excluded disorders refer to emotional disorders, social functioning, nonorganic enuresis and nonorganic encopresis with onsets specific to childhood, and tic disorders

Literature searches were conducted from 1985 onwards. The full search strategies for each database source can be found in Appendix 1. The following databases were searched:

- AMED (Allied and Complementary Medicine)
- ASSIA (Applied Social Science Index and Abstracts)
- British Nursing Index
- CDC Smoking & Health Resource Library database
- CINAHL (Cumulative Index of Nursing and Allied Health Literature)
- Cochrane Central Register of Controlled Trials
- Cochrane Database of Systematic Reviews (CDSR)
- Cochrane Tobacco Addiction group Specialist Register
- Conference Papers Index (years: 2008-2012)
- Database of Abstracts of Reviews of Effectiveness (DARE; 'other reviews' in CDSR database)
- Database of Promoting Health Effectiveness Reviews (EPPI Centre DoPHER)
- EMBASE
- Health Evidence Canada
- Health Technology Assessment (HTA) database in the CDSR database
- HMIC
- International Bibliography of Social Sciences
- Medline, including Medline in Process
- PsycINFO
- Social Policy and Practice
- Social Science Citation Index and Conference Proceedings Citation Index
- Sociological Abstracts
- Trials Register of Promoting Health Interventions (EPPI Centre TRoPHI)
- UK Clinical Research Network Portfolio Database

The following websites were also searched for research papers relevant to the review questions:

- Smoke free http://smokefree.nhs.uk

- NHS Centre for Smoking Cessation and Training http://www.ncsct.co.uk/
- Action on Smoking and Health (ASH) http://www.ash.org.uk
- Treat tobacco.net http://www.treatobacco.net/en/index.php
- Society for Research on Nicotine and Tobacco http://www.srnt.org
- International Union against Cancer http://www.uicc.org
- WHO Tobacco Free Initiative (TIF) http://www.who.int/tobacco/en
- International Tobacco Control Policy Evaluation Project http://www.itcproject.org
- Tobacco Harm Reduction http://www.tobaccoharmreduction.org/index.htm
- Current controlled trials www.controlled-trials.com
- Association for the treatment of tobacco use and dependence (ATTUD) www.attud.org
- National Institute on drug abuse- the science of drug abuse and addiction http://www.nida.nih.gov/nidahome.html
- NICE http://www.nice.org.uk/
- Public health observatories http://www.apho.org.uk/resource/advanced.aspx
- Scottish Government http://www.scotland.gov.uk/topics/research
- Welsh Assembly Government http://wales.gov.uk/
- NHS Evidence https://www.evidence.nhs.uk/
- Joseph Rowntree Foundation http://www.jrf.org.uk/publications
- UK Centre for Tobacco Control Studies http://www.ukctcs.org/ukctcs/index.aspx

We electronically searched the World Conference on Tobacco or Health proceedings in years 2006, 2009 and 2012 (the conference is held every three years) to identify further potentially eligible papers, as this conference is not included in the databases and websites above. We also checked reference lists of included previous reviews to identify further potentially eligible studies. Additionally, we screened the electronic files of papers identified from Reviews 1, 2, 3, 6, and 7 for studies that had potential relevance.

Studies were managed during the review using the EPPI-Centre's online review software EPPI-Reviewer (version 4.0).

TITLE AND ABSTRACT SCREENING

All records from the searches were uploaded into a database and duplicate records were removed. Where no abstract was available, a web search was first undertaken to locate one; if no abstract could be found, records were screened on title alone and full-text documents were retrieved where there was any doubt.

To trial the inclusion criteria, a pilot round of screening was conducted on a random selection of 30 document titles and abstracts. Piloting was conducted by three reviewers. A reconciliation meeting was then held to discuss disagreements and suggest changes to the inclusion criteria.

Following the pilot screening, 1,143 records (10%) were double screened. The inter-rater agreement rate for double-screening was 97.7%, which was considered by the project team and NICE to be sufficiently high. As such, the remaining documents were split between two reviewers who independently screened their allocated records. Of the double-screened items, any disagreements were resolved by a third reviewer. Throughout the entire process, the reviewers discussed difficult and ambiguous records to ensure consistency.

The final inclusion criteria are presented below (also see Appendix 2 for detailed guidance and definitions used for each criterion). The criteria were applied in a hierarchical fashion.

- The document must be published during or after 1985
- The document must report on a piece of empirical research
- The title and/or abstract must refer to smoking cessation interventions/ services
- The study (or a component of it) must be conducted in a mental health secondary care setting, or include patients or workers in mental health services, or family/friends/visitors of mental health patients.
- The study design must involve a comparison (e.g., controlled trials, before-and-after) and/or views or process evaluation (e.g., interviews, surveys)

If the study met the above criteria and included evidence on barriers or facilitators (including knowledge, attitudes and beliefs) of using or implementing smoking cessation interventions/ services, it was marked as relevant to Review 5. If the study met the above criteria and evaluated the effectiveness of an intervention, it was marked as relevant to Review 4.

Full text screening

Once all of the titles and abstracts were screened, the full-text documents were retrieved for those records marked for inclusion. The retrieved documents were then re-screened on the basis of the detail available in the full-text article by Ms Jayes using a previously piloted screening checklist (Appendix 3). A random selection of a 40% of the full-text documents was double-screened by the Ms Jayes and Dr Leonardi-Bee and Dr Ratschen. Forty-nine articles were double screened based on full text, and we reviewers agreed on 96%, which was deemed sufficiently high. Any disagreements were discussed. Those documents that passed the inclusion criteria on the basis of the full-text screening were included in the review.

Data extraction and quality assessment

Data extraction and appraisal of the quality of the included studies was performed by Ms Jayes, Dr Ratschen and Dr Leonardi-Bee, with a random selection of 10% being double-assessed by Professor McNeill. Data were extracted using previously piloted data extraction forms for which followed the methods as outlined in the methods manual www.nice.org.uk/phmethods2009, and PROGRESS-Plus criteria (age, sex, sexual orientation, disability, ethnicity, religion, place of residence, occupation, education, socioeconomic position and social capital) was noted. Any difference in assignment of quality was resolved through discussion. Internal and external validity of the studies was rated using the previously piloted quality appraisal checklists which followed the methods as outlines in the methods manual, with each study being coded as either ++, +, or -. ++ indicated a high quality score for internal and external validity, where the study demonstrated all or most of the checklist criteria had been fulfilled, and where these had not been fulfilled, the conclusions of the study were unlikely to alter, had this been the case. + indicated moderate quality for internal and external validity, where the study demonstrated some of the checklist criteria had been fulfilled, and where they had not been fulfilled, or not adequately described, the conclusions of the study were unlikely to alter. – indicated a low quality score for internal and external validity, where the study demonstrated few or none of the checklist criteria had been fulfilled and the conclusions of the study were likely or very likely to alter, had this been the case. Additional criteria were used to determine the quality of the survey based questionnaire studies, with studies being given higher quality scores if they demonstrated a lack of bias during the selection of sample, a sample size of 100+ participants, response rate of at least 65%, and medium or high overall relevance to the research questions of the review. Composite inter-rater agreement (the per cent agreement) was calculated and reported.

Data synthesis

Preliminary themes and subthemes based on the user and provider perspectives were identified from the included studies, and discussed with members of the team, to determine whether these reflected the spectrum of evidence comprehensively. We also used discussion pieces to develop the themes. Themes of particular relevance to the UK were highlighted. Where possible, data were meta-synthesised to identify findings, group findings into categories on the basis of similarity in meaning, and aggregated to generate synthesised findings. Where we were unable to perform meta-synthesis, we summarised the findings of the individual studies using a narrative approach through listing significant factors and themes. Data were characterised using PROGRESS-Plus, and sensitivity analyses were carried out where enough papers had data relating to specific inequality measures known to be associated with higher prevalence of smoking and those in who smoking cessation and temporary abstinence are known to have differential impacts.

Evidence tables

Evidence tables were completed for each included study.

EVIDENCE STATEMENTS

Evidence statements based on an aggregated summary of the available evidence were produced, which reflected the strength (quality, quantity and consistency) of the evidence, and statements regarding its applicability were made. The quality of the evidence was categorised as strong (where statements were based on evidence from several high quality studies), moderate (where statements were based on evidence from either one high study, or a mixture of high and lower quality studies), weak (where statements were based on evidence from lower quality studies), or very weak (where statements were based on evidence from individual lower quality studies). Statements were also made where there was a lack of evidence. Statements regarding the applicability of the evidence to the UK setting were also reported and categorised as directly applicable, partially applicable, or not applicable.

RESULTS

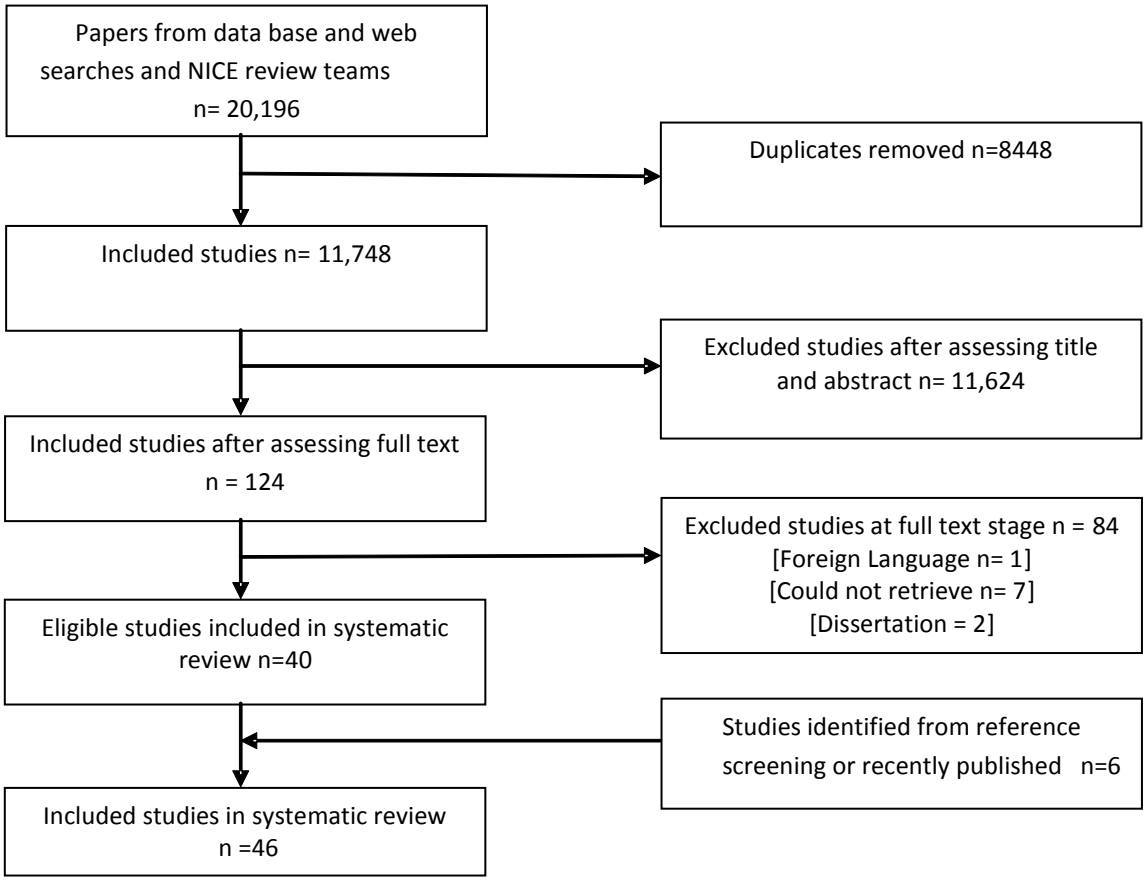
OVERVIEW OF RESULTS FROM SEARCH

20,196 references were identified from the search strategy, comprising 20,058 references from the databases searched, 35 references located through web searches, and 103 references located through other NICE review teams. Following removal of 8,448 references due to duplication, a total of 11,748 references were screened based on their title and abstract. Of these, 11,624 references were deemed not eligible for inclusion, thus a total of 124 were screened based on their full text. We excluded 84 of the full-text papers with the majority of these being excluded due to not fulfilling the inclusion criteria; however one of these was excluded due to a translation not being available, two due to the dissertation not being available and seven due to the full text paper being irretrievable. Additionally, we identified a further five eligible papers from reference scanning of identified reviews. A moderately high inter-rater agreement rate of 67% was found between the reviewers based on data extraction and quality assessment.

One additional paper was recently published which assessed implementing a tailored tobacco dependence service in UK mental health settings, and assessing its impact, and barriers and facilitators to implementation (Parker et al 2012). As a pragmatic pilot project, its focus differs from the other included studies, and the findings are mainly presented and discussed in a separate section of the results. Thus, a total of 46 papers were deemed eligible for inclusion into the review (Figure 1).

A further two unpublished studies were recently identified through personal communication with lead authors in the area (Howard LM, Bekele D, Rowe M, Demilew J, Bewely S, & Marteau TM. Smoking cessation in pregnant women with mental disorders: a cohort and nested qualitative study, unpublished; Howard LM. Mental health nursing and physical health care: a cross-sectional study of nurses' attitudes, practice and perceived training needs for the physical health care of people with severe mental illness, unpublished). The findings from these studies will be incorporated into the review once the papers have been published. No further eligible studies were identified following the NICE call for evidence.

Figure 1 **Flow chart of study selection**



Overview of studies included in the review

A total of 46 primary studies were included in the review (Appendix 4), with the majority focusing on the views of staff and mental health workers. One critical review and two discussion pieces were also included in the review.

Settings of the studies

Eighteen of the included studies focused solely on inpatient settings, 16 solely on community settings, and nine on both inpatients and outpatient settings. The setting was unclear in the remaining three studies.

The majority of the included studies were conducted in the US, with a further nine studies being conducted in Australia, 10 studies in England, four studies in Canada, and individual studies from Brazil and South Ireland.

The majority of the included studies focused on the views, attitudes and beliefs of staff members, with a further 12 focusing solely on the views of the patients, and five focusing on both the views of the staff and the patients. One of the included studies reported the views of relatives and main care givers. One of the included studies collected information on barriers and facilitators relating to the implementation of a tobacco dependence service via the advisers.

DESIGNS OF THE STUDIES

The majority of the included studies used a survey based questionnaire, with only 12 studies using solely a qualitative approach, six using a mixed methods approach, and individual studies using either a case control design or an evaluation of a smoking cessation programme.

QUALITY ASSESSMENT

The overall quality of the included studies varied, with 12 studies being awarded the highest score for quality, respectively; which indicated that the study demonstrated all or most of the checklist criteria had been fulfilled, and where these had not been fulfilled, the conclusions of the study were unlikely to alter, had this been the case. Twenty-four studies were awarded medium score for quality, respectively; which indicated that the study demonstrated some of the checklist criteria had been fulfilled, and where they had not been fulfilled, or not adequately described, the conclusion of the study were unlikely to alter. Finally, ten studies were awarded the lowest score for quality, respectively; which indicated that few or none of the checklist criteria had been fulfilled and the conclusions of the study were likely or very likely to alter, had this been the case.

APPLICABILITY

Ten of the included studies were conducted in the UK **[Dickens 2004, Dickens 2005, Edmonds 2007, McNally 2010, Parker 2012, Ratschen 2009a, Ratschen 2009b, Ratschen 2010b, Sidani 2011, Stubbs 2004]**. The quality of these studies was generally average with seven being awarded the medium score for quality **[Dickens 2004, Dickens 2005, McNally 2010, Parker 2012, Ratschen 2009b, Sidani 2011, Stubbs 2004]**; whilst the remaining three were awarded the highest score **[Edmonds 2007, Ratschen 2009a, Ratschen 2010b]**.

A further 10 studies were conducted in countries which have similar smoking cessation services to that of the UK **[Ashton 2010, Lawn 2002, Lawn 2004, Lawn 2006, Lubman 2006, Mikhailovich 2008, O'Donovan 2009, Tsourtos 2011, Wye 2009, Wye 2010]**. The quality of these 10 studies was generally high with six being awarded the highest score for quality **[Lawn 2002, Lawn 2004, Lawn 2006, Tsourtos 2011, Wye 2009, Wye 2010]**, whilst the remaining four were either awarded a medium score **[Ashton 2010, Lubman 2006, O'Donovan 2009]** or the lowest score **[Mikhailovich 2008]**.

Question 1. What are the barriers and facilitators that affect the delivery of effective interventions, for example the interventions as identified in review 4?

All, except two **[Himelhoch 2003, Johnson 2009]**, of the 46 studies included in the review addressed this question directly or indirectly. The studies are summarised in detailed in the evidence tables in Appendix 5. The results relating to this question are presented below and categorised based on the populations of interest; patients; relatives; service providers (staff and management). The country, study design (CC=case control, MM=mixed methods, PE=programme evaluation, Q=qualitative, S=survey), and quality score (++, +, -) for each study is presented in parentheses following the first author's name and year of publication.

Question 1a. What are the views (knowledge, attitudes, and beliefs) of the populations of interest in mental health services (all patients, service users [including family, carers, and visitors]) who may use smoking cessation or temporary abstinence interventions?

Seventeen studies and one review reported the views of patients and service users regarding the barriers and facilitators that affect the delivery of effective smoking cessation and temporary abstinence interventions in the population of interest **[Dickens 2005; Dickerson 2011; Edmonds 2007; Goldberg 1996; Green 2005; Kelly 2010; Lawn 2002; Lawn 2004; Lucksted 2000; Mikhailovich 2008; Morris 2009; Ratschen 2010b, Scherer unpublished; Solty 2009; Snyder 2008; Tidey 2009; Tsourtos 2011; Williams 2011]**. The methods and findings of the studies are presented briefly in Table 1.

Table 1 Characteristics of included studies – Patient and service users' views (knowledge, attitudes and beliefs)

Author, year, quality	Aim of the study	Method, population, and setting	Location
Author: Dickens **Year**: 2005 **Quality**: +	Views and beliefs of psychiatric inpatients about smoking in hospital	**Method**: Survey **Population**: Patients on forensic wards of psychiatric hospital **Sample size**: 45 **Setting**: Inpatient	England
Author: Dickerson **Year**: 2011 **Quality**: +	To understand better the experiences of persons with serious mental illness who have quit smoking	**Method**: Interviews **Population**: Patients with serious mental illness (schizophrenia, schizoaffective disorder, bipolar disorder, major depression) **Sample size**: 78 **Setting**: Community	USA
Author: Edmonds **Year**: 2007 **Quality**: ++	To examine the process of mental health professionals offering stop smoking support, exploring the experiences and perceptions of the participants in the one to one stop smoking intervention	**Method**: Evaluation and patient interviews **Population**: Mental health service users accessing specialised stop smoking service **Sample size**: 20 **Setting**: Community	England
Author: Goldberg **Year**: 1996 **Quality**: ++	To assess what clients themselves see as barriers and opportunities for smoking cessation	**Method**: Survey and focus groups **Population**: Patients with schizophrenia **Sample size**: 105 **Setting**: Community	Canada
Author: Green **Year**: 2005 **Quality**: +	To examine the attitudes of people with mental illness towards smoking reduction and cessation	**Method**: Focus groups **Population**: Patients with self-reported mental illness **Sample size**: 21 **Setting**: Community	Canada
Author: Kelly **Year**: 2010 **Quality**: -	To examine the views and attitudes regarding health risks of cigarettes smoking and motivators for cessation in smokers with schizophrenia and smoker without a psychotic disorder	**Method**: Case-control study **Population**: Patients with schizophrenia **Sample size**: 200 **Setting**: Unclear	USA
Author: Lawn **Year**: 2002 **Quality**: ++	To describe the experiences of mental health clinics as they relate to smoking behaviour, the relationship of smoking behaviour to the course of their mental illness and its management, and to their attempts to quit smoking	**Method**: Interviews **Population**: Patients with schizophrenia, depression, bipolar affective disorder, and personality disorder **Sample size**: 24 **Setting**: Community	Australia
Author: Lawn **Year**: 2004 **Quality**: ++	To compare experiences from two psychiatric institutions regarding smoking related problems	**Method**: Ethnographic **Population**: Ward patients **Sample size**: 500 observed	Australia

		Setting: Inpatient	
Author: Lucksted **Year**: 2000 **Quality**: ++	To understand smoking and quitting from the perspective of the population of persons attending mental health programs	**Method**: Focus groups **Population**: Clients of program with mental illness **Sample size**: 40 **Setting**: Community	USA
Author: Mikhailovich **Year**: 2008 **Quality**: -	An evaluation of a smoking cessation programme for special populations through examining the value of NRT within the programme, identify changes to behaviour, wellbeing, and other factors associated with the health of the participants, and to document programme factors and strategies that contributed towards the success of the programme	**Method**: Programme evaluation (methods not clear) **Population**: Patients participating in drug and alcohol service, Aboriginal health service, and mental health service **Sample size**: 11 **Setting**: Inpatient and community	Australia
Author: Morris **Year**: 2009 **Quality**: +	To understand the factors that impede and support tobacco cessation efforts from the perspective of both community mental health patients and providers	**Method**: Focus groups **Population**: Mental health service users **Sample size**: 62 **Setting**: Community	USA
Author: Ratschen **Year:** 2010b **Quality:** ++	To explore patients' experiences, smoking behaviour and symptoms of nicotine withdrawal in the context of a comprehensive smoke-free policy on mental health acute wards, and to identify options for the future to promote and support smoking cessation and/or reduction in these settings	**Method:** Semi-structured interviews **Population:** Patients admitted to acute care inpatient psychiatry unit **Sample size:** 15 **Setting:** Inpatient	England
Author: Scherer **Year**: Unpublished **Quality**: +	To assess the opinions of hospitalised patients, their relatives, and care team members about tobacco use in the hospitalised environment and smokers' dependence levels	**Method**: Survey and interviews **Population**: Hospitalised inpatients and relatives or responsible care givers **Sample size**: 25 patients and 25 relatives/care givers **Setting**: Inpatient	Brazil
Author: Solty **Year**: 2009 **Quality**: +	To determine the prevalence of cigarette smoking and the degree of nicotine dependence, and to assess smokers attitudes towards smoking, motivation to quitting, and the frequency that advice to quit was provided	**Method**: Survey **Population**: Patients admitted to acute care inpatient psychiatry unit **Sample size**: 211 **Setting**: Inpatient	Canada
Author: Snyder **Year**: 2008 **Quality**: ++	To identify personal, social and environmental factors that affect smoking cessation in persons with serious mental illness	**Method**: Focus groups **Population**: Patients residing in psychiatric rehabilitation centres **Sample size**: 25 **Setting**: Inpatient	USA
Author: Tidey **Year**: 2009 **Quality**: -	To compare the positive and negative smoking expectancies and intention to quit smoking in smokers with mental illness	**Method**: Survey **Population**: Patients with schizophrenia, schizoaffective disorder, and those without psychiatric illness **Sample size**: 81 **Setting**: Unclear	USA

Author: Tsourtos **Year**: 2011 **Quality**: ++	To determine why non-smokers are 'resilient' to smoking in a population where there is a high prevalence of smoking and high perceived levels of stress, in comparison with current smokers	**Method**: Interviews **Population**: Patients with medical diagnosis of depression, some of whom had other mental illnesses **Sample size**: 34 **Setting**: Community	Australia
Author: Williams **Year**: 2011 **Quality**: -	To describe the reasoning behind the development of the comprehensive model for Mental Health Tobacco Recovery programme	**Method**: Critical review **Population**: N/A **Sample size**: N/A **Setting**: Unclear	USA

The findings of the studies are presented below based on themes and sub-themes relating to barriers and facilitators, with quotes to support the themes where possible.

The themes relating to the perceived barriers and facilitators are presented below in Table 2.

Table 2 Synthesis framework for views of patients and service users

Theme	Subthemes	Number of studies discussing theme
Patients' views, attitudes and perceptions regarding smoking	Reasons for/triggers of smoking: Psychosocial, environmental, and neurobiological factors Priority of smoking Cigarettes as a currency and mechanism of control	12
Patients' views, attitudes and perceptions regarding making a quit attempt	Perceived barriers of making a quit attempt Perceived facilitators to making a quit attempt	15
Patients' views, attitudes and perceptions regarding successfully quitting	Perceived barriers of successfully quitting Perceived facilitators of successfully quitting Outcomes following successfully quitting Suggested interventions for smoking cessation	12

1. Patients' views, attitudes and perceptions regarding smoking

Twelve studies discussed the patients' views, attitudes and perceptions of smoking. The theme is sub-divided into a) reasons for/triggers of smoking, b) priority of smoking, and c) cigarettes as a currency and mechanism of control.

Reasons for/triggers of smoking: Psychological, environmental, and neurological factors

In two studies, inpatients and outpatients expressed they used smoking as a vehicle for gaining more autonomy and exerting control over their lives **[Lawn 2002, Australia, Q++; Snyder 2008, USA, Q++]**.

> "*A lot of the things I get told [to do] but I can choose to smoke and drink. So when there's not many choices, to have something you can choose to do is pretty good you see.*" **[Lawn 2002, Australia, Q++]**

> "*I did quit for a few days, and that makes me a person [who] chooses; nobody is forcing me.*" **[Snyder 2008, USA, Q++]**

In seven studies of inpatients and outpatients, patients with mental illness often reported that boredom was a factor for their smoking **[Dickens 2005, England, S+; Goldberg 1996, Canada, MM++; Green 2005, Canada, Q+; Morris 2009, USA, Q+; Ratschen 2010b, England, Q++; Snyder 2008, USA, Q++; Tsourtos 2011, Australia, Q++]**, with some perceiving smoking as being '*something to do*' **[Goldberg 1996, Canada, MM++]**.

> "*Give me something to occupy my time. There is nothing to do….except smoke, sleep, and shower.*" **[Morris 2009, USA, Q+]**

> "*When I'm sitting around doing nothing, I smoke more; it fills the time.*" **[Snyder 2008, USA, Q++]**

> *"I started smoking 90 a day because of boredom."* **[Tsourtos 2011, Australia, Q++]**

> "*It [smoking] relieves boredom.*" **[Green 2005, Canada, Q+]**

Additionally, inpatients and outpatients from two studies identified the need for the availability of alternative activities in the community setting so that they had something meaningful to replace smoking **[Goldberg 1996, Canada, MM++; Ratschen 2010b, England, Q++]**.

> "*I know all the negative things that smoking does. If I had something to look forward to during the day, activities would keep my mind of the cigarettes.*" **[Goldberg 1996, Canada, MM++]**

> "*If you give up smoking, you have to give yourself something to do instead of that.*" **[Goldberg 1996, Canada, MM++]**

> "*If I do exercise, I don't want to smoke at all. If I could go to the gym here, I could stop immediately*" **[Ratschen 2010b, England, Q++]**

In four studies, inpatients and outpatients reported that they enjoyed smoking **[Edmonds 2007, England, Q++; Goldberg 1996, Canada, MM++; Lucksted 2000, USA, Q++; Ratschen 2010b, England, Q++]**, and in three studies inpatients and outpatients expressed it would be hard to replace the pleasure and satisfaction that cigarettes gave them **[Edmonds, 2007, England, ++; Synder 2008, USA, Q++; Lawn 2002, Australia, Q++]**. In one study, outpatients reported that family members thought smoking was one of the few pleasures they had **[Lawn 2002, Australia, Q++]**. In one study, outpatients reported that mental health staff encouraged them to continue smoking due to the lack of alternative pleasures in their life **[Lucksted 2000, USA, Q++]**.

> "*It is the only thing I do that I really enjoy,*" and "*[it's a] cheap thrill – [the] longer you go without, the more you enjoy it when you have it.*" **[Goldberg 1996, Canada, MM++]**

> *"Yeah, because it was my thing that I did was smoked…It was like a bereavement, it was… big hole, big, big hole."* **[Edmonds 2007, England, Q++]**

> "*[Not smoking would mean having] nothing to look forward to."* **[Snyder 2008, USA, Q++]**

> "*I've been trying to find the word for my smoking. It's sort of condolence. Like, I don't have much in my life, and smoking's been with me for a long time…When you don't have much in your life, it's a bit hard giving up something so familiar… And I think 'Well, why do I have to quit? I deserve something'."* **[Lawn 2002, Australia, Q++]**

> *"[Patient reported the staff member told them] You have so few pleasures in your life, hold on to those you do have, including smoking."* **[Lucksted 2000, USA, Q++]**

In six studies, inpatients and outpatients with mental illness reported smoking was a way to relax or calm down **[Green 2005, Canada, Q+; Morris 2009, USA, Q+; Ratschen 2010b, England, Q++; Snyder 2008, USA, Q++; Solty 2009, Canada, S+; Tsourtos 2011, Australia, Q++]**, and were effective at providing temporary relief from feelings of tension and anxiety.

> "*Stress makes me smoke more."* **[Green 2005, Canada, Q+]**

> "*Smoking has been a fall back for me because it has helped me in different situations; I just needed something that was going to get me through a hard time."* **[Tsourtos 2011, Australia, Q++]**

> "*I see that it works as a mild sedative. It keeps me calm when I'm under stress. When I'm under stress, I use cigarettes to help me relax."* **[Ratschen 2010b, England, Q++]**

In three studies, addiction and the habitual nature of smoking were frequently cited reasons for smoking in inpatients and outpatients with mental illness **[Solty 2009, Canada, +; Snyder 2008, USA, Q++; Goldberg 1996, Canada, MM++]**.

> "*I wouldn't know how not to smoke. I can't remember what it was like without smoking.*" **[Snyder 2008, USA, Q++]**

However, it is worth noting that many of the quotes above could also simply reflect a very heavy addiction to smoking, but the patients' perceive their smoking to be due to other factors, for example, relieving stress and anxiety, where the smoker feel less stressed when they smoke in comparison to them feeling more stressed when they withdraw from nicotine.

In two studies, outpatients described that cigarettes gave them a sense of companionship **[Lawn 2002, Australia, Q++; Snyder 2008, USA, Q++]**, and inpatients described that they helped to overcome feelings of loneliness **[Snyder 2008, USA, Q++]**.

> "*Who else have I got? They're always there. They're good friends and they don't criticise you.*" **[Lawn 2002, Australia, Q++]**
>
> "*…Smoking's been with me a long time. It's reliable. It doesn't let me know. It doesn't answer back… It's shared much of my day with me. It's there when I've gone thought most things, I suppose.*" **[Lawn 2002, Australia, Q++]**
>
> "*Smoking is a crutch for people being lonely. Begging for cigarettes gets you connected. You get introduced, and it draws attention to you. It helps you get to know people. It's some kind of security.*" **[Snyder 2008, USA, Q++]**
>
> "*[Cigarettes are a] good friend.*" **[Snyder 2008, USA, Q++]**

Additionally, in four studies, inpatients and outpatients expressed the opinion that smoking was a social pastime **[Green 2005, Canada, Q+; Goldberg 1996, Canada, MM++; Lawn 2004, Australia, Q++; Snyder 2008, USA, Q++]**, particularly in boarding home settings where smoking was a major component of their interaction with other residents **[Goldberg 1996, Canada, MM++]**.

> "*If you smoke, you can join the gang.*" **[Green 2005, Canada, Q+]**
>
> "*It was just good being around other people but they all used to smoke, so I just joined in. It was a real social thing. Some of the nurses used to come out and have a smoke and talk to you. They'd be talking to you just as a friend, not like when you were talking to the doctor.*" **[Lawn 2004, Australia, Q++]**

Furthermore, in one study, outpatients reported smoking was a means of connecting with friends and family, and mental health staff **[Morris 2009, USA, Q+]**. Additionally, peer pressure was cited as

a reason to smoke, with inpatients reporting pressure to continue to smoke from friends who were smokers **[Snyder 2008, USA, Q++]**.

In five studies predominately focusing on outpatient populations, patients made the link between using smoking as a coping strategy for helping them to cope with the symptoms of their mental illness **[Dickens 2005, England, S+; Goldberg 1996, Canada, MM++; Lawn 2002, Australia, Q++; Lucksted 2000, USA, Q++; Morris 2009, USA, Q+]**, including lessening the side effects of their psychotropic medication **[Lucksted 2000, USA, Q++]** and enhancing attention **[Morris 2009, USA, Q+]**.

> "*The voices I hear make me nervous, so I smoke to relax,*" and "*Smoking and worry things are connected …. I use smoking to relax from the worry things, can't get rid of the worry things, can't stop smoking."* **[Goldberg 1996, Canada, MM++]**

> "*It's [smoking] therapeutic for us. The nurse calms you down having a one to one in the smoke room." and "It helps break down barriers."* **[Dickens 2005, England, S+]**

> "*If you're going through a rough time, [mental] illness-wise… and you're getting an enormous amount of activity in your brain, and you just want to take a break, take five, you have a cigarette, and …. It helps focus you, calms your thinking.*" **[Lucksted 2000, USA, Q++]**

Additionally, in one study, outpatients reported that relatives tended to condone smoking as a mechanism that the patient used to manage their mental illness, and for some patients they thought relatives saw them as '*a lost cause and therefore beyond help with their smoking*' **[Lawn 2002, Australia, Q++]**.

In a further two studies, inpatients and outpatients reported they smoked because they feared illness deterioration **[Lawn 2002, Australia, Q++; Lawn 2004, Australia, Q++]**.

> "*When I'm well, I can do without a smoke for ages. I can stop smoking just like that! When I'm unwell, I'll smoke my head off."* **[Lawn 2002, Australia, Q++]**

> "*You have to keep it a level up… like it's something your brain and body's doing automatically to let you know that your nicotine level is dropping… it's a physical thing of actually needing it."* **[Lawn 2002, Australia, Q++]**

In one study, outpatients expressed that they were given more information from staff regarding the positive aspects of smoking, rather than the negative ones **[Morris 2009, USA, Q+]**.

> "*I more or less became a smoker because I was told it would help me with my illness. I was taught more about it helping with my illness than I was about cancer and stuff like that."* **[Morris 2009, USA, Q+]**

PRIORITY OF SMOKING

In three studies, inpatients and outpatients expressed smoking was a major priority in their lives **[Lawn 2002, Australia, Q++; Snyder 2008, USA, Q++; Tsourtos 2011, Australia, Q++]**, with cigarettes being referred to as an '*affordable luxury'* **[Snyder 2008, USA, Q++]**.

> "*It's like a security blanket."* **[Tsourtos 2011, Australia, Q++]**

> "*The first time when I had no money… I used to go around the street looking for butts… I don't know where or who they came from but I'd unroll them and join them all up again in one…. I've been that bad…. I would have done anything for one at the time.*" **[Lawn 2002, Australia, Q++]**

> "*Once I was in hospital and I didn't smoke for 8 days. I felt good. A couple [of] hours after leaving, my case worker offered me some money, and then I snapped in my head, 'I'm gonna buy some cigarettes'. I didn't have anything else to fall back on. There wasn't anything else affordable."* **[Snyder 2008, USA, Q++]**

CIGARETTES AS A CURRENCY AND MECHANISM OF CONTROL

In three studies, patients reported cigarettes were used as a form of currency in an inpatient setting or as a mechanism of control **[Lawn 2002, Australia, Q++; Lawn 2004, Australia, Q++; Lucksted 2000, USA, Q++]**.

In one study, inpatients reported the physical structure of the inpatient setting was found to promote a power play between patients and staff **[Lawn 2004, Australia, Q++]**.

> "*When you're locked up and treated like animals in a cage, you choose to smoke because there's not much else you can choose. If you fight back, they throw you in seclusion. When other things are so restricted on you, smoking is one thing you can decide to do to nark them, to show them that they're not totally controlling you… You feel very powerless."* **[Lawn 2004, Australia, Q++]**

Additionally, in two further studies, outpatients perceived their smoking was used as a reward or punishment in order to control their behaviour during their time in an inpatient setting **[Lawn 2002, Australia, Q++; Lucksted 2000, USA, Q++]**.

> "*Sometimes the smokes were almost used like blackmail so that, if you didn't do the right thing, the cigarettes were denied you. So if you're someone who usually smokes a cigarette every twenty minutes or so, you'd be frantic. It takes away your sense of being a person.*" **[Lawn 2002, Australia, Q++]**

In one study, inpatients reported that smokers would be subject to reduced rates for boarding so they were able to have sufficient funds to buy cigarettes, or that they exchanged cigarettes for other needs, including sexual interactions with other inpatients **[Lawn 2004, Australia, Q++]**.

> "*Occasionally we have entrepreneurial people who charge considerably more than the cost of cigarettes, or they'll actually use cigarettes in order to get sexual favours."* **[Lawn 2004, Australia, Q++]**

EVIDENCE STATEMENTS

ES 1.1 There is strong evidence to suggest inpatients and outpatients' perceived the reasons for smoking are: to gain autonomy **[Lawn 2002, Australia, Q++; Snyder 2008, USA, Q++]**; relieve boredom **[Dickens 2005, England, S+; Goldberg 1996, Canada, MM++; Green 2005, Canada, Q+; Morris 2009, USA, Q+; Ratschen 2010b, England, Q++; Snyder 2008, USA, Q++; Tsourtos 2011, Australia, Q++]**; nicotine addiction **[Solty 2009, Canada, S+; Snyder 2008, USA, Q++; Goldberg 1996, Canada, MM++]**; pleasure and enjoyment **[Edmonds 2007, England, Q++; Goldberg 1996, Canada, MM++; Lawn 2002, Australia, Q++; Lucksted 2000, USA, Q++; Ratschen 2010b, England, Q++; Snyder 2008, USA, Q++]**; and to relax and calm down **[Green 2005, Canada, Q+; Morris 2009, USA, Q+; Ratschen 2010b, England, Q++; Snyder 2008, USA, Q++; Solty 2009, Canada, S+; Tsourtos 2011, Australia, Q++]**.

ES 1.2 There is strong evidence from Canada and England to suggest inpatients and outpatients perceive the need for alternative meaningful activities to replace smoking **[Goldberg 1996, Canada, MM++; Ratschen 2010b, England, Q++]**.

ES 1.3 There is strong evidence to suggest inpatients and outpatients smoke to give them a sense of companionship **[Lawn 2002, Australia, Q++; Snyder 2008, USA, Q++]** and as a form of social pastime **[Green 2005, Canada, Q+; Goldberg 1996, Canada, MM++; Lawn 2004, Australia, Q++; Morris 2009, USA, Q+; Snyder 2008, USA, Q++]**, particularly in residential care and inpatient settings where smoking was a major component of their interaction with other residents.

ES 1.4 There is strong evidence to suggest inpatients and outpatients report smoking as a form of self-medication to cope with symptoms of their mental illness **[Goldberg 1996, Canada, MM++; Lawn 2002, Australia, Q++; Dickens 2005, England, S++; Morris 2009, USA, Q+; Lucksted 2000, USA, Q++]**, and because they fear stopping may result in a deterioration in their illness **[Lawn 2002, Australia, Q++; Lawn 2004, Australia, Q++]**.

ES 1.5 There is strong evidence to suggest smoking was a major priority in the lives of inpatients and outpatients with mental illness **[Lawn 2002, Australia, Q++; Snyder 2008, USA, Q++; Tsourtos 2011, Australia, Q++]**.

ES 1.6 There is strong evidence to suggest inpatients and outpatients perceive staff use cigarettes as a mechanism of control in inpatients settings **[Lawn 2002, Australia, Q++; Lawn 2004, Australia, Q++; Lucksted 2000, USA, Q++]**, in particular using them as a reward or punishment in order to control the patient's behaviour **[Lawn 2002, Australia, Q++; Lucksted 2000, USA, Q++]**.

Applicability: The evidence has direct applicability to the current UK settings and/or practices. Three of the studies were conducted in the UK **[Dickens 2005, England, S+; Edmonds 2007, England, Q++; Ratschen 2010b, England, Q++]**, and a further three were conducted in a country which was deemed to have similar applicability to that of the UK setting **[Lawn 2002, Australia, Q++; Lawn 2004, Australia, Q++; Tsourtos 2011, Australia, Q++]**.

2. Patients' views, attitudes and perceptions regarding making a quit attempt

Fifteen studies discussed the patients' views, attitudes and perceptions of quitting smoking. The theme is sub-divided into a) perceived barriers of making a quit attempt, and b) perceived facilitators to making a quit attempt.

A. Perceived barriers of making a quit attempt

In four studies of inpatients and outpatients, addiction to cigarettes was reported as a major barrier to quitting smoking **[Dickens 2005, England, S+; Green 2005, Canada, Q+; Goldberg 1996, Canada, MM++; Snyder 2008, USA, Q++]**, with patients reporting they were '*hooked on it*' **[Green 2005, Canada, Q+; Goldberg 1996, Canada, MM++]**, were '*addicted to nicotine*' **[Goldberg 1996, Canada, MM++]**, or expressed "*it's just too difficult to give up smoking"* **[Dickens 2005, England, S+]**. In particular, in one study, some outpatients reported nothing would motivate them to quit smoking, due to their severity of dependence on nicotine **[Goldberg 1996, Canada, MM++]**. Additionally, fear of nicotine withdrawal and the habitual nature of smoking were also identified as barriers to quitting in one study **[Goldberg 1996, Canada, MM++]**.

> "*I need something to knock it out of my mind completely."* **[Snyder 2008, USA, Q++]**
>
> *"It is your best friend… when I tried to quit, my thoughts go crazy and I start thinking about smoking cigarettes all the time."* **[Goldberg 1996, Canada, MM++]**
>
> "*After I have a cigarette, I say to myself, I've got to stop smoking, but it doesn't materialize. It's hard because it becomes a routine.*" **[Goldberg 1996, Canada, MM++]**
>
> "*Even if my live-in boyfriend asked me to quit or move out, I'd move out*" **[Goldberg 1996, Canada, MM++]**
>
> "*Even if the price went way up, I'd give up other things to still smoke*" **[Goldberg 1996, Canada, MM++]**

In three studies, inpatients and outpatients often reported they felt they were unable to quit smoking, primarily related to a lack of motivation and a sense of helplessness **[Goldberg 1996, Canada, MM++; Morris 2009, USA, Q+; Snyder 2008, USA, Q++]**.

> "*I was never able to quit longer than a few weeks. All three times I quit I really didn't have the desire to quit."* **[Snyder 2008, USA, Q++]**

Stress was also identified as a barrier to quitting by inpatients and outpatients in two studies **[Ratschen 2010b, England, Q++; Tsourtos, 2011, Australia, Q++]**.

> "*Smoking stresses my body but giving up increases stress to the max"* **[Tsourtos 2011, Australia, Q++]**

In two studies, inpatients and outpatients identified that the severity of mental health symptoms was a barrier to quitting smoking **[Mikhailovich 2008, Australia, MM-; Tsourtos 2011, Australia, Q++]**, due to having more "*downtimes"* **[Tsourtos 2011, Australia, Q++]**.

In three studies, inpatients and outpatients perceived there was little point in quitting smoking as this would have no direct effect on their recovery from their mental illness **[Lawn 2002, Australia, Q++]**, quality of life **[Ratschen 2010b, England, Q++]**, or health **[Snyder 2008, USA, Q++]**.

> "*I'm just not sure what else there is. What would I do with myself? I don't expect my current situation to be any different…. Seems like I've got an illness, like, it would be good to go wouldn't it. I wouldn't have the illness no more… Even if I did give up smoking, I've still got schizophrenia, haven't I?"* **[Lawn 2002, Australia, Q++]**

> "*Yes, but what would be the benefit of giving up? If it's important for me to give up smoking, I have to understand the reason why I should give up smoking. My quality of life won't change if I gave up. My life is sitting watching TV, sitting around, having teas, and then sleeping. There's no motivation to give up, is there?"* **[Ratschen 2010b, England, Q++]**

> "*I have a friend who doesn't smoke or drink, yet he coughs and coughs. He's a young guy, so I know it isn't just the smoking."* **[Snyder 2008, USA, Q++]**

Additionally, there was evidence from one study (setting unclear) that smokers with a psychotic disorder thought health concerns was less of a motivator for considering quitting than patients without a psychotic disorder **[Kelly 2010, USA, CC-]**.

In three studies, the smoking status of relatives, peers and staff was thought to be a major barrier to quitting smoking; where inpatients and outpatients expressed that they would find it difficult to stop smoking when their friends, families, and mental health staff continued to smoke around them **[Dickens 2005, UK, S+; Goldberg 1996, Canada, MM++; Morris 2009, USA, Q+]**. Additionally, in one study, outpatients perceived that the places where activities were available, such as club houses and drop-in centres, tended to condone smoking **[Morris 2009, USA, Q+]**.

> *"They [mental health providers] have to not smoke or they're not a good example for me. If they smoke, they've got nothing to tell me."* **[Morris 2009, USA, Q+]**

In three studies, outpatients identified that negative views and beliefs of staff were factors which determined their beliefs regarding quitting smoking **[Green 2005, Canada, Q+; Lawn 2002, Australia, Q++; Lucksted 2000, USA, Q++]**. Outpatients reported mental health staff were negative and judgmental about their smoking behaviour, which consequently increased the patients' sense of powerlessness **[Lawn 2002, Australia, Q++]**. Furthermore, outpatients reported staff actively

discouraged them stopping smoking due to the staffs' beliefs that it would increase worry and stress **[Lucksted 2000, USA, Q++]**. Additionally, outpatients reported being told by staff members that they should only contemplate quitting smoking towards the end of their life **[Green 2005, Canada, Q+]**.

> "*You have so many troubles, why worry about this one too?"* **[Lucksted 2000, USA, Q++]**
>
> *"It would be too stressful [to quit]."* **[Lucksted 2000, USA, Q++]**
>
> "*[You will] stop towards the end of [your] life*." **[Green 2005, Canada, Q+]**

A lack of knowledge regarding effective cessation strategies was discussed as a barrier to making a quit attempt in two studies **[Morris 2009, USA, Q+; Lucksted 2000, USA, Q++]**, with outpatients citing the need for structured patient education for smoking cessation, which detailed relevant information about smoking cessation interventions, such as NRT, issues relating to psychotropic medications and methods of minimising withdrawal symptoms **[Morris 2009, USA, Q+; Lucksted 2000, USA, Q++]**.

B. Perceived facilitators to making a quit attempt

The health effects of smoking was reported as a facilitator to making a quit attempt in six studies of inpatients and outpatients **[Dickerson 2011, USA, Q+; Goldberg 1996, Canada, MM++; Ratschen 2010b, England, Q++; Solty 2009, Canada, S+; Tidey 2009, USA, S-; Tsourtos 2011, Australia, Q++]**.

> "*I got fed up with it [smoking]. It causes lung cancer"*, *"I'd rather quit now than when I die. It's a nasty, dirty habit."* **[Dickerson 2011, USA, Q+]**
>
> "*Looking at a picture of blackened lungs and people who could only breathe with a respirator."* **[Goldberg 1996, Canada, MM++]**

However, in two studies, some outpatients reported that they would need to experience a negative health effect before they attempted to quit smoking **[Dickerson 2011, USA, Q+; Goldberg 1996, Canada, MM++]**.

> "*I had a bad cough and took a day off from smoking. I never smoked since."* **[Dickerson 2011, USA, Q+]**
>
> "*When I feel my health is going bad – it doesn't bother my throat much [now] and I smoke a lot.*" **[Goldberg 1996, Canada, MM++]**

Furthermore, in one study, outpatients believed they would need firm direction from their doctor before they would attempt to quit smoking **[Goldberg 1996, Canada, MM+]**.

> "*If I was told by my doctor that I couldn't smoke anymore or I'd die.*" **[Goldberg 1996, Canada, MM++]**

Peer, family and social pressures were cited as important facilitators to making a quit attempt in three studies of inpatients and outpatients **[Goldberg 1996, Canada, MM++; Kelly 2010, USA, CC-; Snyder 2008, USA, Q++]**, with patients reporting the need to reduce their smoking consumption due to family and social pressures to quit smoking (setting unclear) **[Kelly 2010, USA, CC-]**. However, in a further study, only a few current inpatient smokers who had made previous attempts to reduce their smoking consumption reported social and family pressure as a reason **[Solty 2009, Canada, S+]**.

> "*I think the government is trying to change the majority to the minority, and when you have the majority of people doing a certain thing, you're gonna choose to go with the majority.... If the majority of you guys didn't smoke cigarettes, I probably would not smoke. I would go with the majority."* **[Snyder 2008, USA, Q++]**

Additionally, in two studies, inpatients and outpatients reported they would find it easier to quit smoking if they had more social support to encourage them to stop smoking **[Goldberg 1996, Canada, MM++; Snyder 2008, USA, Q++]**.

> "*I would need to drag my momma, my grandmother, everybody, even my dog, to encourage me not to smoke."* **[Snyder 2008, USA, Q++]**

Patients reported their social environment was important factor related to whether they smoked or not; with inpatients reporting that they respected the rules of not smoking when they were in an environment where smoking was not allowed **[Snyder 2008, USA, Q++]**.

> "*It is interesting to me that I am able to not smoke for several weeks when I stay at my mom's house, but the minute I am back in my apartment, I light up."* **[Snyder 2008, USA, Q++]**

> "*A lot of time we recognise we don't need to smoke, like at church. We give respect to the place."* **[Snyder 2008, USA, Q++]**

Additionally, in one study, some outpatients reported the negative image of smoking motivated them to make a quit attempt **[Goldberg 1996, Canada, MM++]**.

> "*[I] didn't want to be the perfect picture of a psychiatric patient – they all smoke.*" **[Goldberg 1996, Canada, MM++]**

The cost of cigarettes was identified as an important facilitator to quitting smoking in four studies of inpatients and outpatients **[Dickerson 2011, USA, Q+; Goldberg 1996, Canada, MM++; Ratschen 2010b, England, Q++; Solty 2009, Canada, S+]**. Outpatients who were former smokers reported the cost of cigarettes was a major facilitator for motivating them to quit **[Dickerson 2011, USA, Q+; Goldberg 1996, Canada, MM++]**, and inpatient's who were current smokers reported cost as one of the major reasons for initiating past attempts to reduce their cigarette consumption **[Solty 2009, Canada, S+]**.

In three studies, outpatients identified that a positive attitude would be needed before initiating a quit attempt otherwise the attempt would definitely fail **[Morris 2009, USA, Q+; Edmonds 2007, England, Q++; Lucksted 2000, USA, Q++]**. In particular, in one study, outpatients identified the importance of using pharmacological treatments in combination with motivation, information and sustained support to enhance the success of a quit attempt **[Lucksted 2000, USA, Q++]**.

In a further study, outpatients believed they should be educated in the harmful effects of tobacco use versus the potential benefits of symptoms control for their mental illness **[Morris 2009, USA, Q+]**. However, in a study conducted in the UK, the majority of inpatients thought they received sufficient information regarding giving up smoking, and the staff on the wards were thought to be supportive **[Dickens 2005, England, S+]**.

In one study, outpatients thought they would only try to quit smoking if the process could be done 'painlessly' **[Lawn 2002, Australia, Q++]**.

> *"I'd like them to take me to hospital for 3 to 4 days and tie me down and give me a sleeping drug for that time and I'd probably wake up and not want a smoke… To quit I think I'd need the magic pill."* **[Lawn 2002, Australia, Q++]**.

EVIDENCE STATEMENTS

ES 2.1 There is strong evidence to suggest inpatients and outpatients perceive nicotine addiction as a major barrier to making a quit attempt **[Dickens 2005, England, S+; Green 2005, Canada, Q+; Goldberg 1996, Canada, MM++; Snyder 2008, USA, Q++]**.

ES 2.2 There is strong evidence to suggest inpatients and outpatients consider they are unable to quit smoking, primarily related to a lack of motivation **[Goldberg 1996, Canada, MM++; Morris 2009, USA, Q+; Synder 2008, USA, ++]**. There was moderate evidence to suggest inpatients and outpatients perceive stress **[Tsourtos, 2011, Australia, ++]**, and the severity of their mental health symptoms **[Mikhailovich 2008, Australia, MM-; Tsourtos 2011, Australia, Q++]** as barriers to quitting smoking.

ES 2.3 There is moderate evidence to suggest some inpatients and outpatients perceived there was little point in quitting smoking as this would have no direct effect on their recovery from their

mental illness **[Lawn 2002, Australia, Q++]**, improve their quality of life **[Ratschen 2010b, England, Q++]**, or health **[Snyder 2008, USA, Q++]**.

ES 2.4 There is strong evidence to suggest inpatients' and outpatients' perceive the influence of peer, family, and social pressure as important barriers to quitting, with patients perceiving it difficult to quit smoking when peers, family, and staff members smoke around them **[Dickens 2005, England, S++; Goldberg 1996, Canada, MM++; Morris 2009, USA, Q+]**.

ES 2.5 There is strong evidence to suggest outpatients perceive the negative views and beliefs of staff as important barriers to quitting smoking **[Green 2005, Canada, Q+; Lawn 2002, Australia, Q++; Lucksted 2000, USA, Q++]**.

ES 2.6 There is moderate evidence from the USA to suggest outpatients perceive they have a lack of knowledge regarding which strategies are effective for smoking cessation **[Morris 2009, USA, Q+; Lucksted 2000, USA, Q++]**; with outpatients requesting the need for structured patient education, which detailed relevant information about smoking cessation interventions, issues relating to psychotropic medications and methods of minimising withdrawal symptoms **[Morris 2009, USA, Q+; Lucksted 2000, USA, Q++]**

ES 2.7 There is mixed evidence regarding the impact of the patients' physical health on quitting smoking, with strong evidence to suggest inpatients' and outpatients' with mental illness perceived worrying about their physical health was a facilitator to quitting smoking **[Dickerson 2011, USA, Q+; Goldberg 1996, Canada, MM++; Ratschen 2010b, England, Q++; Solty 2009, Canada, S+; Tidey 2009, USA, S-; Tsourtos 2011, Australia, Q++]**. However, there is moderate evidence to suggest that outpatients would need to experience a negative health effect of smoking before they would consider quitting **[Dickerson 2011, USA, Q+; Goldberg 1996, Canada, MM++]**.

ES 2.8 There is strong evidence to suggest inpatients' and outpatients' perceive the influence of peer, family, and social pressures to quit smoking as important facilitators to quit **[Goldberg 1996, Canada, MM++; Kelly 2010, USA, CC-; Snyder 2008, USA, Q++]**.

ES 2.9 There is strong evidence to suggest inpatients and outpatients perceive the high cost of cigarettes as a major facilitator to quitting smoking **[Dickerson 2011, USA, Q+; Goldberg 1996, Canada, MM++; Ratschen 2010b, England, Q++; Solty 2009, Canada, S+]**.

ES 2.10 There is moderate evidence to suggest outpatients' perceived they would need to have a positive attitude regarding the success of their quit during a quit attempt to maximise success **[Morris 2009, USA, Q+; Edmonds 2007, England, Q++]**.

Applicability: The evidence has direct applicability to the current UK settings and/or practices. Three of the studies were conducted in the UK **[Dickens 2005, England, S+; Edmonds 2007, England, Q++; Ratschen 2010b, England, Q++],** and a further three were conducted in a country which was deemed to have similar applicability to that of the UK setting **[Lawn 2002, Australia, Q++; Mikhailovich 2008, Australia, MM-; Tsourtos 2011, Australia, Q++]**.

3. Patients' views, attitudes and perceptions regarding successfully quitting

Eleven studies and one review discussed the patients' views, attitudes and perceptions regarding successful quitting. This theme is sub-divided into a) perceived barriers of successfully quitting, b) perceived facilitators to successfully quitting, c) outcomes following successfully quitting, and d) suggested interventions for smoking cessation.

A. Perceived barriers of successfully quitting

A literature review of primary studies reported patients with mental illness tended to perceive NRT was not effective for smoking cessation **[Williams 2011, Review, -]**, and this was discussed in two studies of inpatients **[Scherer unpublished, Brazil, MM+; Ratschen 2010b, England, Q++]**.

> *"Many do not believe that NRT improves a smoker's chance of quitting despite an abundance of evidence to the contrary… These same barriers are even greater in the mental health system."* **[Williams 2011, Review, -]**

> "*I believe that the patch does not work, it doesn't solve anything.*" *(inpatient)* **[Scherer unpublished, Brazil, MM+]**

> "*I think it [NRT] doesn't solve anything, a medicine that made you feel disgust would be better.*" *(relative)* **[Scherer unpublished, Brazil, MM+]**

Additionally, in one study, some inpatients described that using NRT made them smoke more and were therefore reluctant to use NRT for smoking cessation **[Ratschen 2010b, England, Q++]**.

> "*Last time I went on patches I smoked three times as much – I don't know why."* **[Ratschen 2010b, England, Q++]**

Furthermore, some inpatients in one study reported they would not take any smoking cessation medication in addition to that for their mental illness **[Ratschen 2010b, England, Q++]**.

> *"I don't know what they've got on the market now, but I wouldn't want to take any medication, but I would try the patches or inhalers."* **[Ratschen 2010b, England, Q++]**

Additionally, the use of unsupported quit attempts was discussed in one study of inpatients; half of current smokers reported they would initially try to quit on their own, and the majority of former smokers said they had successfully quit smoking on their own **[Solty 2009, Canada, S+]**.

The literature review also reported that some smokers believed pharmacological interventions for smoking cessation which contained nicotine would be more harmful than smoking cigarettes **[Williams 2011, Review, -]**.

> "*Smokers are often mis-informed, mistakenly believing that nicotine is a carcinogen and that NRT poses more cardiovascular threat than smoking."* **[Williams 2011, Review, -]**

The cost of NRT was reported by outpatients as a major barrier for its use as a smoking cessation intervention **[Lawn 2002, Australia, Q++]**; however, in a further study outpatients were not aware that NRT could be received on prescription and so would have been free for those entitled to free prescriptions **[Edmonds 2007, England, Q++]**.

In one UK study, outpatients generally had quite negative views regarding attending group behavioural support and perceived the group format would not be as effective for quitting smoking as compared to one to one support **[Edmonds 2007, England, Q++]**.

> *"I don't do well in big groups. I get a little bit pensive. I wouldn't have been able to handle that. Too much stress for nothing. Which would make me want to go outside for a cigarette."* **[Edmonds 2007, England, Q++]**

> *"I did have this little picture of going into one of these groups, where you all sit around, a bit like AA [Alcoholics Anonymous]. I did have a thought that I might end up in one of those."* **[Edmonds 2007, England, Q++]**

Additionally, in one UK study, some inpatients felt that an inpatient setting was not a suitable environment to be given smoking cessation support **[Ratschen 2010b, England, Q++]**.

> "*No [I would not attend a support programme on the inpatient ward] because if I wanted to give up I would…. I'm only smoking a lot because I'm in hospital."* **[Ratschen 2010b, England, Q++]**

In one study, inpatients and outpatients identified that some smokers with mental illnesses may have difficulties accessing smoking cessation programmes, for example, due to needing to use public transport **[Mikhailovich 2008, Australia, MM-]**.

B. Perceived facilitators to successfully quitting

The effectiveness of NRT as a smoking cessation intervention was discussed in five studies **[Dickens 2005, England, S+; Edmonds 2007, England, Q++; Lawn 2002, Australia, Q++; Ratschen 2010b, England, Q++; Solty 2009, Canada, S+]**, with inpatients from three studies perceiving NRT to be the most beneficial intervention to help them quit smoking **[Dickens 2005, UK, S+; Ratschen 2010b, England, Q++; Solty 2009, Canada, S+]**.

In four studies, inpatients and outpatients discussed the role of behavioural support as an intervention for smoking cessation **[Dickerson 2011, USA, Q+; Edmonds 2007, England, Q++; Morris 2009, USA, Q+; Ratschen 2010b, England, Q++]**, with outpatients reporting they would have found the option of using behavioural support interventions useful during their quit attempts **[Dickerson 2011, USA, Q+; Edmonds 2007, England, Q++]**.

> "*It's got to be a one to one for you to be able to get it through your head."* **[Edmonds 2007, England, Q++]**

In one UK study, outpatients in the study thought it was important that they were able to dictate how many sessions of behavioural support they received as part of the smoking cessation support **[Edmonds 2007, England, Q++]**.

> "*It all needs to be all free option, as many options as possible, and people to choose."* **[Edmonds 2007, England, Q++]**

The setting of behavioural smoking cessation support was reported an influential factor in quitting in one study **[Edmonds 2007, England, Q++]**, with outpatients reporting the need for the support to be delivered in an informal and non-clinical environment.

> "*It felt informal, not like you were going to a clinic or anything like that or any kind of rehab. It is like a homely environment.*" **[Edmonds 2007, England, Q++]**

> "*Going to a group or the hospital or somewhere like that… would have been a bit anxious about that."* **[Edmonds 2007, England, Q++]**

> "*…the home environment is much better… a mentally ill patient has to keep going to these meeting and seeing psychiatrists and doctors and nurses and it's all pressure… whereas when it's in your own environment, you're relaxed and you feel more inclined to ask the right questions, whereas when you have to go and see a psychiatrist or a nurse or whatever or a doctor, you're nervous and you don't ask the same questions, you forget the questions that you were going to ask and you don't get the same result. You just don't get the same result."* **[Edmonds 2007, England, Q++]**

In one UK study, outpatients expressed the opinion that the behavioural support offered to them should be tailored to their needs as a patient with mental illness **[Edmonds 2007, England, Q++]**.

> *"Because they are actually taking your personal care into consideration and it is different if you have a mental health problem, the smoking issues, compared to being in the general public, I just feel that having an extra support like that was really good… it's just like being treated like an individual and not like the herd thing, being listened to and being supported is*

> *just much better than the general way of doing it for most people I think."* **[Edmonds 2007, England, Q++]**

In two studies, outpatients identified the need for smoking cessation support to involve peer support through the involvement of either one or more persons with a history of mental illness who had successfully quit smoking **[Dickerson 2011, USA, Q+; Morris 2009, USA, Q+]**.

> "*…maybe a peer advocate, maybe somebody that's smoked and quit smoking and they have ideas of how they dealt with stress at that time and how they deal with it now."* **[Morris 2009, USA, Q+]**

> *"I think support groups would be helpful. The more people that are trying to quit you can feed off each other's need to quit, or motivation to quit."* **[Morris 2009, USA, Q+]**

In one study, outpatients described the importance for the staff supporting the patient to quit smoking to be able to have a balance between taking a non-judgmental approach to quitting **[Edmonds 2007, England, Q++]**, whilst being able to maintain a positive expectation in the patient's ability to quit smoking **[Morris 2009, USA, Q+]**.

> "*He was saying that even if you didn't manage to make it, it wasn't really a failure, you could just try again …. Watch out for when you make mistakes again."* **[Edmonds 2007, England, Q++]**

Additionally, outpatients reported a major facilitator to quitting was that the smoking cessation advisor had confidence in them being successful **[Edmonds 2007, England, Q++]**.

> "[*The advisor] had a lot of confidence in me and I think that was what I needed"* **[Edmonds 2007, England, Q++]**

In particular, outpatients thought a major facilitator to the success of their quit attempt was related to the staff acting as an advocate during the quit attempt **[Edmonds 2007, England, Q++]**.

> "*Well, she was very helpful with the chemist. My chemist isn't very helpful and …. she was very supportive with him, no, to me, for letting him know that this particular drug was what she had asked for, and that particular drug was what she wants me to have and that this other one which was 10 pounds cheaper wasn't the one she wanted, and that's what she told him. And she told him that she wanted a month's supply, … not just a week's and then stop, which is what he was doing and …. She soon sorts people out."* **[Edmonds 2007, England, Q++]**

Furthermore, in one study, outpatients identified the importance of the smoking cessation advisor having a good knowledge of mental health problems, and how smoking and quitting can impact on their mental health **[Edmonds 2007, England, Q++]**.

> *"It was helpful not having to explain about being ill because, it was almost as if she understood…it's not a nice place to be without having to explain it to people, so I think that the fact that there are people that can help you stop smoking who know about mental health issues is helpful."* **[Edmonds 2007, England, Q++]**

C. Outcomes following successfully quitting

In one study, outpatients reported successfully quitting improves their mental health and relationships with others through a sense of achievement and increased communication with others **[Edmonds 2007, England, Q++]**.

> *"I feel really proud of myself."* **[Edmonds 2007, England, Q++]**

> "*Found we sat and talked quite a lot a more… I'd say it has been positive experience*." **[Edmonds 2007, England, Q++]**

Additionally, in an evaluation of a smoking cessation programme, inpatients' with mental health conditions were noted to form new social activity groups as they quit smoking **[Mikhailovich 2008, Australia, MM-]**.

> "*…also formed a social group to walk together or play cards."* **[Mikhailovich 2008, Australia, MM-]**

D. Suggested interventions for smoking cessation

The use of monetary incentives as rewards for achieving smoking cessation was discussed in two studies **[Goldberg 1996, Canada, MM++; Kelly 2010, USA, CC-]**. In one study, outpatients reported they would be more motivated to attempt to quit smoking if they were paid **[Goldberg 1996, Canada, MM++]**; however, in another study immediate reinforcements and rewards were significantly less likely to be a major motivators for considering smoking cessation in patients with schizophrenia as compared to controls without psychotic disorders (setting unclear) **[Kelly 2010, USA, CC-]**.

The role of cutting down on cigarettes was discussed in two studies **[Lawn 2002, Australia, Q++; Ratschen 2010b, England, Q++]**. In one study, outpatients perceived they would find it easier to achieve success if their goal was to cut down on their smoking rather than aiming for complete smoking cessation, so they were able to continue to use the nicotine from the cigarettes, albeit at lower levels, as a form of self-medication **[Lawn 2002, Australia, Q++]**. However, other outpatients

in the study reported cutting down would not be an appropriate goal for them due to the temptation of still having access to cigarettes **[Lawn 2002, Australia, Q++]**.

In the second study, some inpatients were not aware that NRT could be used as to reduce smoking **[Ratschen 2010b, England, Q++]**. Additionally, some of the inpatients stated cutting down their cigarette consumption could be of interest to them **[Ratschen 2010b, England, Q++]**.

> *"Just reduce smoking really, because I'm not bothered how much I smoke, but while I'm on the ward I do worry about it, because I haven't got much money to keep buying cigarettes and toiletries, and when I leave I have to find accommodation, and I have to sacrifice something, and sacrificing cigarettes is better than sacrificing my toiletries or food or anything."* **[Ratschen 2010b, England, Q++]**

EVIDENCE STATEMENTS

ES 3.1 There is moderate evidence from Brazil and England to suggest inpatients' perceive NRT as not effective for smoking cessation **[Scherer unpublished, Brazil, MM+; Ratschen 2010b, England, Q++]**; however, there is moderate evidence from UK and Canadian studies to suggest that some inpatients' perceived NRT to be the most beneficial intervention to help them quit smoking **[Dickens 2005, UK, S+; Ratschen 2010b, England, Q++; Solty 2009, Canada, S+]**. There is moderate evidence from England to suggest some inpatients would prefer not to take further medications than those they were already taking for their mental illness **[Ratschen 2010b, England, Q++]**.

ES 3.2 There is moderate evidence from Australia to suggest outpatients perceived the cost was a barrier to using NRT for smoking cessation **[Lawn 2002, Australia, Q++]**; and moderate evidence from England to suggest outpatients were not aware that NRT could be received on prescription and so would have been free for those entitled to free prescriptions **[Edmonds 2007, England, Q++]**.

ES 3.3 There is moderate evidence from England to suggest that outpatients perceived the group format for behavioural therapy would not be as effective as using an individual (one-to-one) format **[Edmonds 2007, England, Q++]**.

ES 3.4 There is moderate evidence from England to suggest that inpatients perceived providing smoking cessation support in a hospital inpatient setting would not be the most suitable environment **[Ratschen 2010b, England, Q++]**.

ES 3.5 There is moderate evidence to suggest outpatients' would have found the option of using behavioural support interventions useful during their quit attempts **[Dickerson 2011, USA, Q+; Edmonds 2007, England, Q++]**.

ES 3.6 There is moderate evidence from England and the USA to suggest outpatients who had successfully quit perceived the following as important facilitators to successfully quitting: i) being able to dictate how many sessions of behavioural support they received **[Edmonds 2007, England, Q++]**, ii) the option to have the support in an informal and non-clinical environment **[Edmonds 2007, England, Q++]**, iii) receiving cessation support that is tailored to their needs as patients with mental

illness **[Edmonds 2007, England, Q++]**, and iv) having the support involve either one or more persons with a history of mental illness who had successfully quit smoking **[Dickerson 2011, USA, Q+; Morris 2009, USA, Q+]**.

ES 3.7 There is moderate evidence from England and the USA to suggest that outpatients perceive having a supportive smoking cessation advisor is an important facilitator to successfully quitting **[Edmonds 2007, England, Q++; Morris 2009, USA, Q+]**. In particular, they described the importance that the smoking cessation advisor should i) take a non-judgmental approach to quitting **[Edmonds 2007, England, Q++]**, whilst being able to maintain a positive expectation in the patient's ability to quit smoking **[Morris 2009, USA, Q+]**, ii) act as an advocate during the quit attempt **[Edmonds 2007, England, Q++]**, and iii) have a good knowledge of mental health problems, and how smoking and quitting can impact on their mental health **[Edmonds 2007, England, Q++]**.

ES 3.8 There is moderate evidence from the USA and Canada to suggest outpatients' perceive monetary incentives could be an effective intervention for smoking cessation **[Goldberg 1996, Canada, MM++; Kelly 2010, USA, CC-]**.

ES 3.9 There is moderate evidence to suggest some inpatients' and outpatients' perceive they would find it easier to achieve success if their goal was to cut down on their smoking rather than aiming for complete smoking cessation **[Lawn 2002, Australia, Q++; Ratschen 2010b, England, Q++]**.

ES 3.10 There is weak evidence to suggest inpatients' and outpatients' perceived quitting smoking resulted an improvement in communication with others and in forming new peer groups **[Edmonds 2007, UK, ++; Mikhailovich 2008, Australia, MM-]**.

Applicability: The evidence has direct applicability to the current UK settings and/or practices. Three of the studies were conducted in the UK **[Dickens 2005, England, S+; Edmonds 2007, England, Q++; Ratschen 2010b, England, Q++]**, and a further two studies were conducted in a country which was deemed to have a similar applicability to the UK setting **[Lawn 2002, Australia, Q++; Mikhailovich 2008, Australia, MM-]**.

QUESTION 1B. WHAT ARE THE VIEWS (KNOWLEDGE, ATTITUDES, AND BELIEFS) OF THE SERVICE PROVIDERS WITHIN THE NHS STOP SMOKING SERVICES AND MENTAL HEALTH STAFF WITHIN HOSPITALS, OUTPATIENT CLINICS AND THE COMMUNITY, INCLUDING INTENSIVE SERVICES IN PSYCHIATRIC UNITS AND SECURE HOSPITALS?

Thirty-two studies, one review and two discussion pieces reported the views of service providers regarding the barriers and facilitators that affect the delivery of effective smoking cessation and temporary abstinence interventions in the population of interest **[Ashton 2010; Campion 2008; Dickens 2004; Essenmacher 2008; Edmonds 2007; Landow 1995; Lawn 2004; Lawn 2006; Lubman 2006; McNally 2010; Morris 2009; O'Donovan 2009; Parker 2012, Price 2007a, Price 2007b; Prochaska 2005; Prochaska 2006; Ratschen 2009a, Ratschen 2009, Ratschen 2010a, Sarna 2009; Scherer unpublished; Sharp 2009; Secker-Walker 1994; Sidani 2011; Stubbs 2004; Tong 2010; Weinberger 2008; Williams 2009; Williams 2011; Wye 2009; Wye 2010; Ziedonis 1997; Zvolensky 2005]**. The methods and findings of the primary studies and the critical review are presented briefly in Table 3.

Table 3 Characteristics of included studies – Staff views (knowledge, attitudes and beliefs)

Author, year, quality	Aim of the study	Method, population, and setting	Location
Author: Ashton **Year**: 2010 **Quality**: +	To assess mental health workers' attitudes to addressing patients' tobacco use and to identify any perceived barriers that prevent people with mental illness from receiving the support they require to tackle tobacco use	**Method**: Survey **Population**: Adult mental health workers **Sample size**: 324 **Setting**: Inpatient and community	Australia
Author: Dickens **Year**: 2004 **Quality**: +	To examine differences in attitudes and beliefs about smoking between nurses and other professional groups in a mental health setting	**Method**: Survey **Population**: Nurses and health professionals **Sample size**: 690 **Setting**: Inpatient	England
Author: Edmonds **Year**: 2007 **Quality**: ++	To examine the process of mental health professionals offering stop smoking support, exploring the experiences and perceptions of the participants in the one to one stop smoking intervention	**Method**: Evaluation and patient interviews **Population**: Mental health professionals **Sample size**: 40 **Setting**: Community	England
Author: Essenmacher **Year**: 2008 **Quality**: +	To determine staff's characteristics that are associated with attitudes about providing cessation services to veteran patients with psychiatric illness	**Method**: Survey and interviews **Population**: Clinical and non-clinical staff members **Sample size**: 150 in survey, 8 interviews **Setting**: Inpatient	USA
Author: Landow **Year**: 1995 **Quality**: -	To learn how physicians approach the problem of high smoking rates in psychiatric populations	**Method**: Survey **Population**: Mental health professionals **Sample size**: 128 **Setting**: Unclear	USA
Author: Lawn **Year**: 2004 **Quality**: ++	To compare experiences from two psychiatric institutions regarding smoking related problems	**Method**: Ethnographic **Population**: Ward staff **Sample size**: Not reported **Setting**: Inpatient	Australia
Author: Lawn **Year**: 2006 **Quality**: ++	To investigate the ethical thinking of a small sample of nurses with regard to smoking by mentally ill patients, in an attempt to understand and propose some reasons why psychiatric nurses have not been as influential as expected in smoking cessation in psychiatric settings	**Method**: Interviews **Population**: Nurses **Sample size**: 7 **Setting**: Inpatient and community	Australia
Author: Lubman **Year**: 2007 **Quality**: -	Psychiatrists should assess the smoking status of all patients, including their level of nicotine dependence and readiness to quit	**Method**: Survey **Population**: Psychiatrists and general practitioners **Sample size**: Approximately 600 psychiatrists and 480 general practitioners **Setting**: Community	Australia
Author: McNally **Year**: 2010 **Quality**: +	To examine whether smoking cessation services are following guidance on delivery of services to patients with mental illness	**Method**: Survey and interviews **Population**: NHS Stop Smoking Services staff **Sample size**: 27	England

		Setting: Community	
Author: Morris **Year**: 2009 **Quality**: +	To understand the factors that impede and support tobacco cessation efforts from the perspective of both community mental health patients and providers	**Method**: Focus groups **Population**: Mental health administrators **Sample size**: 19 **Setting**: Community	USA
Author: O'Donovan **Year**: 2009 **Quality**: +	To examine nurses' smoking prevalence and their role in smoking cessation, particularly their attitudes towards health promotion	**Method**: Survey **Population**: Nurses **Sample size**: 430 **Setting**: Inpatient	South Ireland
Author: Parker **Year:** 2012 **Quality:** +	To implement a tailored tobacco dependence service in mental health settings and assess its impact, and barriers and facilitators to implementation	**Method:** Mixed methods **Population:** Mental health professional advisers supporting patients and staff who are smokers **Sample size:** Two advisors reporting on barriers and facilitators relating to 2038 community patients and 4 acute and 2 rehabilitation wards containing a total of 129 beds **Setting:** Inpatient and community	England
Author: Price **Year**: 2007a **Quality**: -	To explore psychiatrists'' perceptions and practices relating to treating smoking in patients, and to examine whether these perceptions and practices varied by psychiatrists' characteristics	**Method**: Survey **Population**: Psychiatrists **Sample size**: 78 **Setting**: Community	USA
Author: Price **Year**: 2007b **Quality**: +	Practice and perceptions of smoking cessation activities among child and adolescent psychiatrists	**Method**: Survey **Population**: Psychiatrists **Sample size**: 184 **Setting**: Community	USA
Author: Prochaska **Year**: 2005 **Quality**: +	To assess the need for and interest in tobacco cessation curricula in psychiatric residency training	**Method**: Survey **Population**: Psychiatry residents **Sample size**: 105 **Setting**: Inpatient	USA
Author: Prochaska **Year**: 2006 **Quality**: +	To evaluate, in a national survey of residency training directors, the need for and interest in tobacco cessation training in psychiatry residency programs	**Method**: Survey **Population**: Residency training directors **Sample size**: 114 **Setting**: Inpatient	USA
Author: Ratschen **Year**: 2009a **Quality**: ++	To investigate staff knowledge and attitudes relating to smoking prevalence, dependence, treatment and the relationship between smoking and mental illness	**Method**: Survey **Population**: Mental health trust staff **Sample size**: 459 **Setting**: Inpatient	England
Author: Ratschen **Year**: 2009b **Quality**: +	To explore the practical implications of, and problems arising from, the implementation of a comprehensive smoke-free policy	**Method**: Interviews **Population**: Ward staff **Sample size**: 16	England

		Setting: Inpatient	
Author: Sarna **Year**: 2009 **Quality**: -	To describe frequency of psychiatric nurses' self-reported interventions to address smoking, and to explore associations between nurses' demographic and professional characteristics and awareness of Tobacco Free Nurses and the 5A's	**Method**: Survey **Population**: Nurses **Sample size**: 100 **Setting**: Inpatient	USA
Author: Scherer **Year**: Unpublished **Quality**: +	To assess the opinions of hospitalised patients, their relatives, and care team members about tobacco use in the hospitalised environment and smokers' dependence levels	**Method**: Survey and interviews **Population**: Care team staff **Sample size**: 48 **Setting**: Inpatient	Brazil
Author: Secker-Walker **Year**: 1994 **Quality**: +	To assess and compare the smoking cessation counselling activities of different health professional groups	**Method**: Survey **Population**: Mental health counsellors **Sample size**: 80 **Setting**: Community	USA
Author: Sharp **Year**: 2009 **Quality**: +	To assess psychiatric nurses' perspectives concerning tobacco dependence intervention	**Method**: Survey **Population**: Psychiatric nurses **Sample size**: 1381 **Setting**: Inpatient and community	USA
Author: Sidani **Year**: 2011 **Quality**: +	To examine the smoking cessation beliefs of clinical mental health counsellors and their practices with clients	**Method**: Survey **Population**: Clinical mental health counsellors **Sample size**: 330 **Setting**: Inpatient and community	USA
Author: Stubbs **Year**: 2004 **Quality**: +	To examine staff views on smoking at work in a large psychiatric hospital	**Method**: Survey **Population**: Ward staff **Sample size**: 599 **Setting**: Inpatient	England
Author: Tong **Year**: 2010 **Quality**: +	To describe the smoking prevalence, smoking cessation practices, and beliefs for multiple types of mental health professionals, and factors associated with self-reported delivery of tobacco dependence treatments	**Method**: Survey **Population**: Mental health professionals **Sample size**: 2804 (of which 400 psychiatrists) **Setting**: Inpatient and community	USA
Author: Weinberger **Year**: 2008 **Quality**: -	To examine the attitudes of clinicians regarding smoking cessation for psychiatric and substance abusing patients	**Method**: Survey **Population**: Mental health clinicians **Sample size**: 34 **Setting**: Inpatient	USA
Author: Williams **Year**: 2009 **Quality**: +	To develop and implement a 2-day continuing education curriculum called "Treating Tobacco Dependence in Mental Health Setting"	**Method**: Survey **Population**: Mental health workers **Sample size**: 71 **Setting**: Inpatient and community	USA
Author: Williams **Year**: 2011 **Quality**: -	To describe the reasoning behind the development of the comprehensive model for Mental Health Tobacco Recovery programme	**Method**: Review **Population**: N/A **Sample size**: N/A	USA

		Setting: Unclear	
Author: Wye **Year**: 2009 **Quality**: ++	To identify smoking policies and procedures in public psychiatric inpatient units	**Method**: Survey **Population**: Nurse/unit managers **Sample size**: 123 **Setting**: Inpatient	USA
Author: Wye **Year**: 2010 **Quality**: ++ (N.B. Same study as Wye 2009)	To describe the views of nurse managers regarding the provision of nicotine dependence treatment, and factors that nurse managers perceive to be determinants of nicotine dependence treatment provision	**Method**: Survey **Population**: Nurse/unit managers **Sample size**: 123 **Setting**: Inpatient	USA
Author: Ziedonis **Year**: 1997 **Quality**: -	An evaluation of a smoking cessation programmes for smokers with schizophrenia	**Method**: Programme evaluation **Population**: N/A **Sample size**: 24 **Setting**: Community	USA
Author: Zvolensky **Year**: 2005 **Quality**: -	To gauge the degree of basic cessation counselling provided by practitioners specialising in anxiety treatment disorders	**Method**: Survey **Population**: Mental health staff **Sample size**: 75 **Setting**: Inpatient and community	USA

The findings of the studies are presented below based on themes and sub-themes relating to barriers and facilitators, with quotes to support the themes where possible.

The themes relating to the perceived barriers and facilitators are presented below in Table 4.

Table 4 Synthesis framework for views of staff

Theme	Subthemes	Number of studies discussing theme
Staff attitudes and beliefs regarding smoking in patients	Smoking as a personal choice Smoking as a means of self-medication Smoking as shared activity to build rapport Cigarettes as a mechanism of control	12
Staff attitudes towards smoking cessation in patients	Negative beliefs regarding quitting Positive beliefs regarding quitting Influence of staff smoking status on patients Roles and responsibilities of staff in quitting Perceived impact of quitting on mental illness	24
Perceived barriers and facilitators to quitting in patients	Motivation, nicotine dependence, psychosocial, and environmental factors	8
Staff skills and abilities	Confidence in providing smoking cessation support Adequacy of training	18
Staff perceptions of systems and policies	Priority of smoking cessation Time and other resources	15
Staff perceptions regarding interventions for smoking cessation in patients	Perceived effectiveness and safety of interventions Awareness of staff of services Lack of re-imbursement Information and accessibility of support for patients Other factors reported to influence the provision of interventions for smoking cessation	16

1. Staff attitudes and beliefs regarding smoking in patients

Twelve studies and one discussion piece discussed staff attitudes to smoking. The theme is sub-divided into a) smoking as a personal choice, b) smoking as shared activity to build rapports, and c) cigarettes as mechanisms of control.

A. Smoking as a personal choice

In six studies, clinical and non-clinical staff thought tobacco use was a personal choice of the patient **[Ashton 2010, Australia, S+; Dickens 2004, England, S+; Essenmacher 2008, USA, MM+; Lawn 2004, Australia, Q++; Lawn 2006, Australia, Q++; Williams 2009, USA, S+]**.

> *"If they choose to."*, *"Up to the individual."*, "*They are adults and can decide for themselves."* **[Dickens 2004, England, S+]**

In one study, nursing staff expressed the view that the patients shouldn't have to alter their smoking behaviour following admission to a psychiatric setting **[Lawn 2006, Australia, Q++]**.

> "*I just think everyone has got the right to choose to do what they want to do…. They were smoking before they were detained so what rights have we to stop them from smoking once they're detained."* **[Lawn 2006, Australia, Q++]**

Nurses and ward staff expressed views that they thought patients smoked because they enjoyed smoking and found it pleasurable **[Lawn 2006, Australia, Q++]**, smoking relieved boredom **[Ratschen 2009b, England, Q+; Lawn 2006, Australia, Q++]**, and staff didn't believe that smoking should be denied **[Lawn 2006, Australia, Q++]**.

> "*When they're [on the locked wards], they've got so little anyway, that's one of the pleasures that they've got."* **[Lawn 2006, Australia, Q++]**

> "*I have the impression with those patients that, often, they are really fixated on the nicotine, and they look forward to going to smoke, and it's one of their main things in life."* **[Ratschen 2009b, England, Q+]**

In two studies, ward staff perceived patients with severe mental illness to have very little to look forward to **[Lawn 2004, Australia, Q++]**, and it was used as a coping mechanism as it was "the one thing" to look forward to when everything else that used to be familiar to them couldn't be accessed following admission as an inpatient **[Ratschen 2009b, England, Q+]**.

> "*In my hearts of hearts, with patients with schizophrenia, I feel that they haven't got much left for them, so good luck to them. If they want to smoke, let them."* **[Lawn 2004, Australia, Q++]**

In three studies, nurses, mental health administrators, and ward staff also believed cigarettes were a priority in many patients' lives, and were prioritized over other concerns **[Lawn 2006, Australia, Q++; Morris 2009, USA, Q+; Ratschen 2009a, England, S++]**.

> "*They [mental health consumers] don't care how much they spend on cigarettes. Their cigarettes are so important to them, it doesn't matter."* **[Morris 2009, USA, Q+]**

Additionally, a survey of 123 unit managers thought patients with mental health conditions usually have enough problems without having the additional worry regarding their smoking **[Wye 2010, Australia, S++]**.

B. Smoking as a means of self-medication

In two studies, there was the perception from nursing and ward staff that cigarettes were administered as a means of self-medication, to control symptoms of mental illness **[Ratschen 2009a, England, S++; Lawn 2006, Australia, Q++]**.

C. Smoking as shared activity to build rapport

In two studies, nursing and ward staff reported that smoking was used as a means of developing a rapport with the patients **[Lawn 2004, Australia, Q++; Lawn 2006, Australia, Q++]**.

> "*Part of working with really difficult clients is trying to find an entry point where you can develop rapport with them. And what was more easy than sitting around with them and having a smoke."* **[Lawn 2004, Australia, Q++]**

However, in a survey of 123 unit managers, only a minority of them agreed or strongly agreed that it is sometimes useful for staff to smoke with a patient to build rapport or trust (30%) **[Wye 2010, Australia, S++]**.

D. Cigarettes as a mechanism of control

In three studies, nursing and ward staff and mental health administrators described smoking had been and is still currently used by staff as a behavioural reward **[Lawn 2004, Australia ++; Lawn 2006, Australia, Q++; Morris 2009, USA, Q+]**; including being used as a reward or punishment for adherence to treatment medications **[Ratschen 2010a, Discussion piece]**, and as currency in inpatient settings **[Lawn 2006, Australia, Q++]**.

> "*If you wanted the patient to do something, you could give them a cigarette and they'd probably do it. In fact, I can remember my first ward, the charge sister saying, 'Go and run this errand and I'll give you a cigarette. Go and make your bed and I'll give you a cigarette…' It was how you go things done."* **[Lawn 2006, Australia, Q++]**

In one study, ward staff reported that the physical structure of the inpatient setting was found to promote a power play between patients and staff **[Lawn 2004, Australia, Q++]**.

> "*If they didn't smoke, they wouldn't come back to the door every half-an-hour either. There's something about having a closed door between us that makes a difference. It's a real power thing… Staff seems to adopt a certain mentality of control just because of the environment. It's very easy to give people cigarette. It's easier than not giving them."* **[Lawn 2004, Australia, Q++]**

In three studies, nursing and ward staff reported the use of cigarettes as a 'therapeutic' means to help a smooth running of the inpatient ward environment, by, they believe, reducing aggression **[Lawn 2004, Australia, Q++; Lawn 2006; Australia, Q++; Stubbs 2004, England, S+]**.

> "*From both a nurses and client management perspective, if you can keep the ward running smoothly and minimising the amount of aggression, by allowing them to smoke, then allowing them to smoke facilitates that. By all means, I'd rather have a smoother running ward than go home with a broken arm.*" **[Lawn 2004, Australia, Q++]**

> "*I accept that [smoking] affects their health in a derogatory way; however, I think the greater priority is the immediate client and staff safety. And if withholding cigarettes is going to increase client irritability and the potential for aggression and violence, I think the long-term decline in their health is the lesser of the two evils, because of the potential that the immediate violence can cause."* **[Lawn 2006, Australia, Q++]**

EVIDENCE STATEMENTS

ES 4.1 There is strong evidence to suggest that clinical and non-clinical staff mental health staff in inpatient and outpatient settings believe tobacco use is a personal choice of the patient **[Ashton 2010, Australia, S+; Dickens 2004, England, S+; Essenmacher 2008, USA, MM+; Lawn 2004, Australia, Q++; Lawn 2006, Australia, Q++; Williams 2009, USA, S+]**. There is moderate evidence to suggest ward staff in inpatient and outpatient settings perceived that patients experience enjoyment from smoking and use cigarettes as a coping mechanism, and as a means of self-medication to control mental illness symptoms **[Ratschen 2009b, England, Q+; Lawn 2006, Australia, Q++]**. There is moderate evidence to suggest that ward staff and mental health administrators in inpatient and outpatient settings perceive cigarettes to fulfill an especially important function in the lives of patients with mental illness **[Morris 2009, USA +; Ratschen 2009a, England, S++]**.

ES 4.2 There is strong evidence from Australia and the USA to suggest nursing and mental health ward staff, and mental health administrators perceive cigarettes are used as a form of currency or means of control to achieve compliance in inpatients with mental health conditions **[Lawn 2004, Australia, Q++; Lawn 2006, Australia, Q++; Morris 2009, USA, Q+]**; and there is strong evidence to suggest nursing and ward staff and unit administrators perceive cigarettes are used to develop a rapport with inpatients **[Lawn 2004, Australia, Q++; Wye 2010, Australia, S++]**.

ES 4.3 There is strong evidence from Australia and England to suggest nursing and mental health ward staff from predominately inpatient settings believe allowing patients to continue to smoke in hospital, as opposed to withdrawing the provision through banning smoking, will reduce the likelihood of aggression and violence, thereby ensuring a smoother running of an inpatient setting **[Lawn 2004, Australia, Q++; Lawn 2006; Australia, Q++; Stubbs 2004, England, S+]**.

Applicability: Most of the evidence has direct applicability to the current UK settings and/or practices. Four studies were conducted in the UK **[Dickens 2004, England, S+; Ratschen 2009a, England, S++; Ratschen 2009b, England, Q+; Stubbs 2004, England, S+]**, and a further four studies were conducted in countries which were deemed to have similar applicability to that of the UK setting **[Lawn 2006, Australia, Q++; Ashton 2010, Australia, S+; Lawn 2004, Australia, Q++; Wye 2010, Australia, S++]**.

2. Staff attitudes towards smoking cessation in patients

Twenty-four studies and one discussion piece discussed staff attitudes to smoking. The theme is sub-divided into a) negative beliefs regarding quitting, b) positive beliefs regarding quitting, c) influence of staff smoking status on patients, d) roles and responsibilities of staff in quitting, and e) perceived impact of quitting on mental illness.

A. Negative beliefs regarding quitting

There is a popular misconception that patients with mental health conditions are unable to quit smoking **[Ratschen 2010a, Discussion piece]**. This barrier was discussed in eight studies from the point of view of the psychiatrists and nursing staff members and mental health managers **[Edmonds 2007, England, Q++; Lawn 2004, Australia, Q++; Morris 2009, USA, Q+; Price 2007a, USA, S-; Price 2007b, USA, S+; Sharp 2009, USA, S+; Stubbs 2004, England, S+; Wye 2010, Australia, S++]**.

In particular, several studies reported that clinical and non-clinical staff members and mental health managers believed that patients with mental illnesses are unable to stop smoking **[Edmonds 2007, England, Q++; Essenmacher 2008, USA, MM+; Sharp 2009, USA, S+]**, usually did not wish to quit **[Price 2007b, USA, S+; Sidani 2011, USA, S+; Wye 2010, Australia, S++]**, would be non-responsive to their suggestions regarding quitting smoking **[Price 2007b, USA, S+; Sidani 2011, USA, S+]**, or addressing nicotine dependence was "too much to take onboard" and was futile to undertake **[Ratschen 2009b, England, Q+]**.

> *"Many have the attitude that people with mental health problems 'can't stop smoking', 'can't give up', will 'never be able to stop.'"* **[Edmonds 2007, England, Q++]**

In one study, psychiatrists reported previous failures in persuading patients to quit was a barrier to talking about smoking cessation to their patients **[Price 2007b, USA, S+]**.

In three studies, ward staff, psychiatrists and general practitioners, and mental health administrators reported they sometimes actively discouraged patients from quitting smoking **[Morris 2009, USA, Q+; Lubman 2006, Australia, S-; Ratschen 2009b, England, Q+]**. Psychiatrists, general practitioners, and mental health administrators described having advised patients against quitting smoking due to the perception that the patient had too many other issues in their lives already and smoking cessation would be another one, that it was '*not worth the effort*' **[Morris 2009, USA, Q+]**, or that reducing smoking consumption would not be helpful in adolescents with psychosis or depression **[Lubman 2006, Australia, S-]**.

> "*They're poorly and they're going through enough as it is. For them to have to stop smoking as well is even more traumatic. I always say…[] you need to get yourself right before you can stop smoking."* **[Ratschen 2009b, England, Q+]**

B. Positive Beliefs Regarding quitting

Despite the reported negative beliefs regarding the ability for patients with mental health conditions to quit smoking, the results from 10 studies indicated that clinical and non-clinical mental health staff thought it was important for smoking cessation to be addressed in their patients **[Ashton 2010, Australia, S+; O'Donovan 2009, Republic of Ireland, S+; Price 2007a, USA, S-; Ratschen 2009b, England, Q+; Sharp 2009, USA, S+; Sidani 2011, USA, S+; Stubbs 2004, England, S+; Tong 2010, USA, S+; Weinberger 2008, USA, S-; Wye 2010, Australia, S++]**.

> "*Tobacco use leads to long term poor health and financial problems"* and "*Clients are in crisis and are often long term smokers, I think it is difficult but important."* **[Ashton 2010, Australia, S+]**

In two studies, mental health workers, nurses and unit managers also indicated that they felt that it was important for the patient to have the option to stop smoking if they wanted to **[Ashton 2010, Australia, S+; Wye 2010, Australia, S++]**.

> "*I believe people should have a choice if they want to smoke or not."*, "*Important if client wishes to make changes."* **[Ashton 2010, Australia, S+]**

C. Influence of staff smoking status on patients

In six studies, some nurses and ward staff and non-clinical staff stated that their own smoking status was responsible for their negative views regarding encouraging smoking cessation and reduction in patients with mental illness **[Dickens 2004, England, S+; Edmonds 2007, England, Q++; Essenmacher 2008, USA, MM+; Lawn 2004, Australia, Q++; Prochaska 2005, USA, S+; Sarna 2009, USA, S-]**.

> "*To tell you honestly, it's probably my own nicotine addiction that influences how I view my patients' needs. When I'm stressed about something, I usually have a cigarette and pace.*" **[Lawn 2004, Australia, Q++]**

In one study, mental health administrators identified that the overt use of tobacco by other staff members was a barrier for their patients to stop smoking in an inpatient setting as it undermined their role **[Morris 2009, USA, Q+]**.

> "*I'm busy talking to my folks about better health maintenance overall, including smoking cessation and weight loss and exercise, and they're out there smoking with their case manager."* **[Morris 2009, USA, Q+]**

In one study, inpatient clinical and non-clinical staff thought their mental health hospital should provide support for staff members to assist them with trying to quit smoking through taking a multidisciplinary approach to the support offered **[Essenmacher 2008, USA, MM+]**.

D. Roles and responsibilities of staff in quitting

In three studies, psychiatrists and clinical and non-clinical mental health workers expressed the opinion that it was not their responsibility or their area of expertise to provide smoking cessation support **[Ashton 2010, Australia, S+; Essenmacher 2008, USA, MM+; Price 2007b, USA, S+]**; additionally in one UK survey of over 400 clinical mental health professionals, a minority of staff agreed it was their responsibility as a mental health professional to address smoking in their patients **[Ratschen 2009a, England, S++]**.

> *"My patients are not interested; I do not think I am the smoking police."* **[Ashton 2010, Australia, S+]**

In contrast, psychiatrists and practice nurses in one study reported that they felt it was their role to help patients to stop smoking, including increasing their motivation to quit **[Williams 2009, USA, S+]**.

In two studies, community based psychiatrists thought patients' had a preoccupation with other health or medical complaints and therefore didn't talk to their patients about smoking cessation **[Price 2007a, USA, S-; Price 2007b, USA, S+]**.

E. Perceived impact of quitting on mental health

A discussion piece reported it can be difficult to distinguish between withdrawal symptoms and the symptoms of mental illness as the symptoms can overlap considerably, therefore staff may misinterpret nicotine withdrawal as deterioration in mental health **[Campion 2008, Discussion Piece]**. It was noted that ward staff incorrectly attributed nicotine withdrawal as a sign of impending illness deterioration in one study **[Lawn 2004, Australia, Q++]**.

In five studies, clinical and non-clinical mental health staff believed that quitting smoking would have a detrimental effect on the patients' mental health **[Dickens 2004, England, S+; Lawn 2004, Australia, Q++; Scherer unpublished, Brazil, MM+; Sidani 2011, USA, S+; Stubbs 2004, England, S+]**, particularly relating to increased risk of agitation and aggression **[Scherer unpublished, Brazil, MM+]**. However, in a further study mental health clinicians were uncertain whether quitting would result in an exacerbation of psychiatric symptoms **[Weinberger 2008, USA, S-]**. One study reported that during a smoking cessation program study no exacerbations of psychiatric symptoms were noted in patients who had periods of extended abstinence **[Ziedonis 1997, USA, PE-]**.

One study reported that mental health professionals perceived the stress of nicotine withdrawal would significantly impair the effectiveness of medical therapy for mental illnesses **[Landow 1995, USA, S-]**.

EVIDENCE STATEMENTS

ES 5.1 There is strong evidence to suggest that psychiatrists and nursing staff members and mental health managers from inpatient and outpatient settings have the misconception that patients with mental health conditions are unable to stop smoking **[Edmonds 2007, England, Q++; Lawn 2004, Australia, Q++; Morris 2009, USA, Q+; Price 2007a, USA, S-; Price 2007b, USA, S+; Sharp 2009, USA, S+; Stubbs 2004, England, S+; Wye 2010, Australia, S++]**.

ES 5.2 Despite the evidence that staff believe patients with mental health conditions are unable to stop smoking, there is strong evidence to suggest that clinical and non-clinical mental health staff from inpatient and outpatient settings feel that patients' smoking should be addressed **[Ashton 2010, Australia, S+; O'Donovan 2009, Republic of Ireland, S+; Price 2007a, USA, S-; Sharp 2009, USA, S+; Sidani 2011, USA, S+; Tong 2010, USA, S+; Weinberger 2008, USA, S-]**, and moderate evidence that they should have the option to stop smoking if they so wished **[Ashton 2010, Australia, S+]**. Furthermore, there is moderate evidence to suggest that some ward staff, psychiatrists and general practitioners, and mental health administrators from inpatient and outpatient settings actively discourage patients from quitting **[Lubman 2006, Australia, S-; Morris 2009, USA, Q+; Ratschen 2009b, England, Q+]**.

ES 5.3 There is strong evidence to suggest that the smoking status of nurses, ward staff and non-clinical staff predominately from inpatient settings is a barrier to providing and supporting smoking cessation, where smokers are more likely to have negative views about smoking cessation and reduction **[Dickens 2004, England, +; Edmonds 2007, England, Q++; Essenmacher 2008, USA, MM+; Lawn 2004, Australia, Q++; Prochaska 2005, USA, S+; Sarna 2009, USA, S-]**. Additionally, there is weak evidence to suggest mental health administrators from outpatient settings perceive the overt use of tobacco by staff members was a barrier to patients' quitting smoking **[Morris 2009, USA, Q+]**. Furthermore, there was weak evidence to suggest clinical and non-clinical staff perceived that smoking cessation support for staff members should be provided in inpatient settings **[Essenmacher 2008, USA, MM+]**.

ES 5.4 The evidence is mixed regarding the beliefs of whether staff thought providing smoking cessation was part of their role, with strong evidence from four studies to suggest that the majority of psychiatrists and clinical and non-clinical mental health workers from inpatient and outpatient settings did not feel that providing smoking cessation support was part of their role **[Ashton 2010, Australia, S+; Essenmacher 2008, USA, MM+; Price 2007b, USA, S+; Ratschen 2009a, England, S++]**. However, there is weak evidence from one study of psychiatrists and practice nurses from inpatient and outpatient settings to suggest it should be part of their role **[Williams 2009, USA, S+]**. There is weak evidence to suggest community based psychiatrists perceived patients had a preoccupation with other health or medical complaint, and thus smoking cessation would not be a priority for patients **[Price 2007a, USA, S-; Price 2007b, USA, S+]**.

ES 5.5 There is moderate evidence to suggest that clinical and non-clinical mental health staff from inpatient settings perceive quitting smoking would have a detrimental effect on the mental health symptoms of the patient **[Dickens 2004, England, S+; Lawn 2004, Australia, Q++; Scherer unpublished, Brazil, MM+; Sidani 2011, USA, S+; Stubbs 2004, England, S+]**.

ES 5.6 There is very weak evidence from the USA to suggest that mental health professionals perceive the impact of smoking cessation on the effectiveness of medical therapy for mental illnesses is a barrier to implementing smoking cessation support in patients (setting unclear) **[Landow 1995, USA, S-]**.

Applicability: Most of the evidence has direct applicability to the current UK settings and/or practices. Five studies were conducted in the UK **[Dickens 2004, England, S+; Edmonds 2007, England, Q++; Ratschen 2009a, England, S++; Ratschen 2009b, England, Q+; Stubbs 2004, England, S+]**, and a further five studies were conducted in countries which were deemed to have similar applicability to that of the UK setting **[Ashton 2010, Australia, S+; O'Donovan 2009, Republic of Ireland, S+; Lawn 2004, Australia, Q++; Lubman 2006, Australia, S-; Wye 2010, Australia, S++]**.

3. Perceived barriers and facilitators to quitting in patients

Eight studies reported the staff views on the perceived barriers and facilitators the patients had regarding smoking cessation. The identified barriers and facilitators related to motivation, nicotine dependence, psychosocial, and environmental factors.

A. Motivation, nicotine dependence, psychosocial, and environmental factors

In one study, mental health workers explicitly reported they believed boredom was a barrier to quitting and reducing cigarette consumption **[Ashton 2010, Australia, S+]**, and they thought *"Mental health clients [were] already highly stressed and vulnerable"* and smoking cessation would increase this **[Ashton 2010, Australia, S+]**.

Furthermore, two studies reported that mental health administrators and psychiatric nurses perceived patients' motivation to quit smoking was low **[Morris 2009, USA, Q+; Sharp 2009, USA, S+]**, and in one further study, mental health clinicians strongly agreed that a patient's motivation was the most important factor for a successful quit attempt **[Weinberger 2008, USA, S-]**.

In one study, mental health workers reported strong tobacco dependence was a major barrier for patients **[Ashton 2010, Australia, S+]**.

In one study, mental health workers reported they thought social isolation was a barrier to quitting and reducing cigarette consumption **[Ashton 2010, Australia, S+]**. Additionally, in a further study, a common perspective held by mental health administrators was that patients who successfully quit smoking would lose their peer group **[Morris 2009, USA, Q+]**.

> "*If they [mental health patient] stop and their friends are still smoking, who do they hang out with?"* **[Morris 2009, USA, Q+]**

In two studies, ward staff in inpatient settings perceived that a lack of meaningful activities was as a barrier to patients' stopping smoking **[Lawn 2004, Australia, Q++; Ratschen 2009b, England, Q+]**.

> "*In the locked ward I don't think there's much in the way of one-to-one therapeutic activity that happens. It's kind of, 'Let's wait for the medication to work'. There's just nothing to do. The only normal thing to do at the time is to smoke*" **[Lawn 2004, Australia, Q++]**.

In one study, clinical and non-clinical staff thought the psychiatric hospital they worked in should offer alternative therapies including tai chi and yoga as a facilitator for smoking cessation **[Essenmacher 2008, USA, MM+]**.

One study assessed the implementation of a tailored tobacco dependence service in mental health settings in the UK, and assessed its impact, and barriers and facilitators to implementation **[Parker 2012, England, MM+]**. This study found that the mental health professional advisors recruited to support patients and staff with tobacco dependence identified factors relating to motivation and

attention can pose barriers to engaging with and retaining particularly inpatients in a tobacco dependence service.

EVIDENCE STATEMENTS

ES 6.1 There is moderate evidence to suggest mental health staff and administrators from inpatient and outpatient settings perceived boredom, increased stress, tobacco dependence, and a lack of motivation as barriers to quitting smoking in patients with mental illness **[Ashton 2010, Australia, S+; Morris 2009, USA, Q+; Sharp 2009, USA, S+]**.

ES 6.2 There is moderate evidence to suggest ward staff from an inpatient setting thought a lack of activities was a barrier for patients' quitting smoking **[Lawn 2004, Australia, Q++; Ratschen 2009b, England, Q+]**, and there was weak evidence to suggest that clinical and non-clinical staff from an inpatient setting perceived that introducing meaningful activities would act as a facilitator for smoking cessation **[Essenmacher 2008, USA, MM+]**.

ES 6.3 There is moderate evidence to suggest mental health staff and administrators from inpatient and outpatient settings thought social isolation was a barrier for patient's quitting smoking **[Ashton 2010, Australia, S+; Morris 2009, USA, Q+]**.

ES 6.4 There is recent evidence to suggest that factors related to motivation and attention can pose barriers to engaging with and retaining particularly inpatients in a tobacco dependence service **[Parker 2012, England, MM+]**.

Applicability: The majority of the evidence has direct applicability to the current UK settings and/or practices. Two studies were conducted in the UK **[Parker 2012, England, MM+; Ratschen 2009b, England, Q+]**, and a further two studies were conducted in a country which was deemed to have similar applicability to that of the UK setting **[Ashton 2010, Australia, S+; Lawn 2004, Australia, Q++]**.

4. Staff skills and knowledge

Eighteen studies and one discussion piece discussed staff skills and abilities to provide smoking cessation support. The theme is sub-divided into a) confidence in providing smoking cessation support, and b) adequacy of training.

A. Confidence in providing smoking cessation support

In six studies, psychiatrists, ward staff, psychiatric nurses and mental health counsellors often expressed the opinion that they lacked the confidence to provide smoking cessation support or recommend pharmacotherapy to patients with mental health conditions **[Price 2007a, USA, S-; Price 2007b, USA, S+; Prochaska 2005, USA, S+; Ratschen 2009a, England, S++; Sharp 2009, USA, S+; Sidani 2011, USA, S+]**. In particular, psychiatric nurses didn't feel confident regarding their ability to help their patients quit even though they felt knowledgeable regarding stop smoking medications and had relatively high levels of knowledge regarding counselling strategies **[Sharp 2009, USA, S+]**. In contrast, the majority of clinical and non-clinical staff in another study in an inpatient setting felt between moderately and extremely confident in providing smoking cessation **[Essenmacher 2008, USA, MM+]**. There was some evidence that clinical and non-clinical staff that had ever smoked were less likely to feel confident in providing smoking cessation support, for example, **[Essenmacher 2008, USA, MM+]**.

In one study, 6 months of training in one-to-one services resulted in mental health professionals feeling more confident to raise awareness and discuss smoking and stop smoking services with clients and their colleagues, and feel more confident in recommending which smoking cessation pharmacotherapy should be used **[Edmonds 2007, England, Q++]**.

B. Adequacy of training

As a Barrier: A common barrier to implementing smoking cessation advice or support was the lack of training in smoking cessation. In 13 studies clinical and non-clinical staff expressed their lack of preparedness for addressing smoking cessation in their clients was due to a lack of training or education **[Essenmacher 2008, USA, MM+; O'Donovan 2009, Republic of Ireland, S+; Price 2007a, USA, S-; Price 2007b, USA, S+; Prochaska 2005, USA, S+; Prochaska 2006, USA, S+; Secker-Walker 1994, USA, S+; Sharp 2009, USA, S+; Sidani 2011, USA, S+; Tong 2010, USA, S+; Williams 2009, USA, S+; Zvolensky 2005, USA, S-]**.

In a UK survey, approximately half of 459 clinical mental health professionals reported having attended training related to smoking **[Ratschen 2009a, England, S++]**. Respondents from the survey generally believed smoking prevalence was higher among patients with mental illness compared to the general population; however, approximately a fifth of respondents incorrectly believed smoking prevalence was lower. Additionally, more than a third of respondents incorrectly believed nicotine and carbon monoxide caused cancer **[Ratschen 2009a, England, S++]**. In particular, psychiatrists, mental health staff and nurses reported insufficient time was allocated to smoking cessation and tobacco dependence in their undergraduate curriculum **[Sharp 2009, USA, S+; Prochaska 2005, USA, S+; Williams 2009, USA, S+]**, during residency, continuing medical education or during their job **[Prochaska 2005, USA, S+]**. Furthermore, a lack of training regarding smoking cessation medications was one of the main barriers for not prescribing NRT in a study of community based psychiatrists for

adolescent and child patients with mental health conditions **[Price 2007b, USA, S+]**. Additionally, fewer than half of the respondents from a survey of 123 managers of psychiatric inpatients units reported that their unit provides any type of staff training in smoking assessment or smoking care **[Wye 2009, Australia, S++]**.

As a Facilitator: A common facilitator to implementing smoking cessation advice or support was providing staff with training for smoking cessation, and potentially making this mandatory at all levels to ensure a greater awareness **[Ratschen 2010a, Discussion piece]**. A literature review of primary studies reported, "*In order for cessation programmes to develop and be successful, staff need to be education about evidence-based tobacco dependence treatment practices. Education can also help to improve attitudes about the hope for successful treatment and encourage providers to offer alternatives to smoking"* **[Williams 2011, Review, -]**.

Four studies found that mental health professionals and administrators identified that more training in smoking cessation education would be helpful **[Edmonds 2007, England, Q++; Morris 2009, USA, Q+; O'Donovan 2009, Republic of Ireland, S+; Ratschen 2009b, England, Q+]**, in particular relating to information regarding withdrawal symptoms and the potential effect on some medications from reducing or quitting smoking.

In particular, staff education was identified as a crucial component by mental health administrator staff, with staff preferring to have the training located onsite using user-friendly, manualised tools. The study questioned staff regarding the content of the education, and staff thought it should contain information about the existing evidence base and clinical guidance for how best to approach mental health patients, the harms of smoking versus the potential benefits of symptom control **[Morris 2009, USA, Q+]**.

Furthermore, a study of 114 respondents from residency training programmes reported that several programmes didn't contain smoking cessation training because it was perceived that the focus of the training should address the management of a patient's psychiatric symptoms. However, half of the programmes addressed treatment of nicotine dependence in their curriculum with some additionally providing relevant clinical experiences, such as leading smoking cessation groups, with psychiatric or substance abusing populations. Additionally, the majority of the faculty who provided the training in tobacco treatment held expertise in both smoking cessation and working with patients with mental health conditions **[Prochaska 2006, USA, S+]**.

In one study, mental health administrator staff reported that they perceived the content of a successful smoking cessation training package would include positive expectations of success in quitting from both staff and patients **[Morris 2009, USA, Q+]**.

> *"[Smoking is] something that you just keep coming back to. You talk about it every single time you see the consumer."* **[Morris 2009, USA, Q+]**

In a UK survey of over 400 clinical mental health professionals, respondents who had attended training were significantly more likely to correctly know that higher doses of certain antipsychotic medications are needed in patients who smoke **[Ratschen 2009a, England, S++]**.

EVIDENCE STATEMENTS

ES 7.1 There was strong evidence to suggest that psychiatrists, ward staff, psychiatric nurses and mental health counsellors from inpatient and outpatient settings felt a lack of confidence in providing smoking cessation support to patients with mental health conditions **[Price 2007a, USA, S-; Price 2007b, USA, S+; Prochaska 2005, USA, S+; Ratschen 2009a, England, S++; Sharp 2009, USA, S+; Sidani 2011, USA, S+]**, even though some staff felt knowledgeable regarding the harms of smoking and stop smoking strategies. There was moderate evidence to suggest education in one-to-one services resulted in mental health professionals from a community setting feeling more confident to provide smoking cessation support to patients with mental health conditions **[Edmonds 2007, England, Q++].**

ES 7.2 There was strong evidence to suggest that a lack of training during their education and whilst in post was directly responsible for the lack of preparedness that clinical and non-clinical staff from inpatient and outpatient settings felt towards implementing smoking cessation strategies **[Essenmacher 2008, USA, MM+; O'Donovan 2009, Republic of Ireland, S+; Price 2007a, USA, S-; Price 2007b, USA, S+; Prochaska 2005, USA, S+; Secker-Walker 1994, USA, S+; Sharp 2009, USA, S+; Sidani 2011, USA, S+; Tong 2010, USA, S+; Williams 2009, USA, S+; Zvolensky 2005, USA, S-]**.

ES 7.3 There was moderate evidence from one large UK survey to suggest clinical mental health professionals from an inpatient setting had a lack of knowledge regarding the prevalence of smoking and tobacco addiction in patients with mental illness, and half of the respondents lacked any formal training in smoking cessation **[Ratschen 2009a, England, S++]**.

ES 7.4 There was strong evidence to suggest that mental health professionals and administrators from inpatient and outpatient settings described that more training in smoking cessation would be helpful **[Edmonds 2007, England, Q++; Morris 2009, USA, Q+; O'Donovan 2009, Republic of Ireland, S+]**, in particular it was suggested that the training should be located onsite using user-friendly, manualised tools and should contain information regarding how best to approach mental health patients, the harms of smoking versus the potential benefits of symptom control **[Morris 2009, USA, Q+]**, and the impact smoking reduction and cessation can have on some medications **[Ratschen 2009b, England, Q+]**. There was moderate evidence to suggest including the treatment of nicotine dependence, with relevant clinical experiences (such as leading smoking cessation groups) in the curriculum of residency programmes would facilitate providing smoking cessation support for patients with mental health conditions **[Prochaska 2006, USA, S+]**. Additionally, there was weak evidence to suggest that mental health administrator staff perceived a positive expectation of success at quitting would be an essential component of a successful smoking cessation training package **[Morris 2009, USA, Q+]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Three studies were conducted in the UK **[Edmonds 2007, England, Q++; Ratschen 2009a, England, S++; Ratschen 2009b, England, Q+]**, and a further two studies were conducted in countries which were deemed to have similar applicability to that of the UK setting **[O'Donovan 2009, Republic of Ireland, S+; Wye 2010, Australia, S++]**.

5. Staff perceptions of systems and policies

Fourteen studies discussed the impact that systems and policies have on providing smoking cessation support to patients with mental health conditions. This theme is sub-divided into a) priority of smoking cessation, and b) time and other resources.

A. Priority of smoking cessation

In six studies, clinical and non-clinical mental health professionals and administrators expressed a major barrier to offering stop smoking support was that it was not a priority in their service or their workload **[Edmonds 2007, England, Q++; Morris 2009, USA, Q+; Price 2007b, USA, S+; Prochaska 2006, USA, S+; Sharp 2009, USA, S+; Williams 2009, USA, S+]**. However, in a survey of 123 unit managers the majority of them reported smoking cessation was as important as other roles within their unit, and should be an integral function of their unit **[Wye 2010, Australia, S++]**.

In a further study, three quarters of respondents from a survey of service managers reported the commitment of their local mental health trust as 'none' or 'not enough'. Targets for treating people with mental illnesses for smoking cessation were only set by a minority of services (11%) **[McNally 2010, England, MM+]**.

B. Time and other resources

In nine studies, clinical and non-clinical mental health professionals reported insufficient time as a barrier to providing smoking cessation to patients **[Ashton 2010, Australia, S+; Edmonds 2007, England, Q++; Essenmacher 2008, USA, MM+; O'Donovan 2009, Republic of Ireland, S+; Price 2007a, USA, S-; Price 2007b, USA, S+; Sidani 2011, USA, S+; Williams 2009, USA, S+]**; with only approximately half of staff in a survey in the UK reported that they could make time to deal with patients' nicotine dependence within their working routine **[Ratschen 2009a, England, S++]**.

"*Time restraints often mean other issues increase in priorities*" **[Ashton 2010, Australia, S+]**

EVIDENCE STATEMENTS

ES 8.1 There is strong evidence to suggest clinical and non-clinical mental health professionals and administrators predominately from outpatient settings perceive the lack of prioritising smoking cessation support either in the mental health service or as part of the staff's workload was a major barrier to offering stop smoking support **[Edmonds 2007, England, Q++; Morris 2009, USA, Q+; Price 2007b, USA, S+; Prochaska 2006, USA, S+; Sharp 2009, USA, S+; Williams 2009, USA, S+]**.

ES 8.2 There is weak evidence to suggest that service managers from outpatient settings perceived the lack of setting targets for treating patients with mental health conditions within services in the UK is a barrier to delivering stop smoking support to these patients **[McNally 2010, England, MM+]**.

ES 8.3 There is strong evidence to suggest that clinical and non-clinical mental health professionals from inpatient and outpatient settings perceive that they are not able to dedicate sufficient time to provide smoking cessation support during their role due to conflicting priorities **[Ashton 2010, Australia, S+; Edmonds 2007, England, Q++; Essenmacher 2008, USA, MM+; O'Donovan 2009, Republic of Ireland, S+; Price 2007a, USA, S-; Price 2007b, USA, S+; Ratschen 2009a, England, S++; Sidani 2011, USA, S+; Williams 2009, USA, S+]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Three studies were conducted in the UK **[Edmonds 2007, England, Q++; McNally 2010, England, MM+; Ratschen 2009a, England, S++]**, and a further two studies were conducted in countries which were deemed to have similar applicability to that of the UK setting **[Ashton 2010, Australia, S+; O'Donovan 2009, Republic of Ireland, S+]**.

6. Staff perceptions regarding interventions for smoking cessation in patients

Fourteen studies, one review and a discussion piece discussed the barriers and facilitators relating to staff perceptions regarding interventions for smoking cessation. This theme was sub-divided into a) perceived effectiveness and safety of interventions, b) accessibility and awareness of interventions and services offered, c) lack of re-imbursement, and d) suggested support for patients.

A. Perceived effectiveness and safety of interventions

Three studies of mental health service staff and psychiatrists perceived a lack of effectiveness, safety and compliance issues with the use of NRT in mental health populations for smoking cessation **[Morris 2009, USA, Q+; Price 2007b, USA, S++; Scherer unpublished, Brazil MM+; Sidani 2011, USA, S++]**.

> "*I know the nicotine patch and I know that it doesn't work.*" **[Scherer unpublished, Brazil, MM+]**.

In one study, mental health service staff thought there was not sufficient evidence to show that cessation strategies, such as counselling and NRT, were effective **[Morris 2009, USA, Q+]**.

> "*The problem is that there isn't actually evidence that it [cessation strategies] works.*" **[Morris 2009, USA, Q+]**

In a survey of clinical mental health counsellors, only a third thought it was likely that recommending pharmacotherapy to clients who smoked would help more clients to quit **[Sidani 2011, USA, S+]**.

However, in one study, the majority of physicians believe that face-to-face counselling (75%), NRT patch (84%), and bupropion (82%) were effective medications for smoking cessation in the general population; however, their effectiveness in patients with mental illness was not assessed **[Tong 2010, USA, S+]**.

One study of community based adolescent and child psychiatrists reported that they did not prescribe NRT for smoking cessation to their clients because they thought NRT had not been adequately tested with adolescents (13.6%), or were worried that it was not safe in adolescents **[Price 2007b, USA, S+]**.

In two studies of community based psychiatrists, one of the main barriers reported for not prescribing NRT in their service was that smokers would not comply with NRT **[Price 2007a, USA, S-; Price 2007b, USA, S+]**.

In a UK survey of over 400 clinical mental health professionals, there was a common belief that NRT interfered with antipsychotic medications; this was a view held particularly by staff who smoked. Additionally, many of the non-mental staff respondents thought, incorrectly, that addiction to NRT was common **[Ratschen 2009a, England, S++]**.

Finally, a pilot project from the UK assessed the implementation of a tailored tobacco dependence service in mental health settings, and assessed its impact, and barriers and facilitators to implementation **[Parker 2012, England, MM+]**.It was found that the mental health professional advisors recruited to support patients and staff with tobacco dependence identified that staff had concerns regarding the 'harmful effect' and expense to the Trust of NRT.

B. Awareness of staff of services

In two primary studies and one review, staff discussed the impact of the staff's lack of awareness of services for smoking cessation **[Williams 2011, Review, -; Price 2007a, USA, S-; Weinberger 2008, USA, S-]**.

A literature review of primary evidence studies reported that "*Referral to a community of state-funded tobacco treatment may also not be likely given that psychiatrists lack awareness about these programmes more often than other medical colleagues"* **[Williams 2011, Review, -]**. A survey of community based psychiatrists found that 18% of respondents did not support their patients to quit smoking because they did not know where to send their patients for treatment **[Price 2007a, USA, S-]**; however, in another study the majority of mental health clinicians knew where to refer patients who wanted to stop smoking **[Weinberger 2008, USA, S-]**.

C. Lack of Re-imbursement

In four US studies, the lack of resources and re-imbursement for interventions from the state were identified as barriers to treating smoking cessation in mental health populations by mental health administrators and clinical mental health professionals **[Morris 2009, USA, Q+; Price 2007b, USA, S+; Sidani 2011, USA, S+; Tong 2010, USA, S+]**. Additionally, two US studies of community based psychiatrists highlighted common barriers for prescribing NRT to patients who smoked were the lack of insurance coverage (including Medicaid) and that their patients couldn't afford the cost of NRT **[Price 2007a, USA, S-; Price 2007b, USA, S+]**.

Additionally, in a discussion piece, the authors suggest a way forward would be to introduce strong financial incentives for clinicians to encourage them to address smoking in their patients with mental health conditions, possibly linking this through the quality of outcome framework in primary care and within a suitable programme for secondary mental health care clinicians **[Ratschen 2010a, Discussion piece]**.

D. Information and accessibility of support for patients

In two studies, nurses and mental health professionals perceived that patients had a lack of information and support for smoking cessation and that this was a major barrier for quitting and reducing cigarette consumption **[Ashton 2010, Australia, S+; Dickens 2004, England, S+]**.

> "*[Patients] should be educated to give them an informed choice."* **[Dickens 2004, England, S+]**

In two studies, mental health workers and ward staff thought providing patients with information and support would address this barrier **[Ashton 2010, Australia, S+; Ratschen 2009b, England, Q+]**.

In one study, clinical and non-clinical staff thought their psychiatric hospital should promote quitting in patients with mental health conditions through taking a multidisciplinary approach to the support offered **[Essenmacher 2008, USA, MM+]**.

A literature review highlighted that "*Practical matters like not having a telephone or internet access could also be barriers to using telephone or internet-based services effectively"* **[Williams 2011, Review, -]**.

E. Other factors influencing the provision of smoking cessation interventions

One study of 123 unit mangers from psychiatric units in Australia found the following factors were perceived to influence whether a patient received treatment for nicotine dependence: whether the patient requested assistance to quit, whether the patient was receptive to receiving interventions for smoking cessation, whether an improvement in the patient's health would be seen with quitting , whether the interventions were perceived to be effective, and the availability of NRT on the psychiatric unit **[Wye 2010, Australia, S++]**. In a further study conducted in the UK, the majority of staff reported that NRT products and behavioural support for smoking cessation and reduction were readily available in their inpatients mental health setting (64%) **[Ratschen 2009a, England, S++]**.

Evidence statements

ES 9.1 There is strong evidence from the USA and Brazil to suggest that mental health service staff and psychiatrists from inpatient and outpatient settings perceived NRT was not effective in mental health populations for smoking cessation **[Morris 2009, USA, Q+; Price 2007b, USA, S+; Scherer unpublished, Brazil MM+; Sidani 2011, USA, S+]**. There is weak evidence from one USA study to suggest that community based psychiatrists considered the safety of NRT use in adolescents and children with mental health conditions was a major barrier to using NRT for smoking cessation **[Price 2007b, USA, S+]**. There was moderate evidence from England to suggest non-medical inpatient staff were more likely to, incorrectly, believe addiction to NRT was common, compared to medical inpatient staff **[Ratschen 2009a, England, S++]**. Finally, there is weak evidence to suggest that staff had concerns regarding the 'harmful effect' and expense to the Trust of NRT **[Parker 2012, England, MM+]**.

ES 9.2 There is weak evidence from the USA to suggest community based psychiatrists were not prescribing NRT in their service due to their perception that smokers with mental health conditions would not comply with NRT **[Price 2007a, USA, S-; Price 2007b, USA, S+]**, and moderate evidence from England to suggest it is because inpatient mental health staff believed NRT interfered with antipsychotic medications **[Ratschen 2009a, England, S++]**.

ES 9.3 There is mixed weak evidence regarding whether clinical mental health staff's lack of awareness of smoking cessation services was a barrier to providing smoking cessation support in patients with mental health conditions in inpatient and outpatient settings **[Williams 2011, Review, -; Price 2007a, USA, S-; Weinberger 2008, USA, S-]**.

ES 9.4 There is strong evidence from US studies to suggest that clinical mental health staff and administrators predominately from outpatient settings thought a major barrier to providing smoking cessation support in patients with mental health conditions was the lack of resources and re-imbursement for smoking cessation interventions from the state **[Morris 2009, USA, Q+; Price 2007b, USA, S+; Sidani 2011, USA, S+; Tong 2010, USA, S+]**.

ES 9.5 There is moderate evidence to suggest that nurses and mental health professionals predominately from inpatient settings perceive that the patients had a lack of information and support relating to smoking cessation support **[Ashton 2010, Australia, S+; Dickens 2004, England, S+]**, and addressing this would be a facilitator for smoking cessation and reduction **[Ashton 2010, Australia, S+; Ratschen 2009b, England, Q+]**. Additionally, there is very weak evidence to suggest that a major barrier to accessing smoking cessation services was a lack of access to a telephone or internet **[Williams 2011, Review, -]**.

ES 9.6 There is moderate evidence from Australia to suggest that the following factors were the psychiatric unit managers perceptions for whether a patient received treatment for nicotine dependence: i) whether the patient requested assistance to quit, ii) whether the patient was receptive to receiving interventions for smoking cessation, iii) whether an improvement in the patient's health would be seen with quitting , iv) whether the interventions were perceived to be effective, and v) the availability of NRT on the psychiatric unit **[Wye 2010, Australia, S++]**. There is moderate evidence from England to suggest that inpatient mental health staff perceive NRT products and behavioural support for smoking cessation and reduction were readily available in their inpatients mental health setting **[Ratschen 2009a, England, S++]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Three studies were conducted in the UK **[Dickens 2004, England, S+; Parker 2012, England, MM+; Ratschen 2009a, England, S++]**, and two studies were conducted in a country which was deemed to have similar applicability to that of the UK setting **[Ashton 2010, Australia, S+; Wye 2010, Australia, S++]**. However, the evidence relating to the lack of resources and re-imbursement as a barrier for providing smoking cessation interventions is likely not to be applicable to the UK setting and/or practices.

SUBSIDIARY QUESTION: ARE THERE DIFFERENCES IN ACCEPTABILITY OF SMOKING CESSATION AND TEMPORARY ABSTINENCE INTERVENTIONS BY DELIVERER, SETTING, TIMING (OR POINT IN THE CARE PATHWAY), FREQUENCY, DURATION, AND SEVERITY OF DEPENDENCE?

None of the included studies assessed the differences in acceptability of smoking cessation and temporary abstinence interventions by deliverer, timing (or point in care pathway), frequency, duration or severity of dependence. The findings in the previous two sections detailed the differences in acceptability by the setting (inpatient versus outpatient).

EVIDENCE STATEMENTS

ES 10.1 No evidence was identified which assessed the differences in acceptability of smoking cessation and temporary abstinence interventions by deliverer, timing (or point in care pathway), frequency, duration or severity of dependence.

SUBSIDIARY QUESTION: ARE THERE DIFFERENCES IN ACCEPTABILITY OF SMOKING CESSATION AND TEMPORARY ABSTINENCE INTERVENTIONS BY MENTAL HEALTH DIAGNOSIS, GENDER, SEXUAL ORIENTATION, AGE, ETHNICITY, RELIGION, SOCIOECONOMIC STATUS, DISABILITY, AND POPULATION OF INTEREST (INCLUDING PATIENTS, HOUSEHOLD MEMBERS, VISITORS AND STAFF)?

None of the included studies assessed the differences in acceptability of smoking cessation and temporary abstinence interventions by gender, sexual orientation, ethnicity, religion, socioeconomic status or disability. The findings in the previous two sections detailed the differences in acceptability by the population of interest (including patients, relatives and staff). Thus the findings below relate to studies which compared differences by mental health diagnosis, and those that were focused on children and adolescents. The methods and findings of the studies are presented briefly in Table 5. Any interesting differences which focus on the themes and subthemes identified in the previous sections are described below.

MENTAL HEALTH DIAGNOSIS

One of the included studies compared the experiences of community based patients by mental health diagnosis **[Lawn 2002, Australia, Q++]**. The study reported the reasons for why patients smoked cigarettes were described by patients with schizophrenia were primarily relating to preventing illness relapse, with patients reporting strong fears of relapse, and thus the need for a continual supply of cigarettes was vital with patients resorting to begging, stealing or picking up butts. Patients with depression also reported the need for ensuring supply of their cigarettes; however, in contrast to the behaviours exhibited by patients with schizophrenia, patients with depression reported being able to juggle their other needs and commitments to ensure that their supply could last for a few extra days until they had more funds available. Patients with personality disorders appeared to smoke depending on whether they were well or not, with patients reporting

an unconscious need to smoke when they were unwell. Additionally, patients with personality disorders appeared to exhibit quite risky behaviours to get cigarettes when they were unwell, whilst at time of wellbeing they appeared to be able to ignore the need to smoke **[Lawn 2002, Australia, Q++]**.

The study also compared the perceived barriers of making a quit attempt by mental health diagnosis **[Lawn 2002, Australia, Q++]**. Patients with schizophrenia failed to describe concerns regarding the impact that smoking had on their physical health, which was in contrast to patient with depression, who saw continuing to smoke would have serious detrimental effects on their physical health. For patients with personality disorders, the self-enjoyment and self-reward they received from smoking overshadowed any desire they felt to make a quit attempt. For some patients with personality disorders, they reported the pleasurable and at times euphoric effects of smoking after abstaining from cigarettes for a period of time, either due to lack of funds or voluntarily imposed abstinence.

AGE

One of the included studies assessed the views' of psychiatrists for child and adolescent **[Price 2007b, USA, Q+]**; the themes and subthemes relating to this study are presented in the relevant main question sections since similar themes and subthemes were identified from this study as reported in other studies of adults.

EVIDENCE STATEMENTS

ES 11.1 No evidence was identified which assessed the differences in acceptability of smoking cessation and temporary abstinence interventions by gender, sexual orientation, ethnicity, religion, socioeconomic status or disability.

ES 11.2 There is moderate evidence to suggest outpatients with schizophrenia or depression use cigarettes to overcome their fears of mental illness relapse **[Lawn 2002, Australia, Q++]**. Outpatients with schizophrenia exhibit overt behaviours to ensure their cigarette supply continues (for example, stealing cigarettes), whereas outpatients with depression appeared to have better coping strategies to ensure their supply lasted until they have sufficient funds to purchase more. Outpatients with personality disorders have an unconscious need to smoke when they are unwell and were shown to exhibit risky behaviours to ensure their supply continues **[Lawn 2002, Australia, Q++]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. None of the studies were conducted in the UK**;** however, one study was conducted in a country which was deemed to have similar applicability to that of the UK setting **[Lawn 2002, Australia, Q++]**.

Table 5 Characteristics of included studies – Studies which compared views of patients and staff members by mental health diagnosis and age

Author, year, quality	Aim of the study	Method, population, and setting	Location
Author: Lawn **Year**: 2002 **Quality**: ++	To describe the experiences of mental health clinics as they relate to smoking behaviour, the relationship of smoking behaviour to the course of their mental illness and its management, and to their attempts to quit smoking	**Method**: Interviews **Population**: Patients with schizophrenia, depression, bipolar affective disorder, and personality disorder **Sample size**: 24 **Setting**: Community	Australia
Author: Price **Year**: 2007b **Quality**: +	Practice and perceptions of smoking cessation activities among child and adolescent psychiatrists	**Method**: Survey **Population**: Psychiatrists **Sample size**: 184 **Setting**: Community	USA

QUESTION 2. WHICH STRATEGIES/APPROACHES ARE EFFECTIVE IN ENCOURAGING MENTAL HEALTH CARE PROFESSIONALS TO RECORD SMOKING STATUS?

Thirteen of the included studies discussed the strategies or approaches used for recording smoking status of patients with mental illness **[Johnson 2009, Canada, S+; Parker 2012, England, MM+; Price 2007a, USA, S-; Price 2007b, USA, S+; Prochaska 2005, USA, S+; Sarna 2009, USA, S-; Secker-Walker 1994, USA, S+; Sharp 2009, USA, S+; Sidani 2011, USA, S+; Tong 2010, USA, S+; Williams 2009, USA, S+; Wye 2009, Australia, S++; Zvolensky 2005, USA, S-]**. The methods and findings of the studies are presented briefly in Table 6.

In six studies, mental health professionals, including psychiatrists and psychiatric nurses, reported that they regularly ask their patients with mental illness about their smoking status **[Price 2007a, USA, S-; Price 2007b, USA, S+; Sarna 2009, USA, S-; Sharp 2009, USA, S+; Tong 2010, USA, S+; Williams 2009, USA, S+]**, including one study whose respondents were psychiatrists for children and adolescents **[Price 2007b, USA, S+]**. However, approximately half of psychiatry residents asked their inpatients **[Prochaska 2005, USA, S+]**, and only a quarter of respondents reported that they regularly also documented smoking behaviour for the majority of their child and adolescents patients **[Price 2007b, USA, S+]**. Additionally, only approximately half of clinical mental health counsellors reported that they identified and documented the smoking behaviour of all of their clients **[Sidani 2011, USA, S+]**. In two studies, between a quarter and a third of respondents reported never identifying or documenting smoking status **[Sidani 2011, USA, S+; Price 2007a, USA, S-]**, and in one study less than a third of psychiatric nurses reported regularly asking their patients about their smoking behaviour **[Zvolensky 2005, USA, S-]**. Additionally, a survey also found that a minority of personnel monitored or audited medical records to ensure recording of patient smoking status **[Wye 2009, Australia, S++]**.

One study from the UK assessed the implementation of a tailored tobacco dependence service in mental health settings, and assessed its impact, and barriers and facilitators to implementation **[Parker 2012, England, MM+]**. This study initially conducted an audit in inpatient and community settings. The recording of smoking status was a mandatory item for inpatient; however no standard procedure for recording of smoking status was identified in community based patients. The audit identified that 73% of inpatients were recorded as current smokers; however, only 22% of 2038 community patients had an electronic record of their smoking status.

In one study, the factors which predicted whether the smoking status of patients was recorded at admission was having a sympathetic attitude towards the role of the provider, and having a greater confidence in the provision of smoking cessation counselling **[Johnson 2009, Canada, S+]**. However, in a survey of 123 unit managers, respondents commonly reported that it was the decision of the individual staff members which determined whether the patients smoking status was assessed or recorded **[Wye 2009, Australia, S++]**.

In two studies, respondents reported routine systems were used to identify smokers, where the majority of them reported glancing at the patients' charts **[Secker-Walker 1994, USA, S+**; **Zvolensky**

2005, USA, S-]. Additionally, in a survey of community based psychiatrists, only a minority of respondents reported using a formal prompt, such as a sticker or note on the patients' records, to remind them to address nicotine dependence if their patient smoked **[Price 2007a, USA, S-]**.

In one study, staff perceived that systematic methods for identifying smokers should be used which could include chart tracking mechanisms, management information systems and electronic medical records **[Morris 2009, USA, Q+]**.

EVIDENCE STATEMENTS

ES 12.1 There is mixed evidence regarding whether patients are regularly asked about their smoking behaviour, with moderate evidence from the USA to suggest mental health staff from inpatient and outpatient settings regularly ask the smoking status of patients with mental illness **[Price 2007a, USA, S-; Price 2007b, USA, S+; Sarna 2009, USA, S-; Sharp 2009, USA, S+; Tong 2010, USA, S+; Williams 2009, USA, S+]**, but moderate evidence from Australia to suggest it is at the discretion of the mental health staff member in an inpatient setting whether they ask the smoking behaviour of their patients **[Wye 2009, Australia, S++]**. Additionally, there is moderate evidence from the USA to suggest a substantial proportion of mental health staff predominately from outpatient settings never document the smoking status of patients with mental illness **[Price 2007a, USA, S-; Price 2007b, USA, S+; Sidani 2011, USA, S+; Zvolensky 2005, USA, S+]**, but moderate evidence to suggest it is at the discretion of the mental health staff member in an inpatient setting whether they document the smoking behaviour of their patients **[Wye 2009, Australia, S++]**. There is recent evidence from the UK to suggest that whilst measures may be in place for inpatients to record and provide treatment for smoking, this may not be the case for community based patients **[Parker 2012, England, MM+]**.

ES 12.2 There is moderate evidence from the USA to suggest routine systems are used to identify patients who smoked predominately from outpatient settings, including consulting the patients' chart **[Secker-Walker 1994, USA, S+; Zvolensky 2005, USA, S-]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Only one of the studies was conducted in the UK **[Parker 2012, England, MM+]**, and one study was conducted in a country which was deemed to be similar to that of the UK setting **[Wye 2009, Australia, S++]**.

Table 6 Characteristics of included studies – Recording smoking status

Author, year, quality	Aim of the study	Method, population, and setting	Location
Author: Johnson **Year:** 2009 **Quality:** +	To describe mental health care providers' attitudes about tobacco use and confidence in providing effective smoking cessation intervention, personal smoking status, incorporation of smoking cessations interventions into practice	**Method:** Survey **Population:** Mental health care providers **Sample size:** 282 **Setting:** Community	Canada
Author: Parker **Year:** 2012 **Quality:** +	To implement a tailored tobacco dependence service in mental health settings and assess its impact, and barriers and facilitators to implementation	**Method:** Mixed methods **Population:** Mental health professional advisers supporting patients and staff who are smokers **Sample size:** Two advisors reporting on barriers and facilitators relating to 2038 community patients and 4 acute and 2 rehabilitation wards containing a total of 129 beds **Setting:** Inpatient and community	England
Author: Price **Year:** 2007a **Quality:** -	To explore psychiatrists' perceptions and practices relating to treating smoking in patients, and to examine whether these perceptions and practices varied by psychiatrists' characteristics	**Method:** Survey **Population:** Psychiatrists **Sample size:** 78 **Setting:** Community	USA
Author: Price **Year:** 2007b **Quality:** +	Practices and perceptions of smoking cessation activities among child and adolescent psychiatrists	**Method:** Survey **Population:** Child and adolescent psychiatrists **Sample size:** 184 **Setting:** Community	USA
Author: Prochaska **Year**: 2005 **Quality**: +	To assess the need for and interest in tobacco cessation curricula in psychiatric residency training	**Method**: Survey **Population**: Psychiatry residents **Sample size**: 105 **Setting**: Inpatient	USA
Author: Sarna **Year:** 2009 **Quality:** -	To describe frequency of psychiatric nurses' self-reported interventions to address smoking, and to explore associations between nurses' demographic and professional characteristics and awareness of Tobacco Free Nurses and the 5A's	**Method:** Survey **Population:** Nurses **Sample size:** 100 **Setting:** Inpatient	USA
Author: Secker-Walker **Year:** 1994 **Quality:** +	To assess and compare the smoking cessation counselling activities of different health professional groups	**Method:** Survey **Population:** Mental health counsellors **Sample size:** 80 **Setting:** Community	USA

Author: Sharp **Year:** 2009 **Quality:** +	To assess psychiatric nurses' perspectives concerning tobacco dependence intervention	**Method:** Survey **Population:** Psychiatric nurses **Sample size:** 1381 **Setting:** Inpatient and community	USA
Author: Sidani **Year:** 2011 **Quality:** +	To examine the smoking cessation beliefs of clinical mental health counsellors and their practices with clients	**Method:** Survey **Population:** Clinical mental health counsellors **Sample size:** 330 **Setting:** Inpatient and community	USA
Author: Tong **Year:** 2010 **Quality:** +	To describe the smoking prevalence, smoking cessation practices, and beliefs for multiple types of mental health professionals, and factors associated with self-reported delivery of tobacco dependence treatments	**Method**: Survey **Population**: Mental health professionals **Sample size**: 2804 (of which 400 psychiatrists) **Setting**: Inpatient and community	USA
Author: Williams **Year:** 2009 **Quality:** +	To develop and implement a 2-day continuing education curriculum called "Treating Tobacco Dependence in Mental Health Setting"	**Method:** Survey **Population:** Mental health workers **Sample size:** 71 **Setting:** Inpatient and community	USA
Author: Wye **Year:** 2009 **Quality:** ++	To identify smoking policies and procedures in public psychiatric inpatient units	**Method:** Survey **Population:** Nurse/unit managers **Sample size:** 123 **Setting:** Inpatient	USA
Author: Zvolensky **Year:** 2005 **Quality:** -	To gauge the degree of basic cessation counselling provided by practitioners specialising in anxiety treatment disorders	**Method:** survey **Population:** Mental health professionals **Sample size:** 75 **Setting:** Inpatient and community	USA

QUESTION 3A. WHICH STRATEGIES/APPROACHES USED BY SECONDARY CARE MENTAL HEALTH SERVICES ARE EFFECTIVE FOR: PROVIDING PEOPLE FROM THE POPULATION OF INTEREST WITH SMOKING CESSATION INFORMATION, ADVICE AND SUPPORT?

Eighteen of the included studies discussed the strategies or approaches used for providing patients with mental illness with smoking cessation information, advice and support **[Ashton 2010, USA, S+; Essenmacher 2008, USA, S+; Himelhoch 2003, USA, S+; Johnson 2009, Canada, S+; Parker 2012, England, MM+; Price 2007a, USA, S-; Price 2007b, USA, S+; Prochaska 2005, USA, S+; Ratschen 2010b, England, Q++; Sarna 2009, USA, S-; Secker-Walker 1994, USA, S+; Sharp 2009, USA, S+; Sidani 2011, USA, S+; Solty 2009, Canada, S+; Tong 2010, USA, S+; Williams 2009, USA, S+; Wye 2009, Australia, S++; Zvolensky 2005, USA, S-]**. The methods and findings of the studies are presented briefly in Table 7.

In one survey of 123 unit managers, only a small minority of respondents reported their personnel monitored or audited documentation on the provision of smoking care to patients, and the majority of respondents reported that it was usually a staff member's decision whether they provided smoking cessation advice **[Wye 2009, Australia, S++].**

In four studies, the majority of psychiatrists and psychiatric nurses reported providing advice to quit to their patients **[Price 2007a, USA, S-; Sharp 2009, USA, S+; Tong 2010, USA, S+; Williams 2009, USA, S+]**. However, in seven studies, lower rates for providing advice to quit were seen in adolescent and child psychiatrists **[Price 2007b, USA, S+]**, physicians **[Solty 2009,Canada, S+]**, psychiatric nurses **[Sarna 2009, USA, S-; Solty 2009, Canada, S+]**, clinical and non-clinical staff members **[Essenmacher 2008, USA, S+]**, psychiatry residents **[Prochaska 2005, USA, S+]**, and mental health counsellors or workers **[Ashton 2010, USA, S+; Secker-Walker 1994, USA, S+; Sidani 2011, USA, S+]**. Furthermore, in one study more than half of clinical and non-clinical staff members in inpatient settings perceived that patients were never offered smoking cessation services **[Essenmacher 2008, USA, S+]**, and all inpatients from a UK based acute psychiatric unit reported they had not received any detailed information or offers of comprehensive smoking cessation support **[Ratschen 2010b, England, Q++]**.

One recent study from the UK assessed the implementation of a tailored tobacco dependence service in mental health settings, and assessed its impact, and barriers and facilitators to implementation **[Parker 2012, England, MM+]**. This study initially conducted an audit in inpatient and community settings. The study found that only 24% of inpatients recorded as current smokers had received recorded advice on the risks of smoking.

Additionally, psychiatric nurses, psychiatry residents and medical health counsellors reported low rates of follow-up in their patients **[Prochaska 2005, USA, S+; Sarna 2009, USA, S-; Sidani 2011, USA, S+]**. In one study, a majority of mental health workers reported that they only discuss tobacco use if they were concerned about their patients' tobacco use or if the patient raised the issue **[Ashton 2010, USA, S+]**.

> "*If I notice they are coughing or showing other smoking related illness.*" **[Ashton 2010, USA, S+]**
> "*It's discussed if they identify it an issue.*" **[Ashton 2010, USA, S+]**

Additionally, in one study of inpatient and community based mental health professionals, on average, they dedicated seven minutes of their sessions to smoking cessation activities **[Zvolensky 2005, USA, S-]**. Furthermore, in one study of mental health counsellors, they reported the smoking cessation activities were focused on advertising patients to stop smoking and explained the dangers of smoking **[Secker-Walker 1994, USA, S+]**.

One study assessed the predictors of ever discussing tobacco use with patients, and found the significant predictors in a multivariate model were having a sympathetic attitude towards the role of the provider (OR 5.46, 95% CI 1.42 to 20.95), having greater confidence in providing smoking cessation counselling (OR 1.03, 95% CI 1.00 to .06), and having more years' experience in the mental health field (OR 6.25, 95% CI 1.62 to 23.76) **[Johnson 2009, Canada, S+]**.

Two studies described the rates of discussing or prescribing pharmacotherapies for smoking cessation **[Price 2007a, USA, S-; Tong 2010, USA, S+]**. High rates of discussing pharmacotherapies were reported in one study of psychiatrists **[Tong 2010, USA, S+]**, whereas low rates of prescribing were reported in the other study of community based psychiatrists **[Price 2007a, USA, S-]**. Additionally, in a further study, patients with bipolar affective disorders were significantly more likely to receive smoking cessation counselling than patients with depressive disorders (14.7% versus 10.5%; adjusted OR 1.80, 95% CI 1.08 to 3.00). However, no significant differences were seen when comparing psychosis or anxiety disorders to depressive disorders **[Himelhoch 2003, USA, S+]**.

EVIDENCE STATEMENTS

ES 13.1 There is moderate evidence to suggest that psychiatrists and psychiatric nurses based in the US from inpatient and outpatient settings regularly provide their patients with smoking cessation advice **[Price 2007a, USA, S-; Sharp 2009, USA, S+; Tong 2010, USA, S+; Williams 2009, USA, S+]**; however, low rates of providing advice on smoking cessation were seen in a number of studies **[Ashton 2010, USA, S+; Essenmacher 2008, USA, S+; Parker 2012, England, MM+; Price 2007b, USA, S+; Prochaska 2005, USA, S+; Sarna 2009, USA, S-; Secker-Walker 1994, USA, S+; Sidani 2011, USA, S+; Solty 2009, Canada, S+]**.There is moderate evidence to suggest that inpatients from a UK based acute psychiatric unit were not offered any form of comprehensive smoking cessation support **[Ratschen 2010b, England, Q++]**.

ES 13.2 There is weak evidence from the USA to suggest psychiatric nurses, psychiatry residents, and medical health counsellors predominately from inpatient settings infrequently followed up regarding smoking cessation support for their patients **[Prochaska 2005, USA, S+; Sarna 2009, USA, S-; Sidani 2011, USA, S+]**.

ES 13.3 There is weak evidence from the USA to suggest inpatient and outpatient based psychiatrists regularly discuss pharmacotherapies **[Tong 2010, USA, S+]**, and community based psychiatrists infrequently prescribe smoking cessation pharmacotherapies **[Price 2007a, USA, S+]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Only two of the studies were conducted in the UK **[Parker 2012, England, MM+; Ratschen 2010b, England, Q++]**, and no further studies were conducted in a country which was deemed to be similar to that of the UK setting.

Table 7 Characteristics of included studies – Providing information, advice and support to patients

Author, year, quality	Aim of the study	Method, population, and setting	Location
Author: Ashton **Year**: 2010 **Quality**: +	To assess mental health workers' attitudes to addressing patients' tobacco use and to identify any perceived barriers that prevent people with mental illness from receiving the support they require to tackle tobacco use	**Method**: Survey **Population**: Adult mental health workers **Sample size**: 324 **Setting**: Inpatient and community	Australia
Author: Essenmacher **Year**: 2008 **Quality**: +	To determine staff's characteristics that are associated with attitudes about providing cessation services to veteran patients with psychiatric illness	**Method**: Survey and interviews **Population**: Clinical and non-clinical staff members **Sample size**: 150 in survey, 8 interviews **Setting**: Inpatient	USA
Author: Himelhoch **Year**: 2003 **Quality**: +	To determine how often psychiatrists offer smoking-cessation counselling to their patients who smoke and which factors are independently associated with the relationship	**Method**: Survey **Population**: Physicians **Sample size:** 573 **Setting**: Community	USA
Author: Johnson **Year:** 2009 **Quality:** +	To describe mental health care providers' attitudes about tobacco use and confidence in providing effective smoking cessation intervention, personal smoking status, incorporation of smoking cessations interventions into practice	**Method:** Survey **Population:** Mental health care providers **Sample size:** 282 **Setting:** Community	Canada
Author: Parker **Year:** 2012 **Quality:** +	To implement a tailored tobacco dependence service in mental health settings and assess its impact, and barriers and facilitators to implementation	**Method:** Mixed methods **Population:** Mental health professional advisers supporting patients and staff who are smokers **Sample size:** Two advisors reporting on barriers and facilitators relating to 2038 community patients and 4 acute and 2 rehabilitation wards containing a total of 129 beds **Setting:** Inpatient and community	England
Author: Price **Year**: 2007a **Quality**: -	To explore psychiatrists'' perceptions and practices relating to treating smoking in patients, and to examine whether these perceptions and practices varied by psychiatrists' characteristics	**Method**: Survey **Population**: Psychiatrists **Sample size**: 78 **Setting**: Community	USA
Author: Price **Year**: 2007b **Quality**: +	Practice and perceptions of smoking cessation activities among child and adolescent psychiatrists	**Method**: Survey **Population**: Psychiatrists **Sample size**: 184 **Setting**: Community	USA

Author: Prochaska **Year**: 2005 **Quality**: +	To assess the need for and interest in tobacco cessation curricula in psychiatric residency training	**Method**: Survey **Population**: Psychiatry residents **Sample size**: 105 **Setting**: Inpatient	USA
Author: Ratschen **Year:** 2010b **Quality:** ++	To explore patients' experiences, smoking behaviour and symptoms of nicotine withdrawal in the context of a comprehensive smoke-free policy on mental health acute wards, and to identify options for the future to promote and support smoking cessation and/or reduction in these settings	**Method:** Semi-structured interviews **Population:** Patients admitted to acute care inpatient psychiatry unit **Sample size:** 15 **Setting:** Inpatient	England
Author: Sarna **Year**: 2009 **Quality**: -	To describe frequency of psychiatric nurses' self-reported interventions to address smoking, and to explore associations between nurses' demographic and professional characteristics and awareness of Tobacco Free Nurses and the 5A's	**Method**: Survey **Population**: Nurses **Sample size**: 100 **Setting**: Inpatient	USA
Author: Secker-Walker **Year:** 1994 **Quality:** +	To assess and compare the smoking cessation counselling activities of different health professional groups	**Method:** Survey **Population:** Mental health counsellors **Sample size:** 80 **Setting:** Community	USA
Author: Sharp **Year:** 2009 **Quality:** +	To assess psychiatric nurses' perspectives concerning tobacco dependence intervention	**Method:** Survey **Population:** Psychiatric nurses **Sample size:** 1381 **Setting:** Inpatient and community	USA
Author: Sidani **Year**: 2011 **Quality**: +	To examine the smoking cessation beliefs of clinical mental health counsellors and their practices with clients	**Method**: Survey **Population**: Clinical mental health counsellors **Sample size**: 330 **Setting**: Inpatient and community	USA
Author: Solty **Year**: 2009 **Quality**: +	To determine the prevalence of cigarette smoking and the degree of nicotine dependence, and to assess smokers attitudes towards smoking, motivation to quitting, and the frequency that advice to quit was provided	**Method**: Survey **Population**: Patients admitted to acute care inpatient psychiatry unit **Sample size**: 211 **Setting**: Inpatient	Canada
Author: Tong **Year**: 2010 **Quality**: +	To describe the smoking prevalence, smoking cessation practices, and beliefs for multiple types of mental health professionals, and factors associated with self-reported delivery of tobacco dependence treatments	**Method**: Survey **Population**: Mental health professionals **Sample size**: 2804 (of which 400 psychiatrists) **Setting**: Inpatient and community	USA
Author: Williams **Year**: 2009 **Quality**: +	To develop and implement a 2-day continuing education curriculum called "Treating Tobacco Dependence in Mental Health Setting"	**Method**: Survey **Population**: Mental health workers **Sample size**: 71 **Setting**: Inpatient and community	USA
Author: Wye **Year**: 2009	To identify smoking policies and procedures in public psychiatric inpatient units	**Method**: Survey **Population**: Nurse/unit managers	USA

Quality: ++		**Sample size**: 123 **Setting**: Inpatient	
Author: Zvolensky **Year:** 2005 **Quality:** -	To gauge the degree of basic cessation counselling provided by practitioners specialising in anxiety treatment disorders	**Method:** survey **Population:** Mental health professionals **Sample size:** 75 **Setting:** Inpatient and community	USA

QUESTION 3B. WHICH STRATEGIES/APPROACHES USED BY SECONDARY CARE MENTAL HEALTH SERVICES ARE EFFECTIVE FOR: REFERRING PEOPLE FROM THE POPULATION OF INTEREST TO STOP SMOKING OR HOSPITAL BASED STOP SMOKING SERVICES?

Six of the included studies discussed referring patients to stop smoking services **[McNally 2010, England, MM+; Sharp 2009, USA, S+; Tong 2010, USA, S+; Weinberger 2008, USA, S-; Williams 2009, USA, S+]**. The methods and findings of the studies are presented briefly in Table 8.

In three studies, approximately half of psychiatrists and practice or psychiatric nurses reported referring their patients to smoking cessation services **[Sharp 2009, USA, S+; Tong 2010, USA, Q+; Williams 2009, USA, S+]**. In one study, the results demonstrated that mental health clinicians generally knew where to refer patients that were interested in smoking cessation **[Weinberger 2008, USA, S-]**. One study reported that psychiatric nurses were more likely to refer their patients to stop smoking services if the nurses were more highly motivated, valued tobacco dependence interventions, and perceived their clients to be more motivated to stop smoking than nurses who didn't refer their patients **[Sharp 2009, USA, S+]**. Additionally, the study reported psychiatric nurses who worked in agencies that referred their patients were significantly more knowledgeable about smoking cessation pharmacotherapies, counselling strategies and available resources than those that didn't work in agencies which referred patients **[Sharp 2009, USA, S+]**. Furthermore, the study reported the smoking behaviour of the nurse was not an influential factor in determining whether they referred patients **[Sharp 2009, USA, S+]**.

However, in a UK based survey of 27 service managers and mental health lead senior staff from Stop Smoking Services the vast majority of respondents reported they never or very rarely received referrals from inpatients with mental illnesses **[McNally 2010, England, MM+]**. The UK based survey also found that the majority of respondents reported the mental health status of their clients was generally not known **[McNally 2010, England, MM+]**. One recent study from the UK assessed the implementation of a tailored tobacco dependence service in mental health settings, and assessed its impact, and barriers and facilitators to implementation **[Parker 2012, England, MM+]**. This study initially conducted an audit in inpatient and community settings. The study found that only one inpatient had been referred to the NHS Stop Smoking Service.

EVIDENCE STATEMENTS

ES 14. 1 There is moderate evidence to suggest that in the US approximately half of mental health staff from inpatient and outpatient settings refer their patients to stop smoking services **[Sharp 2009, USA, S+; Tong 2010, USA, S+; Williams 2009, USA, S+]**, and weak evidence from the USA to suggest that inpatient and outpatient based psychiatric nurses are more likely to refer their patients if they are more highly motivated, valued tobacco dependence interventions, and perceived their patients to be more motivated to stop smoking **[Sharp 2009, USA, S+]**. However, there is weak evidence from the UK to suggest that virtually no inpatients are referred to a NHS Stop Smoking Service **[Parker 2012, England, MM+]**.

ES 14. 2 There is recent evidence from the UK to suggest that virtually no inpatients are referred to a NHS Stop smoking Service **[Parker 2012, England, MM+]**, and Stop Smoking Services never or rarely receive referrals from inpatients with mental illnesses **[McNally 2010, England, MM+]**.

ES 14. 3 There is weak evidence to suggest the mental health status of clients attending stop smoking services in the UK is not known **[McNally 2010, England, MM+]**.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Two of the included studies were conducted in the UK **[McNally 2010, England, MM+; Parker 2012, England, MM+]**.

Table 8 Characteristics of included studies – Referring patients to services

Author, year, quality	Aim of the study	Method, population, and setting	Location
Author: McNally **Year**: 2010 **Quality**: +	To examine whether smoking cessation services are following guidance on delivery of services to patients with mental illness	**Method**: Survey and interviews **Population**: NHS Stop Smoking Services staff **Sample size**: 27 **Setting**: Community	England
Author: Parker **Year:** 2012 **Quality:** +	To implement a tailored tobacco dependence service in mental health settings and assess its impact, and barriers and facilitators to implementation	**Method:** Mixed methods **Population:** Mental health professional advisers supporting patients and staff who are smokers **Sample size:** Two advisors reporting on barriers and facilitators relating to 2038 community patients and 4 acute and 2 rehabilitation wards containing a total of 129 beds **Setting:** Inpatient and community	England
Author: Sharp **Year**: 2009 **Quality**: +	To assess psychiatric nurses' perspectives concerning tobacco dependence intervention	**Method**: Survey **Population**: Psychiatric nurses **Sample size**: 1381 **Setting**: Inpatient and community	USA
Author: Tong **Year**: 2010 **Quality**: +	To describe the smoking prevalence, smoking cessation practices, and beliefs for multiple types of mental health professionals, and factors associated with self-reported delivery of tobacco dependence treatments	**Method**: Survey **Population**: Mental health professionals **Sample size**: 2804 (of which 400 psychiatrists) **Setting**: Inpatient and community	USA
Author: Weinberger **Year**: 2008 **Quality**: -	To examine the attitudes of clinicians regarding smoking cessation for psychiatric and substance abusing patients	**Method**: Survey **Population**: Mental health clinicians **Sample size**: 34 **Setting**: Inpatient	USA
Author: Williams **Year**: 2009 **Quality**: +	To develop and implement a 2-day continuing education curriculum called "Treating Tobacco Dependence in Mental Health Setting"	**Method**: Survey **Population**: Mental health workers **Sample size**: 71 **Setting**: Inpatient and community	USA

QUESTION 4. HOW CAN COMMUNITY, PRIMARY, AND SECONDARY CARE MENTAL HEALTH CARE PROVIDERS COLLABORATE MORE EFFECTIVELY TO INTEGRATE SMOKING CESSATION SUPPORT WITHIN CARE PATHWAYS?

Two studies were identified which discussed whether health care providers should collaborate more effectively together to integrate smoking cessation support **[Morris 2009, USA, Q+; Ratschen 2009b, England, Q+]**. One study assessed the impact of implementing a tailored tobacco dependence service in mental health settings in the UK **[Parker 2012, England, MM+]**. The methods and findings of the studies are presented briefly in Table 9.

In a UK based study, ward staff perceived an effective smoking cessation support service for patients with mental illness would be provided if support relating to smoking and smoking cessation were integrated into the health care plan of their patients **[Ratschen 2009b, England, Q+]**. They suggested that this should include having structured discussions with key workers and doctors during the inpatient stay, and ensuring collaborations between the inpatient and community teams. Staff also perceived the need for facilitating tailored smoking cessation and smoking reduction programmes through the local stop smoking services **[Ratschen 2009b, England, Q+]**.

In a further study, mental health administrator staff discussed a strategy for implementing smoking cessation across practices which would be useful for building an early record of success **[Morris 2009, USA, Q+]**. They suggested that the mental health practices which had a strong interest in smoking cessation should become the first to adopt smoking cessation practices, rather than making smoking cessation support compulsory for all services to implement **[Morris 2009, USA, Q+]**. Additionally, champions identified from case managers, nurses and psychiatrists within each mental health service were thought to be the most ideal way to develop strategic partnerships to fully implement smoking cessation strategies **[Morris 2009, USA, Q+]**.

One recently published study from the UK, assessed the implementation of a tailored tobacco dependence service in mental health settings and assessed its impact, and barriers and facilitators to implementation **[Parker 2012, England, MM+]**. The study was a pragmatic pilot project which used an integrative service model to smoking cessation and reduction in the UK's largest mental health trust between October 2010 and June 2011. The researchers performed an audit of current procedures on four acute and two rehabilitation wards and in the community setting using the recovery team.

The audit identified that the mental health trust had no targets to reducing smoking or treating smoking. Additionally, there was a lack of resources to achieve the aims as set out in the smoke free policy, including the unavailability of NRT stock and tobacco dependence treatment guidelines.

Following the audit, the research team developed and implemented a tailored tobacco dependence service. This included providing staff training, dissemination of the audit results, development of

recording instruments and collaborative pathways, closer liaison with management and consultants, and dissemination of the project results. Furthermore, two mental health professional advisors were recruited to provide support to patients and staff who smoked to enable them to follow a structured quit and assisted reduction programmes. The quit programme provided flexible support, which focused on individual goal setting, with the option of using NRT. The reduction programme was tailored to the needs of the clients using either individual and group formats, and allowed for the use of motivational interviewing, cognitive behavioural therapy, and combination NRT. A peer-support component involving 'quit stories' from successful quitters was also integrated into the programmes. Both programmes included the option to set up referral and community pathways, including an online referral to the local NHS Stop Smoking Service.

During the pilot phase, a total of 110 patients engaged with the service. All inpatients were approached and offered advice and support if they smoked. All patients who accepted prefer an individual format of support. Approximately half of inpatients who accepted the offer of support opted to have NRT to aid cessation (47%). In the community based patients, 75 patients accepted the offer of a referral for smoking cessation from the programme advisors, of which nearly half were based on self-referrals. Fifty-three (70%) patients had at least one appointment with an advisor, and 24 (45%) used NRT to aid cessation. Eight staff members also took part in the programme during the pilot project and made a quit attempt, of which half successfully quit smoking.

EVIDENCE STATEMENTS

ES 15. 1 There was weak evidence from one UK study to suggest that ward staff perceived smoking cessation should be integrated into the inpatient based health care plan of the patient, and strong collaborations should be formed between key workers and doctors during the inpatient stay, and between inpatient and community teams **[Ratschen 2009b, England, Q+]**.

ES 15. 2 There was weak evidence from one UK study to suggest that ward staff perceived smoking cessation and smoking reduction should be tailored to the needs of the inpatients with mental illness, with support being provided through local stop smoking services **[Ratschen 2009b, England, Q+]**.

ES 15.3 There was weak evidence from the USA to suggest that community based mental health administrator staff perceived a useful facilitator for implementing smoking cessation across practices would be to first adopt smoking cessation support only in the practices in which there was a strong interest in smoking cessation, so that an early success could be demonstrated; rather than enforcing all practices to have smoking cessation support **[Morris 2009, USA, Q+]**.

ES15.4 There was recent evidence from the UK to suggest that implementing a tailored tobacco dependence service in the UK's largest mental health trust through the development of an integrated smoking care pathway, whilst offering flexible support for smoking cessation and reduction programmes through the use of dedicated staff to provide the service, resulted in a modest service uptake rate overall. However, in the inpatient setting, where smokers can be easily identified due to smoking status recording being mandatory, almost a quarter of all smokers engaged with the service.

Applicability: The evidence has partial applicability to the current UK settings and/or practices. Two studies were conducted in a UK setting **[Parker 2012, England, MM+; Ratschen 2009b, England, Q+]**, therefore the evidence from these studies is likely to be directly applicable.

Table 9 Characteristics of included studies – Collaboration between healthcare providers

Author, year, quality	Aim of the study	Method, population, and setting	Location
Author: Morris **Year**: 2009 **Quality**: +	To understand the factors that impede and support tobacco cessation efforts from the perspective of both community mental health patients and providers	**Method**: Focus groups **Population**: Mental health service users **Sample size**: 19 **Setting**: Community	USA
Author: Parker **Year:** 2012 **Quality:** +	To implement a tailored tobacco dependence service in mental health settings and assess its impact, and barriers and facilitators to implementation	**Method:** Mixed methods **Population:** Mental health professional advisers supporting patients and staff who are smokers **Sample size:** Two advisors reporting on barriers and facilitators relating to 2038 community patients and 4 acute and 2 rehabilitation wards containing a total of 129 beds **Setting:** Inpatient and community	England
Author: Ratschen **Year**: 2009b **Quality**: +	To explore the practical implications of, and problems arising from, the implementation of a comprehensive smoke-free policy	**Method**: Interviews **Population**: Ward staff **Sample size**: 16 **Setting**: Inpatient	England

DISCUSSION

This review of barriers and facilitators for smoking cessation in secondary mental health services comprises of a large body of evidence. Forty-six primary studies, one critical review, and two discussion pieces were identified. The majority of the studies assessed the barriers for smoking cessation in mental health populations as identified by staff members, with fewer studies reporting the views of patients. Additionally, only one study reported the views of relatives. One recent study in the UK assessed the impact of implementing a tailored tobacco dependence service in mental health settings. The majority of studies were conducted in the US, with few studies from other countries, and only ten studies were identified from the UK setting. The methodological quality of the studies was very variable, with only 12 studies being awarded the highest quality.

Overall the evidence suggests:

- Inpatients' and outpatients' perceive the following are reasons for smoking:
    - To gain autonomy
    - Nicotine addiction
    - Pleasure and enjoyment
    - Relaxation and to calm down
    - Sense of companionship and form of social pastime
    - Self-medication to cope with symptoms of mental illness, with patients' fearing quitting might result in deterioration.

- Patients' perceive cigarettes are used as a mechanism of control in inpatient settings.

- Inpatients' and outpatients' perceive nicotine addiction, lack of motivation, stress, severity of mental health symptoms, smoking in peers, family and staff, are barriers to making a quit attempt. Additionally, outpatients perceive a lack of knowledge regarding which strategies are effective for smoking cessation, and the negative views of staff, are important barriers to making a quit attempt.
- Inpatients' and outpatients' perceive worrying about their physical health, influence of peer, family and social pressures to quit, high cost of cigarettes, are facilitators to quitting smoking, with some outpatients expressing that they would need to experience a negative health effect before making a quit attempt. However, some inpatients' and outpatients' perceive there is little point in quitting as it would not have a direct effect on recovery from their mental illness, improve quality of life or health.

- Mixed beliefs were expressed by inpatients' regarding whether NRT was effective for smoking cessation; and some inpatients' expressed that they would prefer to not take further medications beyond those already taking for their mental illness. Additionally, cost of NRT was a barrier to using NRT in outpatients; however, patients were not aware that NRT

could be acquired on prescription and so would have been free to those entitled to free prescriptions.

- Outpatients' perceived the offer of behavioural support would be useful during their quit attempt, however, they perceived group behavioural therapy would not be as effective an individual behavioural therapy.
- Outpatients perceived the following to be important facilitators to successfully quitting using behavioural support: being able to dictate how many sessions were received, ability to have support offered in informal and non-clinical setting, receiving support tailored to the needs of patients with mental illness, and involving one or more persons with a history of mental illness who had successfully quit smoking.
- Outpatients' perceived the smoking cessation advisor should be supportive, take a non-judgmental approach to quitting, maintain a positive expectation in the patients' ability to quit, act as an advocate during the quit attempt, and have a good knowledge of mental health problems, and how smoking and quitting can impact on their mental health.
- Inpatients' perceived that an inpatient setting was not a suitable environment for initiating smoking cessation support.
- Outpatients' perceive monetary incentives could be an effective intervention for smoking cessation. Inpatients' and outpatients' perceived they would find it easier if the goal was to cut down rather than quit.

- Staff in general believe that smoking is a patient choice and they perceive benefits to smoking such as patients enjoying smoking, using smoking as a coping mechanism, and as a means of self-medication to control mental illness symptoms. They believe that allowing patients to smoke reduces the likelihood of aggression and violence, thereby ensuring a smoother running of inpatient settings. However staff also perceived cigarettes were used as a form of currency or means of control to achieve compliance and develop a rapport with patients.

- Staff, from inpatient and outpatient settings, have the misconception that patients with mental health conditions are not able to stop smoking; with some staff from inpatient and outpatient settings actively discouraging patients from quitting. However, other staff, from inpatient and outpatient settings, felt that the patients should have their smoking addressed.
- The smoking status of the staff, predominately from inpatient settings, was a barrier to providing smoking cessation support, where smokers were more likely to have negative views about smoking cessation and reduction. The overt use of tobacco by staff members was perceived as a barrier to patients' quitting smoking.
- There were mixed beliefs regarding whether staff thought providing smoking cessation was part of their role, with the majority of staff from inpatient and outpatient settings feeling that it was not part of their role.

- Community based psychiatrists perceived patients had a preoccupation with other health or medical complaints, and thus smoking cessation would not be a priority for patients.
- Staff from inpatient settings perceived quitting smoking would have a detrimental effect on the mental health symptoms of the patient, and mental health professionals were worried about the effect of quitting smoking on the effectiveness of the patients' medication for mental illnesses.

- Staff perceived barriers to quitting in patients are boredom; increased stress; tobacco dependence; a lack of motivation; social isolation; and a lack of alternative activities were barriers to quitting smoking in patients with mental illness.
- Difficulties in engaging with and retaining patients in a tobacco dependence service were sometimes encountered and ascribed to factors relating to motivation and attention.
- Many staff lacked formal training in smoking cessation. Staff felt a lack of confidence in providing smoking cessation support to patients with mental health conditions resulting from a lack of training during their education and whilst in post, with education in behavioural support increasing confidence**.** Furthermore, staff described wanting more training in smoking cessation.

- Staff, predominately from outpatient settings, perceived the lack of prioritising smoking cessation support either in the mental health service or as part of the staff's workload, and the lack of setting targets for treating patients, were major barriers to offering stop smoking support.
- Staff, from inpatient and outpatient settings, perceived that they are not able to dedicate sufficient time to provide smoking cessation support during their role due to conflicting priorities.

- Staff, from inpatient and outpatient settings, perceived NRT was not effective in mental health populations for smoking cessation. Community based psychiatrists considered the safety of NRT use in adolescents and children with mental health conditions was a major barrier to using NRT for smoking cessation. Compliance with medication regimen, and a worry regarding whether NRT interfered with antipsychotic medications, were barriers to using NRT. Smoking cessation advisors reported staff had concerns regarding the 'harmful effect' and expense to the Trust of NRT

- Staff, predominately from outpatient settings in the US, thought a major barrier to providing smoking cessation support in patients with mental health conditions was the lack of resources and re-imbursement for smoking cessation interventions from the state.
- Staff, predominately from inpatient settings, perceived patients had a lack of information and support relating to smoking cessation support.

- Staff from the US, based on inpatient and outpatient settings, regularly asked the smoking status of patients with mental illness. Staff described routine systems were used to identify patients who smoked predominately from outpatient settings, including consulting the patients' chart; however, a substantial proportion of staff, predominately from outpatient settings, never document the smoking status of patients with mental illness.
- An audit from the UK identified whilst recording of smoking status was mandatory for inpatients, there was no such requirement for community based patients in a large Trust

- Rates of providing smoking cessation advice to patients in inpatient and outpatient settings varied considerably between studies; additionally, low rates for follow-up contacts relating to smoking cessation for their patients following support were seen in inpatient settings.

- Approximately half of staff from the US from inpatient and outpatient settings referred their patients to stop smoking services. However, stop smoking services in the UK never or rarely receive referrals from inpatients with mental illnesses. Additionally, the mental health status of clients attending stop smoking services in the UK is not known. An audit from the UK identified virtually no inpatients were referred to a NHS Stop Smoking Service.

- Staff perceived smoking cessation should be integrated into the inpatient based health care plan of the patient, and strong collaborations should be formed between key workers and doctors during the inpatient stay, and between inpatient and community teams. Additionally, smoking cessation and smoking reduction should be tailored to the needs of the inpatients with mental illness, with support being provided through local stop smoking services.
- Staff perceived smoking cessation support should be adopted first in practices in which there was a strong interest in smoking cessation.
- Implementing a tailored tobacco dependence service in the UK's largest mental health trust through the development of an integrated smoking care pathway, whilst offering flexible support for smoking cessation and reduction programmes through the use of dedicated staff to provide the service, resulted in a modest service uptake rate overall. However, in the inpatient setting, where smokers can be easily identified due to smoking status recording being mandatory, almost a quarter of all smokers engaged with the service.

None or very few studies were identified which assessed:

- The views, attitudes, and beliefs of household members and relatives of patients with mental illness regarding barriers of, and facilitators for, smoking cessation
- Views, attitudes, and beliefs, regarding barriers of, and facilitators for, using interventions for temporary abstinence
- Whether there were differences in views, attitudes and beliefs by age, gender, socioeconomic status, sexual orientation, disability, religion, and severity of dependence.

The review was conducted whilst adhering to a high methodological quality where a comprehensive and systematic search strategy was used based on searching multiple electronic databases, websites, and reference screening. Additionally, double screening of titles, abstracts and full texts were performed independently, and moderate agreements rates were seen for screening, data extraction and quality assessments. However, the review is not without limitations. Due to tight time constraints, authors of the original studies could not be contacted to provide further information where necessary. Additionally, the evidence from this review is based predominately on a narrative summary rather than using a formal meta-synthesis approach. However, this review highlights the urgent need for further high quality research to be performed to assess the views, attitudes and beliefs of patients, staff members and relatives so that a full assessment can be made regarding whether the acceptability of interventions for smoking cessation and temporary abstinence differ by age, gender, socioeconomic status, sexual orientation, disability, religion, and severity of dependence.

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SMOKING CESSATION IN MENTAL HEALTH SERVICES

Review 5: Barrier and Facilitators of Smoking Cessation Interventions in Mental Health

APPENDICES

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November 2021: NICE guidelines PH45 (June 2013) and PH48 (November 2013) have been updated and replaced by NG209. The recommendations labelled [2013] or [2013, amended 2021] in the updated guideline were based on these evidence reviews. See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

CONTENTS PAGE

APPENDIX 1A. SEARCH STRATEGY

AMED (ALLIED AND COMPLEMENTARY MEDICINE)

Database host: OVID
Database coverage dates: 1985-current
Search date: 3/2/2012
Number of records: 53
Date limits: 1985-2012

1 SMOKING CESSATION/ 135
3 SMOKING/ 245
4 1 OR 3 364
5 NEUROTIC DISORDERS/ OR PSYCHOTIC DISORDERS/ OR SCHIZOPHRENIA/ OR DELIRIUM/ OR AMNESIA/ OR ADJUSTMENT DISORDERS/ OR MENTAL DISORDERS/ OR exp PERSONALITY DISORDERS/ OR exp SOMATOFORM DISORDERS/ OR exp EATING DISORDERS/ OR exp DISSOCIATIVE DISORDERS/ OR exp DEMENTIA/ OR exp COGNITION DISORDERS/ OR exp CHILD MENTAL DISORDERS/ OR exp ANXIETY DISORDERS/ OR exp AFFECTIVE DISORDERS/ 16325
6 RETT SYNDROME/ 37
7 REHABILITATION CENTERS/ 258
8 MENTAL HEALTH/ 996
9 MENTAL HEALTH SERVICES/ OR COMMUNITY MENTAL HEALTH SERVICES/ 1152
10 ALZHEIMERS DISEASE/ 705
12 COGNITION DISORDERS/ 1495
13 ATTENTION DEFICIT DISORDER WITH HYPERACTIVITY/ 515
14 CHILD BEHAVIOR DISORDERS/ 362
15 MOTOR SKILLS DISORDERS/ 108
16 DYSLEXIA/ 230
17 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 12 OR 13 OR 14 OR 15 OR 16 18234
18 (("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective ADJ1 disorder$) OR (avoidant ADJ1 personalit*) OR (behavio* problem$) OR (behavio* ADJ1 disorder$) OR (conversion ADJ1 disorder$) OR (eating ADJ1 behavio*) OR (eating ADJ1 disorder$) OR (overactive ADJ1 disorder$) OR (personality ADJ3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic ADJ1 person*) OR (antisocial ADJ1 person*) OR anxiety OR anxious OR (person* ADJ1 asocial) OR Asperger* OR autism OR autistic OR (person* ADJ1 avoidant) OR bipolar* OR (borderline ADJ1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive ADJ1 person*) OR (conversion ADJ1 disorder$) OR cyclothymia OR delusion* OR (dependent ADJ1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* ADJ1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* ADJ1 histrionic))).ti,ab 11528
19 (((histrionic ADJ1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic ADJ1 person*) OR (person* ADJ1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* ADJ1 obsessive) OR (obsessive ADJ1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* ADJ1 passive-aggressive) OR (passive-aggressive ADJ1 person*) OR phobia$ OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR (rett ADJ2 s) OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure ADJ1 unit$) OR (secure ADJ1 hospital$) OR amnesi* OR hypomania OR cyclothymia OR dysthymia

OR dementia OR delirium OR hallucinosis OR delusional OR (mood ADJ2 disorder$) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance ADJ1 disorder$) OR (possession ADJ1 disorder$) OR obsessional OR "severe stress" OR (adjustment ADJ1 disorder$) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological ADJ1 disturbance$) OR (psychologically ADJ1 disturbed) OR suicid* OR parasuicid*)).ti,ab 12423
20 (((self ADJ1 harm*) OR (self ADJ1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder$" OR "mental health" OR "mental healthcare")).ti,ab 5250
21 (((anankastic ADJ personalit*) OR "anorexia nervosa" OR (antisocial ADJ personalit*) OR ("attention deficit" ADJ disorder$) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic ADJ personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")).ti,ab 1637
22 17 OR 18 OR 19 OR 20 OR 21 32825
23 ("temporary abstinence" OR (temporar* ADJ1 abstain*) OR (abstain* ADJ1 temporar*) OR (controlled ADJ1 smoking)).ti,ab 0
24 ((fading ADJ2 smok*) OR (temporary ADJ2 smok*) OR (cessat* ADJ2 smok*) OR (withdraw* ADJ2 smok*) OR (ceas* ADJ2 smok*) OR (stop* ADJ2 smok*) OR (schedul* ADJ2 smok*) OR (quit ADJ2 smok*) OR (quits ADJ2 smok*) OR (quitt* ADJ2 smok*) OR (reduc* ADJ2 smok*) OR (abstain* ADJ2 smok*) OR (prevent* ADJ2 smok*) OR (abstinence ADJ2 smok*) OR (restrict* ADJ2 smok*)).ti,ab 247
25 ((fading ADJ2 tobacco) OR (temporary ADJ2 tobacco) OR (cessat* ADJ2 tobacco) OR (withdraw* ADJ2 tobacco) OR (ceas* ADJ2 tobacco) OR (stop* ADJ2 tobacco) OR (schedul* ADJ2 tobacco) OR (quit ADJ2 tobacco) OR (quits ADJ2 tobacco) OR (quitt* ADJ2 tobacco) OR (reduc* ADJ2 tobacco) OR (abstain* ADJ2 tobacco) OR (prevent* ADJ2 tobacco) OR (abstinence ADJ2 tobacco) OR (restrict* ADJ2 tobacco)).ti,ab 17
26 ((fading ADJ2 cigarette$) OR (temporary ADJ2 cigarette$) OR (cessat* ADJ2 cigarette$) OR (withdraw* ADJ2 cigarette$) OR (ceas* ADJ2 cigarette$) OR (stop* ADJ2 cigarette$) OR (schedul* ADJ2 cigarette$) OR (quit ADJ2 cigarette$) OR (quits ADJ2 cigarette$) OR (quitt* ADJ2 cigarette$) OR (reduc* ADJ2 cigarette$) OR (abstain* ADJ2 cigarette$) OR (prevent* ADJ2 cigarette$) OR (abstinence ADJ2 cigarette$) OR (restrict* ADJ2 cigarette$)).ti,ab 8
27 (fading OR temporary OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit$ OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*).ti,ab 28635
28 ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars).ti,ab 28
29 27 AND 28 3
30 ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar* OR smok* OR tobacco).ti,ab 1106
31 ("give up" OR "gives up" OR "giving up").ti,ab 750
32 30 AND 31 2
33 4 OR 23 OR 24 OR 25 OR 26 OR 29 OR 32 449
34 22 AND 33 53
35 34 [Limit to: Publication Year 1985-Current] 53

ASSIA (Applied Social Science Index and Abstracts)

Database host: CSA Illumina
Database coverage dates: 1987-current
Search date: 31/1/2012
Number of records: 458
Date limits: 1985-2012

Search query: (((DE=("tobacco" or "cigarettes" or "cigars" or "snuff" or "ex smokers" or "heavy smoking" or "light smokers" or "moderate smoking" or "occasional smoking" or "smokers" or "smoking" or "tobacco smoke")) and(DE="cessation")) or((TI=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars) OR AB=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)) and(TI=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) OR AB=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*))) or(TI=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti) OR AB=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti)) or(TI=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*) OR AB=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*)) or(TI=("controlled smoking") OR AB=("controlled smoking")) or(TI=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*))) or(AB=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*)))) and((((DE=("psychiatric disorders" or "mental health" or "psychiatric nurses" or "psychiatric nursing" or "psychiatric social workers" or "mental illness" or "acrophobia" or "acute stress disorder" or "adjustment disorder" or "affective disorders" or "affective psychoses" or "agoraphobia" or "akathisia" or "alcoholic psychoses" or "alexithymia" or "anhedonia" or "animal phobias" or "anorexia nervosa" or "anthropophobia" or "anxiety disorders" or "asperger s syndrome" or "attachment disorders" or "attention deficit disorder" or "attention deficit hyperactivity disorder" or "autism" or "autistic spectrum disorders" or "behaviour

disorders" or "binge eating" or "bipolar affective disorder" or "bulimia nervosa" or "cacodemonomania" or "capgras syndrome" or "catatonia" or "cenesthopathy" or "character disorders" or "childhood depression" or "childhood disintegrative disorder" or "childhood separation anxiety" or "chronic posttraumatic stress disorder" or "chronic psychiatric disorders" or "chronic schizophrenia" or "claustrophobia" or "combat disorders" or "combat related posttraumatic stress disorder" or "communication disorders" or "community psychiatric nurses" or "community psychiatric nursing" or "compulsive buying" or "compulsive eating" or "compulsive foraging behaviour" or "conduct disorders" or "confusional states" or "conversion disorder" or "coprophagia" or "cotard s syndrome" or "death depression" or "delusional depression" or "delusional disorders" or "demonomania" or "dental phobia" or "depersonalization disorder" or "depression" or "disruptive behaviour disorders" or "dissociative disorders" or "dysmorphophobia" or "dysphagia" or "eating disorders" or "emotional disorders" or "erotophobia" or "folie a deux" or "forensic psychiatric nurses" or "forensic psychiatric nursing" or "fregoli syndrome" or "generalized anxiety disorders" or "head banging" or "heller s syndrome" or "hyperphagia" or "hypomania" or "impulse control disorders" or "infantile autism" or "insanity" or "koro" or "korsakoff s syndrome" or "liaison psychiatric nurses" or "liaison psychiatric nursing" or "litigious delusional disorders" or "mania" or "mass psychogenic illness" or "maternal depression" or "medium security units" or "melancholia" or "military psychiatric hospitals" or "mood incongruent psychoses" or "movement disorders" or "neurasthenia" or "neuroleptic malignant syndrome" or "neuroses" or "neuroticism" or "nocturnal panic disorder" or "obsessive compulsive neuroses" or "oppositional defiant disorder" or "organic mood syndrome" or "panic disorders" or "paranoia" or "paranoid schizophrenia" or "paranoid states" or "paraphrenia" or "parental depression" or "paternal depression" or "personality disorders" or "pervasive developmental disorders" or "phobias" or "pica" or "postabortion syndrome" or "postnatal depression" or "posttraumatic stress disorder" or "private psychiatric hospitals" or "psychiatric clinics" or "psychiatric day centres" or "psychiatric day hospitals" or "psychiatric hospitals" or "psychiatric morbidity" or "psychiatric nurse patient interactions" or "psychiatric services" or "psychiatric social work" or "psychiatric staff nurses" or "psychiatric units" or "psychogenic aspects" or "psychogenic polydipsia" or "psychoses" or "psychotic mood disorders" or "psychoticism" or "puerperal psychosis" or "purging" or "querulous paranoia" or "rapid eating" or "refractory depression" or "restlessness" or "rett syndrome" or "schizoaffective disorder" or "schizophrenia" or "schizophreniform disorder" or "school phobia" or "seasonal affective disorders" or "sectioned patients" or "selective mutism" or "separation anxiety" or "shared paranoid disorder" or "snake phobia" or "social phobia" or "somatoform disorders" or "special hospitals" or "spider phobia" or "stage fright" or "thought disorder" or "transference neuroses" or "travelling psychiatric day hospitals" or "unipolar disorders" or "vascular depression" or "weight phobia")) or(DE=("community mental health professionals" or "community mental health services" or "managed mental health care" or "mental health" or "mental health care" or "mental

health perspectives" or "mental health professionals" or "mental health promotion" or "mental health services" or "mental illness" or "preventive mental health care" or "primary mental health care" or "student mental health services" or "anxiety" or "anxiety depression" or "childhood depression" or "death depression" or "delusional depression" or "depression" or "neuroticism" or "outpatient commitment" or "phobic anxiety" or "psychiatric services" or "psychiatric units" or "psychological services" or "psychoticism" or "sectioned patients" or "sectioning" or "social anxiety" or "support bed units"))) or(TI=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems") OR AB=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")) or(TI=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)) OR AB=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive

OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic))) or(TI=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*) OR AB=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*)) or(TI=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare") OR AB=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare"))) or(DE=("rehabilitation units" or "homeless mentally ill men" or "homeless mentally ill people" or "homeless mentally ill women" or "homeless mentally ill young people" or "insane people" or "long term mentally ill people" or "longterm mentally ill people" or "mentally ill boys" or "mentally ill children" or "mentally ill deaf children" or "mentally ill deaf people" or "mentally ill elderly men" or "mentally ill elderly people" or "mentally ill elderly women" or "mentally ill men" or

"mentally ill mothers" or "mentally ill older people" or "mentally ill parents" or "mentally ill people" or "mentally ill women" or "mentally ill young adults" or "mentally ill young children" or "mentally ill young people" or "psychopaths" or "violent mentally ill people")))

BRITISH NURSING INDEX

Database host: OVID
Database coverage dates: 1985-current
Search date: 13/2/2012
Number of records: 127
Date limits: 1985-2012

92 ((((histrionic ADJ1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic ADJ1 person*) OR (person* ADJ1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* ADJ1 obsessive) OR (obsessive ADJ1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* ADJ1 passive-aggressive) OR (passive-aggressive ADJ1 person*) OR phobia$ OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR (rett ADJ2 s) OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure ADJ1 unit$) OR (secure ADJ1 hospital$) OR amnesi* OR hypomania OR cyclothymia OR dysthymia OR dementia OR delirium OR hallucinosis OR delusional OR (mood ADJ2 disorder$) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance ADJ1 disorder$) OR (possession ADJ1 disorder$) OR obsessional OR "severe stress" OR (adjustment ADJ1 disorder$) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological ADJ1 disturbance$) OR (psychologically ADJ1 disturbed) OR suicid* OR parasuicid*))).ti,ab 15217
93 ((((self ADJ1 harm*) OR (self ADJ1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder$" OR "mental health" OR "mental healthcare" AND))).ti,ab 11002
94 ((((anankastic ADJ personalit*) OR "anorexia nervosa" OR (antisocial ADJ personalit*) OR ("attention deficit" ADJ disorder$) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic ADJ personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems" AND))).ti,ab 1801
95 (("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective ADJ1 disorder$) OR (avoidant ADJ1 personalit*) OR (behavio* ADJ1 problem$) OR (behavio* ADJ1 disorder$) OR (conversion ADJ1 disorder$) OR (eating ADJ1 behavio*) OR (eating ADJ1 disorder$) OR (overactive ADJ1 disorder$) OR (personality ADJ3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic ADJ1 person*) OR (antisocial ADJ1 person*) OR anxiety OR anxious OR (person* ADJ1 asocial) OR Asperger* OR autism OR autistic OR (person* ADJ1 avoidant) OR bipolar* OR (borderline ADJ1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive ADJ1 person*) OR (conversion ADJ1 disorder$) OR cyclothymia OR delusion* OR (dependent ADJ1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* ADJ1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* ADJ1 histrionic))).ti,ab 9380
96 92 OR 93 OR 94 OR 95 31158
99 PSYCHIATRIC DISORDERS/ OR exp AUTISM/ OR exp CHILD PSYCHIATRY/ OR exp DEMENTIA/ OR exp DEPRESSION/ OR exp EATING DISORDERS/ OR exp ELDERLY : MENTAL HEALTH/ OR exp NEUROSES AND PHOBIAS/ OR exp POST-TRAUMATIC STRESS/ OR exp PSYCHOSOMATIC DISORDERS/ OR exp SCHIZOPHRENIA/ OR exp SELF HARM/ OR exp SECURE PSYCHIATRIC HOSPITALS/ 12644
100 exp PSYCHIATRIC PATIENTS/ OR exp PSYCHIATRIC NURSING/ OR exp MENTAL HEALTH/ OR exp CHILD PSYCHIATRY/ OR exp ELDERLY : MENTAL HEALTH/ OR exp PSYCHIATRIC NURSING : EDUCATION/ OR exp PSYCHIATRIC PATIENTS/ OR exp MENTAL HEALTH : SERVICES/ OR PSYCHIATRIC REHABILITATION/ OR exp MENTAL HEALTH : COMMUNITY CARE/ OR exp SECURE

PSYCHIATRIC HOSPITALS/ OR exp COMMUNITY PSYCHIATRIC NURSING/ OR exp PSYCHIATRIC SERVICES/ 14154
101 96 OR 99 OR 100 33517
102 SMOKING/ 2432
103 (("temporary abstinence" OR (temporar* ADJ1 abstain*) OR (abstain* ADJ1 temporar*) OR (controlled ADJ1 smoking))).ti,ab 0
104 (((fading ADJ2 smok*) OR (temporary ADJ2 smok*) OR (cessat* ADJ2 smok*) OR (withdraw* ADJ2 smok*) OR (ceas* ADJ2 smok*) OR (stop* ADJ2 smok*) OR (schedul* ADJ2 smok*) OR (quit ADJ2 smok*) OR (quits ADJ2 smok*) OR (quitt* ADJ2 smok*) OR (reduc* ADJ2 smok*) OR (abstain* ADJ2 smok*) OR (prevent* ADJ2 smok*) OR (abstinence ADJ2 smok*) OR (restrict* ADJ2 smok*))).ti,ab 1064
105 (((fading ADJ2 tobacco) OR (temporary ADJ2 tobacco) OR (cessat* ADJ2 tobacco) OR (withdraw* ADJ2 tobacco) OR (ceas* ADJ2 tobacco) OR (stop* ADJ2 tobacco) OR (schedul* ADJ2 tobacco) OR (quit ADJ2 tobacco) OR (quits ADJ2 tobacco) OR (quitt* ADJ2 tobacco) OR (reduc* ADJ2 tobacco) OR (abstain* ADJ2 tobacco) OR (prevent* ADJ2 tobacco) OR (abstinence ADJ2 tobacco) OR (restrict* ADJ2 tobacco))).ti,ab 60
106 (((fading ADJ2 cigarette$) OR (temporary ADJ2 cigarette$) OR (cessat* ADJ2 cigarette$) OR (withdraw* ADJ2 cigarette$) OR (ceas* ADJ2 cigarette$) OR (stop* ADJ2 cigarette$) OR (schedul* ADJ2 cigarette$) OR (quit ADJ2 cigarette$) OR (quits ADJ2 cigarette$) OR (quitt* ADJ2 cigarette$) OR (reduc* ADJ2 cigarette$) OR (abstain* ADJ2 cigarette$) OR (prevent* ADJ2 cigarette$) OR (abstinence ADJ2 cigarette$) OR (restrict* ADJ2 cigarette$))).ti,ab 8
108 (("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)).ti,ab 14
109 ((cigar* OR smok* OR tobacco) AND ("give up" OR "gives up" OR "giving up")).ti,ab 101
110 102 OR 103 OR 104 OR 105 OR 106 OR 108 OR 109 2558
111 101 AND 110 127

CDC Smoking and Health Resource Library database

Search date: 8/2/2012
Number of records: 24

Four separate searches undertaken and results scanned results on title, from this potentially relevant items were selected.
Search, using publication year 1985 – 1990:

1. psychiatric AND control (keywords)
2. psychiatric AND cessation (keywords)
3. mental AND cessation (keywords)
4. mental AND control (keywords)

CINAHL (Cumulative Index of Nursing and Allied Health Literature)

Database host: OVID
Database coverage dates: 1981-current
Search date: 6/2/2012
Number of records: 1805
Date limits: 1985-2012

1 (("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective ADJ1 disorder$) OR (avoidant ADJ1 personalit*) OR (behavio* problem$) OR (behavio* ADJ1 disorder$) OR (conversion ADJ1 disorder$) OR (eating ADJ1 behavio*) OR (eating ADJ1 disorder$) OR (overactive ADJ1 disorder$) OR (personality ADJ3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic ADJ1 person*) OR (antisocial ADJ1 person*) OR anxiety OR anxious OR (person* ADJ1 asocial) OR Asperger* OR autism OR autistic OR (person* ADJ1 avoidant) OR bipolar* OR (borderline ADJ1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive ADJ1 person*) OR (conversion ADJ1 disorder$) OR cyclothymia OR delusion* OR (dependent ADJ1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* ADJ1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* ADJ1 histrionic))).ti,ab
2 (((histrionic ADJ1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic ADJ1 person*) OR (person* ADJ1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* ADJ1 obsessive) OR (obsessive ADJ1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* ADJ1 passive-aggressive) OR (passive-aggressive ADJ1 person*) OR phobia$ OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR (rett ADJ2 s) OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure ADJ1 unit$) OR (secure ADJ1 hospital$) OR amnesi* OR hypomania OR cyclothymia OR dysthymia OR dementia OR delirium OR hallucinosis OR delusional OR (mood ADJ2 disorder$) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance ADJ1 disorder$) OR (possession ADJ1 disorder$) OR obsessional OR "severe stress" OR (adjustment ADJ1 disorder$) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological ADJ1 disturbance$) OR (psychologically ADJ1 disturbed) OR suicid* OR parasuicid*)).ti,ab
3 (((self ADJ1 harm*) OR (self ADJ1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder$" OR "mental health" OR "mental healthcare")).ti,ab
4 (((anankastic ADJ personalit*) OR "anorexia nervosa" OR (antisocial ADJ personalit*) OR ("attention deficit" ADJ disorder$) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic ADJ personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")).ti,ab
5 ("temporary abstinence" OR (temporar* ADJ1 abstain*) OR (abstain* ADJ1 temporar*) OR (controlled ADJ1 smoking)).ti,ab
6 ((fading ADJ2 smok*) OR (temporary ADJ2 smok*) OR (cessat* ADJ2 smok*) OR (withdraw* ADJ2 smok*) OR (ceas* ADJ2 smok*) OR (stop* ADJ2 smok*) OR (schedul* ADJ2 smok*) OR (quit ADJ2 smok*) OR (quits ADJ2 smok*) OR (quitt* ADJ2 smok*) OR (reduc* ADJ2 smok*) OR (abstain* ADJ2 smok*) OR (prevent* ADJ2 smok*) OR (abstinence ADJ2 smok*) OR (restrict* ADJ2 smok*)).ti,ab
7 ((fading ADJ2 tobacco) OR (temporary ADJ2 tobacco) OR (cessat* ADJ2 tobacco) OR (withdraw* ADJ2 tobacco) OR (ceas* ADJ2 tobacco) OR (stop* ADJ2 tobacco) OR (schedul* ADJ2 tobacco) OR (quit ADJ2 tobacco) OR (quits ADJ2 tobacco) OR (quitt* ADJ2 tobacco) OR (reduc* ADJ2 tobacco)

OR (abstain* ADJ2 tobacco) OR (prevent* ADJ2 tobacco) OR (abstinence ADJ2 tobacco) OR (restrict* ADJ2 tobacco)).ti,ab
8 ((fading ADJ2 cigarette$) OR (temporary ADJ2 cigarette$) OR (cessat* ADJ2 cigarette$) OR (withdraw* ADJ2 cigarette$) OR (ceas* ADJ2 cigarette$) OR (stop* ADJ2 cigarette$) OR (schedul* ADJ2 cigarette$) OR (quit ADJ2 cigarette$) OR (quits ADJ2 cigarette$) OR (quitt* ADJ2 cigarette$) OR (reduc* ADJ2 cigarette$) OR (abstain* ADJ2 cigarette$) OR (prevent* ADJ2 cigarette$) OR (abstinence ADJ2 cigarette$) OR (restrict* ADJ2 cigarette$)).ti,ab
9 (fading OR temporary OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit$ OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*).ti,ab
10 ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars).ti,ab
11 9 AND 10
12 ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar* OR smok* OR tobacco).ti,ab
13 ("give up" OR "gives up" OR "giving up").ti,ab
14 12 AND 13
15 1 OR 2 OR 3 OR 4
16 5 OR 6 OR 7 OR 8 OR 11 OR 14
18 SMOKING/PC [PC=Prevention And Control]
19 SMOKING CESSATION/ OR SMOKING CESSATION PROGRAMS/
20 16 OR 18 OR 19
21 SOCIAL WORK, PSYCHIATRIC/ OR EMERGENCY SERVICES, PSYCHIATRIC/ OR COMMUNITY MENTAL HEALTH SERVICES/ OR MENTAL HEALTH SERVICES/
22 MENTAL HEALTH/ OR HOSPITALS, PSYCHIATRIC/ OR COMMUNITY MENTAL HEALTH NURSING/
23 exp MENTAL HEALTH PERSONNEL/ OR exp PSYCHIATRISTS/
24 exp COMMUNITY MENTAL HEALTH SERVICES/ OR exp SOCIAL WORK, PSYCHIATRIC/ OR exp EMERGENCY SERVICES, PSYCHIATRIC/
25 MENTALLY ILL OFFENDERS/ OR MENTAL DISORDERS, CHRONIC/
26 HOSPITALS, PSYCHIATRIC/ OR PSYCHIATRIC EMERGENCIES/ OR PSYCHIATRIC UNITS/ OR PSYCHIATRIC TECHNICIANS/ OR exp PSYCHIATRIC PATIENTS/
27 MENTAL DISORDERS/ OR exp ADJUSTMENT DISORDERS/ OR exp MENTAL DISORDERS DIAGNOSED IN CHILDHOOD/ OR exp NEUROTIC DISORDERS/ OR exp ORGANIC MENTAL DISORDERS/ OR exp PERSONALITY DISORDERS/ OR exp PSYCHOPHYSIOLOGIC DISORDERS/ OR exp PSYCHOTIC DISORDERS/ OR exp PREGNANCY COMPLICATIONS, PSYCHIATRIC/
29 ALZHEIMER'S DISEASE/
31 exp DYSLEXIA/
32 exp DEVELOPMENTAL DISABILITIES/
33 AUTISTIC DISORDER/
34 NEUROBEHAVIORAL MANIFESTATIONS/ OR exp CONFUSION/ OR exp CATATONIA/ OR exp COMMUNICATIVE DISORDERS/
35 CONSCIOUSNESS DISORDERS/ OR exp MEMORY DISORDERS/ OR exp PERCEPTUAL DISORDERS/ OR exp PSYCHOMOTOR DISORDERS
37 exp FACTITIOUS DISORDERS/ OR exp MUNCHAUSEN SYNDROME/ OR exp SOMATOFORM DISORDERS/ OR exp NEUROTIC DISORDERS/ OR exp AFFECTIVE DISORDERS/ OR exp ANXIETY DISORDERS/ OR exp DISSOCIATIVE DISORDERS/
38 RETT SYNDROME/
39 ATTENTION DEFICIT HYPERACTIVITY DISORDER/
40 BULIMIA/ OR BULIMIA NERVOSA/ OR exp FEEDING AND EATING DISORDERS OF CHILDHOOD/ OR exp EATING DISORDERS/

42 exp CHILD DEVELOPMENT DISORDERS, PERVASIVE/ OR exp COMMUNICATIVE DISORDERS/ OR exp MOTOR SKILLS DISORDERS/ OR exp REACTIVE ATTACHMENT DISORDER/ OR exp SEPARATION ANXIETY/ OR exp DEVELOPMENTAL DISABILITIES/ OR exp ATTENTION DEFICIT HYPERACTIVITY DISORDER/ OR exp MENTAL DISORDERS DIAGNOSED IN CHILDHOOD/
43 IMPULSE CONTROL DISORDERS/
44 ASTHENIA/
45 exp DYSKINESIAS/
46 exp STRESS DISORDERS, POST-TRAUMATIC/
47 HALLUCINATIONS/ OR exp PSYCHOTIC DISORDERS/
48 PANIC DISORDER/
49 REHABILITATION CENTERS/
50 21 OR 22 OR 23 OR 24 OR 25 OR 26 OR 27 OR 29 OR 31 OR 32 OR 33 OR 34 OR 35 OR 37 OR 38 OR 39 OR 40 OR 42 OR 43 OR 44 OR 45 OR 46 OR 47 OR 48 OR 49
51 15 OR 50
52 20 AND 51
60 exp SUICIDE/ OR exp DELIRIUM, DEMENTIA, AMNESTIC, COGNITIVE DISORDERS/ OR exp HYSTERIA/ OR exp PSYCHOMOTOR DISORDERS/ 50654
61 exp SOCIAL BEHAVIOR DISORDERS/
62 SOCIAL ANXIETY DISORDERS/
63 50 OR 60 OR 61 OR 62
64 51 OR 63
65 64 AND 20 [Limit to: Publication Year 1985-2012]

Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, Database of Abstracts of Reviews of Effectiveness, Health Technology Assessment databases

Database host: Cochrane Library
Search date: 30/1/2012
Number of records: 1009, of which:

- Cochrane Central Register of Controlled Trials, n=938,
- Cochrane Database of Systematic Reviews, n=32
- Database of Abstracts of Reviews of Effectiveness, n=15
- Health Technology Assessment database, n=3

Search strategy:
#1 "hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars:ti,ab,kw
#2 (fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*):ti,ab,kw
#3 (#1 AND #2)
#4 (tobacco NEXT control) OR (smoking NEXT control) OR (smoking NEAR/3 services) OR (smoking NEAR/3 service) OR (anti NEXT smoking) OR (anti NEXT tobacco) OR (control NEXT tobacco) OR (control NEXT smoking) OR (smoking NEXT anti) OR (tobacco NEXT anti):ti,ab,kw
#5 "temporary abstinence" OR (temporar* NEXT abstain*) OR (abstain* NEXT temporar*):ti,ab,kw
#6 (controlled NEXT smoking):ti,ab,kw
#7 ((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) NEAR/2 (smok* OR tobacco OR cigarette*)) :ti,ab,kw
#8 MeSH descriptor Smoking, this term only
#9 MeSH descriptor Tobacco Use Cessation explode all trees
#10 MeSH descriptor Smoking Cessation explode all trees
#11 (#3 OR #4 OR #5 OR #6 OR #7 OR #8 OR #9 OR #10)
#12 (anankastic NEXT personalit*) OR "anorexia nervosa" OR (antisocial NEXT personalit*) OR ("attention deficit" NEXT disorder) OR "body dysmorphic" OR "conduct disorder" OR (cyclothymic NEXT personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems" OR "mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective NEXT disorder) :ti,ab,kw
#13 ((avoidant NEXT personalit*) OR (behavio* problem) OR (behavio* NEXT disorder*) OR (conversion NEXT disorder) OR (eating NEXT behavio*) OR (eating NEXT disorder) OR (overactive NEXT disorder) OR (personality NEAR/3 disorder*) OR agoraphobia OR Alzheimer* OR (person* NEXT anankastic) OR (anankastic NEXT person*) OR (person* NEXT antisocial) OR (antisocial NEXT person*) OR anxiety OR anxious OR (asocial NEXT person*) OR (person* NEXT asocial) OR Asperger* OR autism OR autistic OR (avoidant NEXT person*) OR (person* NEXT avoidant) OR bipolar* OR borderline NEXT personalit* OR bulimia OR catatonia OR catatonic OR compulsion* OR (person* NEXT compulsive) OR (compulsive NEXT person*) OR (conversion NEXT disorder*) OR cyclothymia OR delusion* OR (personalit* NEXT dependent) OR (dependent NEXT personalit*) OR depersonalization OR depersonalisation OR depression* OR depressive OR derealisation OR derealization OR disintegrative OR (person* NEXT dissocial) OR (dissocial NEXT person*) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR

(person* NEXT histrionic) OR (histrionic NEXT person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic NEXT person*) OR (person* NEXT narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* NEXT obsessive) OR (obsessive NEXT person*) OR oligophreni* OR paranoia OR paranoid OR (person* NEXT passive-aggressive) OR (passive-aggressive NEXT person*) OR phobia* OR phobic):ti,ab,kw
#14 (posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR rett NEAR/2 s OR retts OR schiz* OR sociopath* OR somatization OR somatisation OR somatoform):ti,ab,kw
#15 (secure unit*) OR (secure hospital*):ti,ab,kw
#16 (amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood NEAR/2 disorder) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance NEXT disorder) OR (possession NEXT disorder) OR obsessional OR "severe stress" OR (adjustment NEXT disorder) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological NEXT disturbance) OR (psychologically NEXT disturbed) OR suicid* OR parasuicid* OR (self NEXT harm*) OR (self NEXT injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders") :ti,ab,kw
#17 "mental health" OR "mental healthcare":ti,ab,kw
#18 MeSH descriptor Mental Health Services, this term only
#19 MeSH descriptor Community Mental Health Services, this term only
#20 MeSH descriptor Emergency Services, Psychiatric, this term only
#21 MeSH descriptor Social Work, Psychiatric explode all trees
#22 MeSH descriptor Mentally Ill Persons, this term only
#23 MeSH descriptor Psychiatric Department, Hospital, this term only
#24 MeSH descriptor Hospitals, Psychiatric, this term only
#25 MeSH descriptor Psychiatric Nursing, this term only
#26 MeSH descriptor Mental Health, this term only
#27 MeSH descriptor Rehabilitation Centers, this term only
#28 MeSH descriptor Adjustment Disorders, this term only
#29 MeSH descriptor Amnesia explode all trees
#30 MeSH descriptor Attention Deficit and Disruptive Behavior Disorders explode all trees
#31 MeSH descriptor Binge-Eating Disorder, this term only
#32 MeSH descriptor Capgras Syndrome, this term only
#33 MeSH descriptor Child Development Disorders, Pervasive explode all trees
#34 MeSH descriptor Cognition Disorders explode all trees
#35 MeSH descriptor Communication Disorders explode all trees
#36 MeSH descriptor Coprophagia explode all trees
#37 MeSH descriptor Delirium explode all trees
#38 MeSH descriptor Dementia explode all trees
#39 MeSH descriptor Depressive Disorder explode all trees
#40 MeSH descriptor Developmental Disabilities, this term only
#41 MeSH descriptor Dyslexia, Acquired explode all trees
#42 MeSH descriptor Factitious Disorders, this term only
#43 MeSH descriptor Feeding and Eating Disorders of Childhood explode all trees
#44 MeSH descriptor Impulse Control Disorders, this term only
#45 MeSH descriptor Mental Disorders Diagnosed in Childhood, this term only
#46 MeSH descriptor Motor Skills Disorders, this term only
#47 MeSH descriptor Munchausen Syndrome, this term only
#48 MeSH descriptor Neurocirculatory Asthenia, this term only
#49 MeSH descriptor Obsessive-Compulsive Disorder explode all trees
#50 MeSH descriptor Pica explode all trees

#51 MeSH descriptor Psychotic Disorders explode all trees
#52 MeSH descriptor Schizophrenia and Disorders with Psychotic Features, this term only
#53 MeSH descriptor Schizophrenia explode all trees
#54 MeSH descriptor Stereotypic Movement Disorder, this term only
#55 MeSH descriptor Stress Disorders, Traumatic explode all trees
#56 MeSH descriptor Affective Disorders, Psychotic explode all trees
#57 MeSH descriptor Anxiety Disorders explode all trees
#58 MeSH descriptor Anorexia Nervosa, this term only
#59 MeSH descriptor Bulimia Nervosa, this term only
#60 MeSH descriptor Bulimia, this term only
#61 MeSH descriptor Anxiety, this term only
#62 MeSH descriptor Personality Disorders explode all trees
#63 MeSH descriptor Alzheimer Disease, this term only
#64 MeSH descriptor Attention Deficit Disorder with Hyperactivity explode all trees
#65 MeSH descriptor Body Dysmorphic Disorders explode all trees
#66 MeSH descriptor Catatonia, this term only
#67 MeSH descriptor Child Behavior Disorders, this term only
#68 MeSH descriptor Compulsive Behavior, this term only
#69 MeSH descriptor Cyclothymic Disorder, this term only
#70 MeSH descriptor Delirium, Dementia, Amnestic, Cognitive Disorders explode all trees
#71 MeSH descriptor Dementia explode all trees
#72 MeSH descriptor Dependency (Psychology), this term only
#73 MeSH descriptor Depersonalization, this term only
#74 MeSH descriptor Depression, this term only
#75 MeSH descriptor Depressive Disorder, Major, this term only
#76 MeSH descriptor Dysthymic Disorder, this term only
#77 MeSH descriptor Dissociative Disorders explode all trees
#78 MeSH descriptor Eating Disorders, this term only
#79 MeSH descriptor Feeding Behavior, this term only
#80 MeSH descriptor Hallucinations, this term only
#81 MeSH descriptor Hysteria, this term only
#82 MeSH descriptor Mental Disorders, this term only
#83 MeSH descriptor Mood Disorders, this term only
#84 MeSH descriptor Personality Disorders, this term only
#85 MeSH descriptor Neurotic Disorders, this term only
#86 MeSH descriptor Obsessive Behavior, this term only
#87 MeSH descriptor Obsessive-Compulsive Disorder, this term only
#88 MeSH descriptor Panic, this term only
#89 MeSH descriptor Paranoid Disorders explode all trees
#90 MeSH descriptor Psychiatry explode all trees
#91 MeSH descriptor Psychophysiologic Disorders, this term only
#92 MeSH descriptor Psychotic Disorders, this term only
#93 MeSH descriptor Rett Syndrome, this term only
#94 MeSH descriptor Schizophrenia, Childhood, this term only
#95 MeSH descriptor Shared Paranoid Disorder, this term only
#96 MeSH descriptor Social Behavior Disorders, this term only
#97 MeSH descriptor Somatoform Disorders, this term only
#98 (#12 OR #13 OR #14 OR #15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26 OR #27 OR #28 OR #29 OR

#30 OR #31 OR #32 OR #33 OR #34 OR #35 OR #36 OR #37 OR #38 OR #39 OR #40 OR #41 OR #42 OR #43 OR #44 OR #45 OR #46 OR #47 OR #48 OR

#49 OR #50 OR #51 OR #52 OR #53 OR #54 OR #55 OR #56 OR #57 OR #58 OR #59 OR #60 OR #61 OR #62 OR #63 OR #64 OR #65 OR #66 OR #67 OR

#68 OR #69 OR #70 OR #71 OR #72 OR #73 OR #74 OR #75 OR #76 OR #77 OR #78 OR #79 OR #80 OR #81 OR #82 OR #83 OR #84 OR #85 OR #86 OR

#87 OR #88 OR #89 OR #90 OR #91 OR #92 OR #93 OR #94 OR #95 OR #96 OR #97)
#99 (#11 AND #98)
#100 (#99), from 1985 to 2012

Conference Papers Index

Database host: CSA Illumina
Database coverage dates: 1982-current
Search date: 31/1/2012
Number of records: 83
Date limits: 2008-2012

Database: Conference Papers Index
Query: (((TI=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems") OR AB=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")) or(TI=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*) OR AB=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally

labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*)) or(TI=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare") OR AB=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare")) or(TI=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)) OR AB=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)))) OR (KW=(psychosis or depression) or DE=(anxiety or (mental disorders) or schizophrenia or bipolar or depression))) AND ((DE=smoking or "tobacco smoking" OR "cigarettes" OR "cigarette smoking") OR (((TI=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)

OR AB=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)) and(TI=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) OR AB=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*))) or(TI=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti) OR AB=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti)) or(TI=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*) OR AB=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*)) or(TI=("controlled smoking") OR AB=("controlled smoking")) or(TI=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*))) or(AB=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*)))))

Database of Promoting Health Effectiveness Reviews (DoPHER) and Trials Register of Promoting Health Interventions (TRoPHI)

Search date: 3/2/2012
Number of records: (59 DoPHER, 89 TRoPHI)

Search strategy:

1 Focus of the report: mental health
2 Focus of the report: eating disorder
3 Focus of the report: Suicide
4 Freetext (item record) "mental health*"
5 Freetext (item record) "psychiatr*"
6 Freetext (item record) "depressi*"
7 Freetext (item record) "disorder*"
8 Freetext (item record) "personalit*"
9 Freetext (item record) "schizo*"
10 Freetext (item record) "suicid*"
11 Freetext (item record) "comorbid*"
12 Freetext (item record) "mental*"
13 Freetext (item record) "anorex*"
14 Freetext (item record) "bulimi*"
15 Freetext (item record) "obessive*"
16 Freetext (item record) "compulsiv*"
17 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8 OR 9 OR 10 OR 12 OR 13 OR 14 OR 15 OR 16
18 Focus of the report: tobacco
19 Freetext (item record) "tobacco*"
20 Freetext (item record) "smoking"
21 Freetext (item record) "cigar*"
22 18 OR 19 OR 20 OR 21
23 17 AND 22

EMBASE

Database host: OVID
Database coverage dates: 1980-current
Search date: 9/2/2012
Number of records: 5989
Date limits: 1985-2012

2 (((histrionic ADJ1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic ADJ1 person*) OR (person* ADJ1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* ADJ1 obsessive) OR (obsessive ADJ1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* ADJ1 passive-aggressive) OR (passive-aggressive ADJ1 person*) OR phobia$ OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR (rett ADJ2 s) OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure ADJ1 unit$) OR (secure ADJ1 hospital$) OR amnesi* OR hypomania OR cyclothymia OR dysthymia OR dementia OR delirium OR hallucinosis OR delusional OR (mood ADJ2 disorder$) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance ADJ1 disorder$) OR (possession ADJ1 disorder$) OR obsessional OR "severe stress" OR (adjustment ADJ1 disorder$) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological ADJ1 disturbance$) OR (psychologically ADJ1 disturbed) OR suicid* OR parasuicid*)).ti,ab 756398
3 (((self ADJ1 harm*) OR (self ADJ1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder$" OR "mental health" OR "mental healthcare")).ti,ab 286348
4 (((anankastic ADJ personalit*) OR "anorexia nervosa" OR (antisocial ADJ personalit*) OR ("attention deficit" ADJ disorder$) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic ADJ personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")).ti,ab 57941
5 ("temporary abstinence" OR (temporar* ADJ1 abstain*) OR (abstain* ADJ1 temporar*) OR (controlled ADJ1 smoking)).ti,ab 139
6 ((fading ADJ2 smok*) OR (temporary ADJ2 smok*) OR (cessat* ADJ2 smok*) OR (withdraw* ADJ2 smok*) OR (ceas* ADJ2 smok*) OR (stop* ADJ2 smok*) OR (schedul* ADJ2 smok*) OR (quit ADJ2 smok*) OR (quits ADJ2 smok*) OR (quitt* ADJ2 smok*) OR (reduc* ADJ2 smok*) OR (abstain* ADJ2 smok*) OR (prevent* ADJ2 smok*) OR (abstinence ADJ2 smok*) OR (restrict* ADJ2 smok*)).ti,ab 26275
7 ((fading ADJ2 tobacco) OR (temporary ADJ2 tobacco) OR (cessat* ADJ2 tobacco) OR (withdraw* ADJ2 tobacco) OR (ceas* ADJ2 tobacco) OR (stop* ADJ2 tobacco) OR (schedul* ADJ2 tobacco) OR (quit ADJ2 tobacco) OR (quits ADJ2 tobacco) OR (quitt* ADJ2 tobacco) OR (reduc* ADJ2 tobacco) OR (abstain* ADJ2 tobacco) OR (prevent* ADJ2 tobacco) OR (abstinence ADJ2 tobacco) OR (restrict* ADJ2 tobacco)).ti,ab 3874
8 ((fading ADJ2 cigarette$) OR (temporary ADJ2 cigarette$) OR (cessat* ADJ2 cigarette$) OR (withdraw* ADJ2 cigarette$) OR (ceas* ADJ2 cigarette$) OR (stop* ADJ2 cigarette$) OR (schedul* ADJ2 cigarette$) OR (quit ADJ2 cigarette$) OR (quits ADJ2 cigarette$) OR (quitt* ADJ2 cigarette$) OR (reduc* ADJ2 cigarette$) OR (abstain* ADJ2 cigarette$) OR (prevent* ADJ2 cigarette$) OR (abstinence ADJ2 cigarette$) OR (restrict* ADJ2 cigarette$)).ti,ab 1828
9 (fading OR temporary OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit$ OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*).ti,ab 3423659
10 ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars).ti,ab 3349
11 9 AND 10 966

12 ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar* OR smok* OR tobacco).ti,ab 223256
13 ("give up" OR "gives up" OR "giving up").ti,ab 2603
14 12 AND 13 743
15 SMOKING CESSATION/ OR SMOKING CESSATION PROGRAM/ 30596
16 SMOKING/pc 6748
17 TOBACCO DEPENDENCE/pc [pc=Prevention] 1105
18 PSYCHOGERIATRIC NURSING/ OR COMMUNITY PSYCHIATRIC NURSING/ OR PSYCHIATRIC NURSING/ 13716
19 PSYCHIATRIC DEPARTMENT/ OR PSYCHIATRIC DEPARTMENT, HOSPITAL/ 5358
20 MENTAL HEALTH CARE/ OR MENTAL HEALTH SERVICE/ OR exp MENTAL HOSPITAL [+NT]/ OR exp PSYCHIATRIC NURSING [+NT]/ 82551
21 COMMUNITY MENTAL HEALTH/ OR MENTAL HEALTH/ 56365
22 SUICIDE/ 35148
23 DISORDERS OF HIGHER CEREBRAL FUNCTION/ OR ALIEN HAND SYNDROME/ OR APRAXIA/ OR ATTENTION DISTURBANCE/ OR CATALEPSY/ OR COGNITIVE DEFECT/ OR DEVELOPMENTAL COORDINATION DISORDER/ OR DISORIENTATION/ OR DYSPRAXIA/ OR MILD COGNITIVE IMPAIRMENT/ OR exp AGNOSIA [+NT]/ OR exp CONFUSION [+NT]/ OR exp DELIRIUM [+NT]/ OR exp EMOTIONAL INCONTINENCE [+NT]/ OR exp MEMORY DISORDER [+NT]/ 145045
24 exp SOCIAL PHOBIA/ OR exp ANXIETY/ OR exp ANXIETY NEUROSIS/ 101762
25 HYSTERIA/ 5169
26 DAY HOSPITAL/ OR HALFWAY HOUSE/ OR MENTAL HOSPITAL/ OR MENTAL HEALTH CARE/ 39103
27 POSTTRAUMATIC STRESS DISORDER/ OR exp ANXIETY DISORDER/ 116510
28 PSYCHOSOMATIC DISORDER/ OR exp SOMATOFORM DISORDER/ OR exp BODY DYSMORPHIC DISORDER/ OR exp CARDIAC ANXIETY/ OR exp CONVERSION DISORDER/ OR exp DELUSIONAL PARASITOSIS/ OR exp DELUSIONAL PREGNANCY/ OR exp MASKED DEPRESSION/ OR exp PSYCHOGENIC PAIN/ OR exp SOMATIC DELUSION/ OR exp SOMATIZATION/ 27684
29 exp PARANOIA/ OR exp DELUSION/ OR exp PARANOID PSYCHOSIS/ 21153
30 exp SCHIZOPHRENIA/ OR exp SCHIZOAFFECTIVE PSYCHOSIS/ OR exp OBSESSIVE COMPULSIVE DISORDER/ OR exp PSYCHOSIS/ OR exp SCHIZOIDISM/ OR exp BIPOLAR DISORDER/ OR exp OBSESSION/ 218394
31 exp RETT SYNDROME/ OR exp AUTISM/ OR exp DEMENTIA/ 204375
32 HYPERVENTILATION SYNDROME/ OR PSYCHOSOCIAL WITHDRAWAL/ OR PSYCHOSOMATIC DISORDER/ OR exp FACTITIOUS DISEASE [+NT]/ 18894
33 MENTAL STRESS/ 49283
34 NEURASTHENIA/ 1486
35 exp PERSONALITY DISORDER/ 39808
36 exp NARCISSISM/ OR exp DEPRESSION/ 259332
37 exp DISSOCIATIVE FUGUE/ OR exp DISSOCIATIVE DISORDER/ OR exp DISSOCIATIVE AMNESIA/ 5118
38 exp DEPERSONALIZATION/ 2143
39 exp PSYCHIATRY/ 85817
40 exp DELUSION/ 16488
41 exp CYCLOTHYMIA/ OR exp BIPOLAR DISORDER/ OR exp DYSTHYMIA/ OR exp BIPOLAR II DISORDER/ OR exp MAJOR DEPRESSION/ 60125
42 exp CATATONIA/ 2732
43 exp EATING DISORDER/ OR exp APPETITE DISORDER/ OR exp BULIMIA/ 66605
44 exp ATTENTION DEFICIT DISORDER/ 28466
45 exp ALZHEIMER DISEASE/ 98856

46 REHABILITATION CENTER/ 7356
47 COORDINATION DISORDER/ OR DEVELOPMENTAL COORDINATION DISORDER/ 1264
48 exp ASTHENIA/ 15057
49 exp MUNCHAUSEN SYNDROME/ 1618
50 exp PSYCHOMOTOR DISORDER/ 41977
51 exp DEVELOPMENTAL DISORDER/ 21356
52 IMPULSE CONTROL DISORDER/ 1515
53 exp COMMUNICATION DISORDER/ 39414
54 exp COGNITIVE DEFECT/ 72350
57 5 OR 6 OR 7 OR 8 OR 11 OR 14 OR 15 OR 16 OR 17 46755
59 exp ANIMALS/ 1668187
60 NONHUMAN/ 3785601
61 EXP HUMAN/ 12891299
65 ("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective ADJ1 disorder$) OR (avoidant ADJ1 personalit*) OR (behavio* ADJ1 problem$) OR (behavio* ADJ1 disorder$) OR (conversion ADJ1 disorder$) OR (eating ADJ1 behavio*) OR (eating ADJ1 disorder$) OR (overactive ADJ1 disorder$) OR (personality ADJ3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic ADJ1 person*) OR (antisocial ADJ1 person*) OR anxiety OR anxious OR (person* ADJ1 asocial) OR Asperger* OR autism OR autistic OR (person* ADJ1 avoidant) OR bipolar* OR (borderline ADJ1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive ADJ1 person*) OR (conversion ADJ1 disorder$) OR cyclothymia OR delusion* OR (dependent ADJ1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* ADJ1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* ADJ1 histrionic)).ti,ab [Limit to: Publication Year 1990-2012] 523278
70 CONDUCT DISORDER/ OR PSYCHOSOCIAL DISORDER/ 6975
73 exp SUICIDAL BEHAVIOR/ 57025
79 (MENTAL OVERSTIMULATION/ OR ORGANIC BRAIN SYNDROME/ OR ORGANIC PSYCHOSYNDROME/) AND 57 2
125 MOOD DISORDER/ OR AFFECTIVE NEUROSIS/ OR AFFECTIVE PSYCHOSIS/ OR BLUNTED AFFECT/ OR MAJOR AFFECTIVE DISORDER/ OR MINOR AFFECTIVE DISORDER/ OR SCHIZOAFFECTIVE PSYCHOSIS/ OR exp MANIA [+NT]/ 71967
126 MENTAL DISEASE/ OR ADJUSTMENT DISORDER/ OR ALEXITHYMIA/ OR EMOTIONAL DISORDER/ OR MENTAL INSTABILITY/ OR MENTAL OVERSTIMULATION/ OR ORGANIC BRAIN SYNDROME/ OR ORGANIC PSYCHOSYNDROME/ OR PSYCHOTRAUMA/ OR exp ANXIETY DISORDER [+NT]/ OR exp AUTISM [+NT]/ OR exp CONFUSION [+NT]/ OR exp DELIRIUM [+NT]/ OR exp DEMENTIA [+NT]/ OR exp DISSOCIATIVE DISORDER [+NT]/ OR exp LEARNING DISORDER [+NT]/ OR exp MEMORY DISORDER [+NT]/ OR exp NEUROSIS [+NT]/ OR exp PERSONALITY DISORDER [+NT]/ OR exp PSYCHOSIS [+NT]/ OR exp THOUGHT DISORDER [+NT]/ 726684
131 DEPRESSION/co,cn,di,dr,dt,ep,et,rt,si,su,th [co=Complication, cn=Congenital Disorder, di=Diagnosis, dr=Drug Resistance, dt=Drug Therapy, ep=Epidemiology, et=Etiology, rt=Radiotherapy, si=Side Effect, su=Surgery, th=Therapy] 101002
139 ABNORMAL BEHAVIOR/ OR BEHAVIOR DISORDER/ OR ATTENTION DEFICIT DISORDER/ OR AUTOMUTILATION/ OR CONGENITAL BEHAVIOR DISORDER/ OR COPROPHAGY/ OR DISRUPTIVE BEHAVIOR/ OR IMPULSE CONTROL DISORDER/ OR OPPOSITIONAL DEFIANT DISORDER/ OR exp EATING DISORDER [+NT]/ OR exp PERCEPTION DISORDER [+NT]/ OR exp PSYCHOMOTOR DISORDER [+NT]/ OR PSYCHOSOCIAL DISORDER/ OR exp SOCIOPATHY [+NT]/ OR exp SUICIDAL BEHAVIOR [+NT]/ 311562
140 36 not 131 158330
141 exp NARCISSISM/ 4049

144 ("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective ADJ1 disorder$) OR (avoidant ADJ1 personalit*) OR (behavio* ADJ1 problem$) OR (behavio* ADJ1 disorder$) OR (conversion ADJ1 disorder$) OR (eating ADJ1 behavio*) OR (eating ADJ1 disorder$) OR (overactive ADJ1 disorder$) OR (personality ADJ3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic ADJ1 person*) OR (antisocial ADJ1 person*) OR anxiety OR anxious OR (person* ADJ1 asocial) OR Asperger* OR autism OR autistic OR (person* ADJ1 avoidant) OR bipolar* OR (borderline ADJ1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive ADJ1 person*) OR (conversion ADJ1 disorder$) OR cyclothymia OR delusion* OR (dependent ADJ1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* ADJ1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* ADJ1 histrionic)).ti,ab 629953
145 2 OR 3 OR 4 OR 18 OR 19 OR 20 OR 21 OR 22 OR 23 OR 24 OR 25 OR 26 OR 27 OR 28 OR 29 OR 30 OR 31 OR 32 OR 33 OR 34 OR 35 OR 37 OR 38 OR 39 OR 40 OR 41 OR 42 OR 43 OR 44 OR 45 OR 46 OR 47 OR 48 OR 49 OR 50 OR 51 OR 52 OR 53 OR 54 OR 70 OR 73 OR 79 OR 125 OR 126 OR 139 OR 140 OR 141 OR 144 1917356
146 145 AND 57 6234
147 59 OR 60 5437441
148 147 AND 61 1100352
149 147 NOT 148 4337089
150 146 NOT 149 6099
151 150 [Limit to: Publication Year 1985-2012] 5972

HEALTH EVIDENCE CANADA

Search date: 8/2/2012
Number of records: 42 items

Searched on pre-defined categories:
(Tobacco OR Smoking Cessation) AND (Community health centre OR Correctional institution OR Day care centre OR Health departments OR Hospice OR Hospital OR Nursing home/long-term care facility OR Residential centre)
Scanned records on title, and saved 42 records.

HMIC

Database host: OVID
Search date: 6/2/2012
Number of records: 250
Date limits: 1985-2012

1. (("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective ADJ1 disorder$) OR (avoidant ADJ1 personalit*) OR (behavio* problem$) OR (behavio* ADJ1 disorder$) OR (conversion ADJ1 disorder$) OR (eating ADJ1 behavio*) OR (eating ADJ1 disorder$) OR (overactive ADJ1 disorder$) OR (personality ADJ3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic ADJ1 person*) OR (antisocial ADJ1 person*) OR anxiety OR anxious OR (person* ADJ1 asocial) OR Asperger* OR autism OR autistic OR (person* ADJ1 avoidant) OR bipolar* OR (borderline ADJ1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive ADJ1 person*) OR (conversion ADJ1 disorder$) OR cyclothymia OR delusion* OR (dependent ADJ1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* ADJ1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* ADJ1 histrionic))).ti,ab; 10775 results.
2. (((histrionic ADJ1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic ADJ1 person*) OR (person* ADJ1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* ADJ1 obsessive) OR (obsessive ADJ1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* ADJ1 passive-aggressive) OR (passive-aggressive ADJ1 person*) OR phobia$ OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR (rett ADJ2 s) OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure ADJ1 unit$) OR (secure ADJ1 hospital$) OR amnesi* OR hypomania OR cyclothymia OR dysthymia OR dementia OR delirium OR hallucinosis OR delusional OR (mood ADJ2 disorder$) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance ADJ1 disorder$) OR (possession ADJ1 disorder$) OR obsessional OR "severe stress" OR (adjustment ADJ1 disorder$) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological ADJ1 disturbance$) OR (psychologically ADJ1 disturbed) OR suicid* OR parasuicid*)).ti,ab; 14797 results.
3. (((self ADJ1 harm*) OR (self ADJ1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder$" OR "mental health" OR "mental healthcare")).ti,ab; 16420 results.
4. (((anankastic ADJ personalit*) OR "anorexia nervosa" OR (antisocial ADJ personalit*) OR ("attention deficit" ADJ disorder$) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic ADJ personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")).ti,ab; 3718 results.
5. ("temporary abstinence" OR (temporar* ADJ1 abstain*) OR (abstain* ADJ1 temporar*) OR (controlled ADJ1 smoking)).ti,ab; 3 results.
6. ((fading ADJ2 smok*) OR (temporary ADJ2 smok*) OR (cessat* ADJ2 smok*) OR (withdraw* ADJ2 smok*) OR (ceas* ADJ2 smok*) OR (stop* ADJ2 smok*) OR (schedul* ADJ2 smok*) OR (quit ADJ2 smok*) OR (quits ADJ2 smok*) OR (quitt* ADJ2 smok*) OR (reduc* ADJ2 smok*) OR (abstain* ADJ2 smok*) OR (prevent* ADJ2 smok*) OR (abstinence ADJ2 smok*) OR (restrict* ADJ2 smok*)).ti,ab; 1759 results.

7. ((fading ADJ2 tobacco) OR (temporary ADJ2 tobacco) OR (cessat* ADJ2 tobacco) OR (withdraw* ADJ2 tobacco) OR (ceas* ADJ2 tobacco) OR (stop* ADJ2 tobacco) OR (schedul* ADJ2 tobacco) OR (quit ADJ2 tobacco) OR (quits ADJ2 tobacco) OR (quitt* ADJ2 tobacco) OR (reduc* ADJ2 tobacco) OR (abstain* ADJ2 tobacco) OR (prevent* ADJ2 tobacco) OR (abstinence ADJ2 tobacco) OR (restrict* ADJ2 tobacco)).ti,ab; 156 results.
8. ((fading ADJ2 cigarette$) OR (temporary ADJ2 cigarette$) OR (cessat* ADJ2 cigarette$) OR (withdraw* ADJ2 cigarette$) OR (ceas* ADJ2 cigarette$) OR (stop* ADJ2 cigarette$) OR (schedul* ADJ2 cigarette$) OR (quit ADJ2 cigarette$) OR (quits ADJ2 cigarette$) OR (quitt* ADJ2 cigarette$) OR (reduc* ADJ2 cigarette$) OR (abstain* ADJ2 cigarette$) OR (prevent* ADJ2 cigarette$) OR (abstinence ADJ2 cigarette$) OR (restrict* ADJ2 cigarette$)).ti,ab; 80 results.
9. (fading OR temporary OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit$ OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*).ti,ab; 38005 results.
10. ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars).ti,ab; 55 results.
11. 9 AND 10; 25 results.
12. ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar* OR smok* OR tobacco).ti,ab; 7327 results.
13. ("give up" OR "gives up" OR "giving up").ti,ab; 254 results.
14. 12 AND 13; 156 results.
15. SMOKING CONTROL/; 432 results.
16. SMOKING CESSATION/; 1527 results.
17. 5 OR 6 OR 7 OR 8 OR 11 OR 14 OR 15 OR 16; 2600 results.
18. exp MENTAL ILLNESS/; 6061 results.
19. MENTAL HEALTH OFFICERS/ OR MENTAL HEALTH SERVICES/ OR PSYCHIATRY/ OR ORTHOPSYCHIATRY/; 7464 results.
20. exp PSYCHIATRY/ OR exp PSYCHIATRIC TREATMENT/ OR exp PSYCHIATRISTS/ OR exp ORTHOPSYCHIATRY/ OR exp MENTAL HEALTH CARE/ OR exp MENTAL HEALTH/ OR exp MENTAL DISORDERS/; 27130 results.
21. exp MENTAL HEALTH CARE/ OR exp MENTAL HEALTH SERVICES/ OR exp MENTAL HEALTH UNITS/ OR exp PSYCHIATRIC PRISONS/ OR exp MENTAL HEALTH NURSING HOMES/ OR exp MENTAL HEALTH HOSPITALS/; 13660 results.
22. exp MENTAL HEALTH SOCIAL WORK/; 560 results.
23. exp MENTAL HEALTH UNITS/ OR exp PSYCHIATRIC EMERGENCY SERVICES/ OR exp PSYCHIATRIC TREATMENT/ OR exp MENTAL HEALTH DAY CENTRES/ OR exp MENTAL HEALTH HOSPITALS/ OR exp MENTAL HEALTH CARE/; 6388 results.
24. 1 OR 2 OR 3 OR 4 OR 18 OR 19 OR 20 OR 21 OR 22 OR 23 ; 44219 results.
25. SMOKING TREATMENT/; 99 results.
26. 17 OR 25; 2608 results.
27. 24 AND 26; 257 results.
28. 27 [Limit to: Publication Year 1985-Current]; 250 results.

International Bibliography of Social Sciences

Database host: CSA Illumina
Database coverage dates: 1951-current
Search Date: 3/2/2012
Date limits: 1985-2012
Number of records: 204

Query: ((DE=("alzheimer s disease" or "anxiety" or "dementia" or "depression" or "madness" or "mental deficiencies" or "mental health" or "mental hospitals" or "mental illness" or "mental stress" or "neuroses" or "personality disorders" or "post traumatic stress disorder" or "psychiatrists" or "psychoses" or "schizophrenia")) or(TI=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems") OR AB=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems") or TI=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*) OR AB=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1

units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*)) or(TI=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare") OR AB=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare")) or(TI=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)) OR AB=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)))) and((((TI=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR

cigars) OR AB=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)) and(TI=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) OR AB=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*))) or(TI=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti) OR AB=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti)) or(TI=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*) OR AB=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*)) or(TI=("controlled smoking") OR AB=("controlled smoking")) or(TI=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*))) or(AB=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*)))) or(DE="smoking" or DE="tobacco"))

MEDLINE, INCLUDING MEDLINE IN PROCESS

Database host: EBSCO host
Date: 30 January 2011
Results: 3732

#	Query
S37	**S33 NOT S36 (3732 records)** Limiters - Date of Publication from: 19850101-20121231
S36	S35 NOT S34
S35	MH ("Animals")
S34	MH ("Humans") AND MH ("Animals")
S33	S16 AND S32
S32	S17 or S18 or S19 or S20 or S21 or S22 or S23 or S24 or S25 or S26 or S27 or S28 or S29 or S30 or S31
S31	AB ("mental health" OR "mental healthcare")
S30	TI ("mental health" OR "mental healthcare")
S29	AB (amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood W2 disorder#) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance W1 disorder#) OR (possession W1 disorder#) OR obsessional OR "severe stress" OR (adjustment W1 disorder#) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological W1 disturbance#) OR (psychologically W1 disturbed) OR suicid* OR parasuicid* OR (self W1 harm*) OR (self W1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders")
S28	TI (amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood W2 disorder#) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance W1 disorder#) OR (possession W1 disorder#) OR obsessional OR "severe stress" OR (adjustment W1 disorder#) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological W1 disturbance#) OR (psychologically W1 disturbed) OR suicid* OR parasuicid* OR (self W1 harm*) OR (self W1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders")
S27	AB ("secure unit#" OR "secure hospital#")
S26	TI ("secure unit#" OR "secure hospital#")
S25	AB ("anankastic personalit*" OR "anorexia nervosa" OR "antisocial personalit*" OR "attention deficit disorder#" OR "body dysmorphic" OR "conduct disorder" OR "cyclothymic personalit*" OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems" OR "mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR "affective disorder*" OR "avoidant personalit*" OR "behavio#r disorder*" OR "behavio#r problem*" OR "behavioral disorder#" OR "behavioural disorder#" OR "conversion disorder *" OR "eating behavio#r" OR "eating W1 disorder#" OR "overactive disorder#" OR (personality N3 disorder#) OR agoraphobia OR Alzheimer* OR (anankastic N1 person*) OR (antisocial N1 person*) OR anxiety OR anxious OR (asocial N1 person*) OR Asperger* OR autism OR autistic OR (avoidant N1 person*) OR bipolar* OR "borderline personalit*" OR bulimia OR

	catatonia OR catatonic OR compulsion* OR (compulsive N1 person*) OR (conversion W1 disorder*) OR cyclothymia OR delusion* OR (dependent N1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (dissocial N1 person*) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (histrionic N1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic N1 person*) OR neurasthenia OR neurosis OR neurot* OR (obsessive N1 person*) OR oligophreni* OR paranoia OR paranoid OR (passive-aggressive N1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR rett?s OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform)
S24	TI ("anankastic personalit*" OR "anorexia nervosa" OR "antisocial personalit*" OR "attention deficit disorder#" OR "body dysmorphic" OR "conduct disorder" OR "cyclothymic personalit*" OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems" OR "mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR "affective disorder*" OR "avoidant personalit*" OR "behavio#r disorder*" OR "behavio#r problem*" OR "behavioral disorder#" OR "behavioural disorder#" OR "conversion disorder *" OR "eating behavio#r" OR "eating W1 disorder#" OR "overactive disorder#" OR (personality N3 disorder#) OR agoraphobia OR Alzheimer* OR (anankastic N1 person*) OR (antisocial N1 person*) OR anxiety OR anxious OR (asocial N1 person*) OR Asperger* OR autism OR autistic OR (avoidant N1 person*) OR bipolar* OR "borderline personalit*" OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive N1 person*) OR (conversion W1 disorder*) OR cyclothymia OR delusion* OR (dependent N1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (dissocial N1 person*) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (histrionic N1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic N1 person*) OR neurasthenia OR neurosis OR neurot* OR (obsessive N1 person*) OR oligophreni* OR paranoia OR paranoid OR (passive-aggressive N1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR rett?s OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform)
S23	MH (("Adjustment Disorders") OR ("Amnesia+") OR ("Attention Deficit and Disruptive Behavior Disorders+") OR ("Binge-Eating Disorder") OR ("Capgras Syndrome") OR ("Child Development Disorders, Pervasive+") OR ("Cognition Disorders+") OR ("Communication Disorders+") OR ("Consciousness Disorders") OR ("Coprophagia") OR ("Delirium") OR ("Dementia+") OR ("Depressive Disorder+") OR ("Developmental Disabilities") OR ("Dyslexia, Acquired+") OR ("Factitious Disorders") OR ("Feeding and Eating Disorders of Childhood+") OR ("Impulse Control Disorders") OR ("Mental Disorders Diagnosed in Childhood") OR ("Motor Skills Disorders") OR ("Munchausen Syndrome") OR ("Neurocirculatory Asthenia") OR ("Obsessive-Compulsive Disorder+") OR ("Pica") OR ("Psychotic Disorders+") OR ("Schizophrenia and Disorders with Psychotic Features") OR ("Schizophrenia+") OR ("Stereotypic Movement Disorder") OR ("Stress Disorders, Traumatic+"))
S22	(MH "Rehabilitation Centers")
S21	(MH "mental health")
S20	(MH "Affective Disorders, Psychotic") OR (MH "Agoraphobia") OR (MH "anankastic personality disorder") OR (MH "Anorexia Nervosa") OR (MH "Antisocial Personality Disorder") OR (MH "Anxiety Disorders") OR (MH "Anxiety") OR (MH "Alzheimer

	disease") OR (MH "Attention Deficit and Disruptive Behavior Disorders") OR (MH "Attention Deficit Disorder with Hyperactivity") OR (MH "avoidant personality disorder") OR (MH "Bipolar Disorder") OR (MH "Body Dysmorphic Disorders") OR (MH "Borderline Personality Disorder") OR (MH "Bulimia Nervosa") OR (MH "Bulimia") OR (MH "Catatonia") OR (MH "Child Behavior Disorders") OR (MH "Community Mental Health Services") OR (MH "Compulsive Behavior") OR (MH "Compulsive Personality Disorder") OR (MH "Conduct Disorder") OR (MH "Conversion Disorder") OR (MH "Cyclothymic Disorder") OR (MH "Delirium, Dementia, Amnestic, Cognitive Disorders") OR (MH "Delusions") OR (MH "Dementia+") OR (MH "Dependency (Psychology)") OR (MH "Dependent Personality Disorder") OR (MH "Depersonalization") OR (MH "Depression") OR (MH "Depressive Disorder") OR (MH "Depressive Disorder, Major") OR (MH "Dissociative Disorders") OR (MH "Dysthymic Disorder") OR (MH "Eating Disorders") OR (MH "Feeding Behavior") OR (MH "Hallucinations") OR (MH "histrionic personality disorder") OR (MH "Hysteria") OR (MH "Mental Disorders") OR (MH "Mental health services") OR (MH "Mental illness") OR (MH "Mood Disorders") OR (MH "Multiple Personality Disorder") OR (MH "narcissistic personality disorder") OR (MH "Neurasthenia") OR (MH "Neurotic Disorders") OR (MH "Obsessive Behavior") OR (MH "obsessive compulsive personality disorder") OR (MH "Obsessive-Compulsive Disorder") OR (MH "Panic Disorder") OR (MH "Panic") OR (MH "Paranoid Disorders") OR (MH "Paranoid Personality Disorder") OR (MH "passive-aggressive personality disorder") OR (MH "Personality Disorders") OR (MH "Phobic Disorders") OR (MH "Psychiatry+")OR (MH "Psychophysiologic Disorders") OR (MH "Psychotic Disorders") OR (MH "Rett Syndrome") OR (MH "Schizoid Personality Disorder") OR (MH "Schizophrenia") OR (MH "Schizophrenia, Catatonic") OR (MH "Schizophrenia, Childhood") OR (MH "Schizophrenia, Disorganized") OR (MH "Schizophrenia, Paranoid") OR (MH "Schizotypal Personality Disorder") OR (MH "Shared Paranoid Disorder") OR (MH "Social Behavior Disorders") OR (MH "Somatoform Disorders") OR (MH "Stress Disorders, Post-Traumatic")
S19	(MH "Psychiatric Department, Hospital") OR (MH "Hospitals, Psychiatric") OR (MH "Psychiatric Nursing")
S18	(MH "Mentally Ill Persons")
S17	(MH "Mental Health Services") OR (MH "Community Mental Health Services") OR (MH "Emergency Services, Psychiatric") OR (MH "Social Work, Psychiatric")
S16	S1 or S2 or S3 or S8 or S9 or S10 or S11 or S12 or S13 or S14 or S15
S15	TI ((fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) N2 (smok* OR tobacco OR cigarette#))
S14	AB ((fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) N2 (smok* OR tobacco OR cigarette#))
S13	TI ("Controlled smoking") OR AB ("Controlled smoking")
S12	(S5 AND S7) OR (S6 AND S4)
S11	AB (temporary abstinence OR (temporar* N1 abstain*))
S10	TI (temporary abstinence OR (temporar* N1 abstain*))
S9	AB ((tobacco N1 control) OR (smoking N1 control) OR (smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))
S8	TI ((tobacco N1 control) OR (smoking N1 control) OR (smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))
S7	AB (fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit* OR reduc* OR abstain* OR prevent* OR

	abstinence OR restrict*)
S6	TI (fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*)
S5	AB ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)
S4	TI ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)
S3	(MH "Smoking/PC")
S2	(MH "Smoking Cessation")
S1	(MH "Tobacco Use Cessation+")

PsycINFO

Database host: EBSCO host
Database coverage dates: 1887-current
Search date: 31 January 2011
Results: 2077

#	Query
S26	**S15 AND S25 (2077 records)** Limiters - Publication Year from: 1985-2012; Population Group: Human
S25	S16 or S17 or S18 or S19 or S20 or S21 or S22 or S23 or S24
S24	DE "Acrophobia" OR DE "Acute Psychosis" OR DE "Acute Stress Disorder" OR DE "Adjustment Disorders" OR DE "Adolescent Psychiatry" OR DE "Affective Disorders" OR DE "Affective Psychosis" OR DE "Agoraphobia" OR DE "AIDS Dementia Complex" OR DE "Alcoholic Hallucinosis" OR DE "Alcoholic Psychosis" OR DE "Alexithymia" OR DE "Alzheimer's Disease" OR DE "Amnesia" OR DE "Anencephaly" OR DE "Anorexia Nervosa" OR DE "Anterograde Amnesia" OR DE "Antisocial Personality Disorder" OR DE "Anxiety Disorders" OR DE "Anxiety" OR DE "Aphasia" OR DE "Aspergers Syndrome" OR DE "Athetosis" OR DE "Attempted Suicide" OR DE "Attention Deficit Disorder with Hyperactivity" OR DE "Attention Deficit Disorder" OR DE "Auditory Hallucinations" OR DE "Autism" OR DE "Autistic Thinking" OR DE "Avoidant Personality Disorder" OR DE "Balint's Syndrome" OR DE "Behavior Disorders" OR DE "Binge Eating Disorder" OR DE "Biological Psychiatry" OR DE "Bipolar Disorder" OR DE "Bipolar Disorder" OR DE "Body Dysmorphic Disorder" OR DE "Body Image Disturbances" OR DE "Borderline Personality Disorder" OR DE "Borderline States" OR DE "Brain Damage" OR DE "Brain Disorders" OR DE "Brain Neoplasms" OR DE "Bufotenine" OR DE "Bulimia" OR DE "Capgras Syndrome" OR DE "Castration Anxiety" OR DE "Catatonia" OR DE "Catatonic Schizophrenia" OR DE "Cerebral Palsy" OR DE "Cerebrovascular Accidents" OR DE "Child Psychiatry" OR DE "Childhood Neurosis" OR DE "Childhood Psychosis" OR DE "Chronic Alcoholic Intoxication" OR DE "Chronic Mental Illness" OR DE "Chronic Psychosis" OR DE "Claustrophobia" OR DE "Clinical Psychologists" OR DE "Cognitive Impairment" OR DE "Commitment (Psychiatric)" OR DE "Community Mental Health Centers" OR DE "Community Mental Health Services" OR DE "Community Mental Health" OR DE "Community Psychiatry" OR DE "Conduct Disorder" OR DE "Confabulation" OR DE "Consciousness Disturbances" OR DE "Consultation Liaison Psychiatry" OR DE "Conversion Disorder" OR DE "Coprophagia" OR DE "Crisis Intervention Services" OR DE "Cyclothymic Personality" OR DE "Death Anxiety" OR DE "Deinstitutionalization" OR DE "Delirium Tremens" OR DE "Delirium" OR DE "Delusions" OR DE "Dementia with Lewy Bodies" OR DE "Dementia" OR DE "Dependent Personality Disorder" OR DE "Depersonalization" OR DE "Developmental Disabilities" OR DE "Diaschisis" OR DE "Dissociation" OR DE "Dissociative Disorders" OR DE "Dissociative Identity Disorder" OR DE "Dysexecutive Syndrome" OR DE "Dyspraxia" OR DE "Dysthymic Disorder" OR DE "Eating Disorders" OR DE "Elective Mutism" OR DE "Encephalitis" OR DE "Encephalopathies" OR DE "Epilepsy" OR DE "Epileptic Seizures" OR DE "Experimental Neurosis" OR DE "Experimental Psychosis" OR DE "Factitious Disorders" OR DE "Fantasies (Thought Disturbances)" OR DE "Folie A Deux" OR DE "Forensic Psychiatry" OR DE "Fragmentation (Schizophrenia)" OR DE "Fugue Reaction" OR DE "General Paresis" OR DE "Generalized Anxiety Disorder" OR DE

	"Geriatric Psychiatry" OR DE "Global Amnesia" OR DE "Hallucinations" OR DE "Hallucinosis" OR DE "Histrionic Personality Disorder" OR DE "Hydrocephalus" OR DE "Hyperkinesis" OR DE "Hyperphagia" OR DE "Hypnagogic Hallucinations" OR DE "Hypochondriasis" OR DE "Hypomania" OR DE "Hysteria" OR DE "Hysteria" OR DE "Hysterical Paralysis" OR DE "Hysterical Vision Disturbances" OR DE "Impulse Control Disorders" OR DE "Institutional Release" OR DE "Intracranial Abscesses" OR DE "Judgment Disturbances" OR DE "Kleine Levin Syndrome" OR DE "Kluver Bucy Syndrome" OR DE "Koro" OR DE "Korsakoffs Psychosis" OR DE "Leukoencephalopathy" OR DE "Lysergic Acid Diethylamide" OR DE "Magical Thinking" OR DE "Major Depression" OR DE "Mania" OR DE "Memory Disorders" OR DE "Mental Disorders" OR DE "Mental Health Personnel" OR DE "Mental Health Programs" OR DE "Mental Health Services" OR DE "Mental Health" OR DE "Microcephaly" OR DE "Munchausen Syndrome" OR DE "Narcissistic Personality Disorder" OR DE "Neurasthenia" OR DE "Neurodermatitis" OR DE "Neuropsychiatry" OR DE "Neurosis" OR DE "Obsessions" OR DE "Obsessive Compulsive Disorder" OR DE "Obsessive Compulsive Personality Disorder" OR DE "Occupational Neurosis" OR DE "Ophidiophobia" OR DE "Organic Brain Syndromes" OR DE "Orthopsychiatry" OR DE "Outpatient Commitment" OR DE "Panic Disorder" OR DE "Panic" OR DE "Paranoia (Psychosis)" OR DE "Paranoia" OR DE "Paranoid Personality Disorder" OR DE "Paranoid Schizophrenia" OR DE "Passive Aggressive Personality Disorder" OR DE "Personality Disorders" OR DE "Pervasive Developmental Disorders" OR DE "Phantom Limbs" OR DE "Phobias" OR DE "Pica" OR DE "Postpartum Psychosis" OR DE "Posttraumatic Stress Disorder" OR DE "Presenile Dementia" OR DE "Pseudocyesis" OR DE "Pseudodementia" OR DE "Psychiatric Aides" OR DE "Psychiatric Clinics" OR DE "Psychiatric Hospital Admission" OR DE "Psychiatric Hospital Discharge" OR DE "Psychiatric Hospital Programs" OR DE "Psychiatric Hospital Readmission" OR DE "Psychiatric Hospital Staff" OR DE "Psychiatric Hospitalization" OR DE "Psychiatric Hospitals" OR DE "Psychiatric Nurses" OR DE "Psychiatric Patients" OR DE "Psychiatric Social Workers" OR DE "Psychiatric Symptoms" OR DE "Psychiatrists" OR DE "Psychiatry" OR DE "Psychological Stress" OR DE "Psychosis" OR DE "Psychosocial Rehabilitation" OR DE "Purging (Eating Disorders)" OR DE "Reactive Psychosis" OR DE "Retrograde Amnesia" OR DE "Rett Syndrome" OR DE "Rett Syndrome" OR DE "Schizoaffective Disorder" OR DE "Schizoid Personality Disorder" OR DE "Schizophrenia" OR DE "Schizophrenogenic Family" OR DE "Schizotypal Personality Disorder" OR DE "School Phobia" OR DE "Seasonal Affective Disorder" OR DE "Self Mutilation" OR DE "Semantic Dementia" OR DE "Senile Dementia" OR DE "Senile Psychosis" OR DE "Separation Anxiety" OR DE "Social Phobia" OR DE "Social Psychiatry" OR DE "Somatization Disorder" OR DE "Somatization" OR DE "Somatoform Disorders" OR DE "Somatoform Pain Disorder" OR DE "Suicide Prevention Centers" OR DE "Tay Sachs Disease" OR DE "Thought Disturbances" OR DE "Toxic Psychoses" OR DE "Transcultural Psychiatry" OR DE "Traumatic Neurosis" OR DE "Vascular Dementia" OR DE "Wernicke's Syndrome"
S23	AB ("mental health" OR "mental healthcare")
S22	TI ("mental health" OR "mental healthcare")
S21	AB (amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood W2 disorder#) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance W1 disorder#) OR (possession W1 disorder#) OR obsessional OR "severe stress" OR (adjustment W1 disorder#) OR dissociate OR "multiple personality" OR

	neurasthenia OR (psychological W1 disturbance#) OR (psychologically W1 disturbed) OR suicid* OR parasuicid* OR (self W1 harm*) OR (self W1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders")
S20	TI (amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood W2 disorder#) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance W1 disorder#) OR (possession W1 disorder#) OR obsessional OR "severe stress" OR (adjustment W1 disorder#) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological W1 disturbance#) OR (psychologically W1 disturbed) OR suicid* OR parasuicid* OR (self W1 harm*) OR (self W1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders")
S19	AB ("secure unit#" OR "secure hospital#")
S18	TI ("secure unit#" OR "secure hospital#")
S17	AB ("anankastic personalit*" OR "anorexia nervosa" OR "antisocial personalit*" OR "attention deficit disorder#" OR "body dysmorphic" OR "conduct disorder" OR "cyclothymic personalit*" OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems" OR "mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR "affective disorder*" OR "avoidant personalit*" OR "behavio#r disorder*" OR "behavio#r problem*" OR "behavioral disorder#" OR "behavioural disorder#" OR "conversion disorder *" OR "eating behavio#r" OR "eating W1 disorder#" OR "overactive disorder#" OR (personality N3 disorder#) OR agoraphobia OR Alzheimer* OR (anankastic N1 person*) OR (antisocial N1 person*) OR anxiety OR anxious OR (asocial N1 person*) OR Asperger* OR autism OR autistic OR (avoidant N1 person*) OR bipolar* OR "borderline personalit*" OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive N1 person*) OR (conversion W1 disorder*) OR cyclothymia OR delusion* OR (dependent N1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (dissocial N1 person*) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (histrionic N1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic N1 person*) OR neurasthenia OR neurosis OR neurot* OR (obsessive N1 person*) OR oligophreni* OR paranoia OR paranoid OR (passive-aggressive N1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR rett?s OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform)
S16	TI ("anankastic personalit*" OR "anorexia nervosa" OR "antisocial personalit*" OR "attention deficit disorder#" OR "body dysmorphic" OR "conduct disorder" OR "cyclothymic personalit*" OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems" OR "mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR "affective disorder*" OR "avoidant personalit*" OR "behavio#r disorder*" OR "behavio#r

	problem*" OR "behavioral disorder#" OR "behavioural disorder#" OR "conversion disorder *" OR "eating behavio#r" OR "eating W1 disorder#" OR "overactive disorder#" OR (personality N3 disorder#) OR agoraphobia OR Alzheimer* OR (anankastic N1 person*) OR (antisocial N1 person*) OR anxiety OR anxious OR (asocial N1 person*) OR Asperger* OR autism OR autistic OR (avoidant N1 person*) OR bipolar* OR "borderline personalit*" OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive N1 person*) OR (conversion W1 disorder*) OR cyclothymia OR delusion* OR (dependent N1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (dissocial N1 person*) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (histrionic N1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic N1 person*) OR neurasthenia OR neurosis OR neurot* OR (obsessive N1 person*) OR oligophreni* OR paranoia OR paranoid OR (passive-aggressive N1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR rett?s OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform)
S15	S1 or S8 or S9 or S10 or S11 or S12 or S13 or S14
S14	TI ((fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit# OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) N2 (smok* OR tobacco OR cigarette#))
S13	AB ((fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit# OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) N2 (smok* OR tobacco OR cigarette#))
S12	TI ("Controlled smoking") OR AB ("Controlled smoking")
S11	AB ("temporary abstinence" OR (temporar* N1 abstain*))
S10	TI ("temporary abstinence" OR (temporar* N1 abstain*))
S9	AB ((tobacco N1 control) OR (smoking N1 control) OR (smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))
S8	TI ((tobacco N1 control) OR (smoking N1 control) OR (smoking N3 services) OR (smoking N3 service) OR (anti N1 smoking) OR (anti N1 tobacco))
S7	S3 and S5
S6	S2 and S4
S5	AB (fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quits OR quitt* OR quit OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*)
S4	TI (fading OR temporary OR "give# up" OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quits OR quitt* OR quit OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*)
S3	AB ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)
S2	TI ("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)
S1	DE "Smoking Cessation"

Sociological Abstracts

Database platform: CSA Illumina
Database coverage dates: 1952-current
Date: 31/1/2012
No. of records 191
Date limit 1985-2012

Query: (((TI=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars) OR AB=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)) and(TI=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) OR AB=(fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quitt* OR quits OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*))) or(TI=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti) OR AB=(tobacco WITHIN 1 control) OR (smoking WITHIN 1 control) OR (smoking WITHIN 3 services) OR (smoking WITHIN 3 service) OR (anti WITHIN 1 smoking) OR (anti WITHIN 1 tobacco) OR (control WITHIN 1 tobacco) OR (control WITHIN 1 smoking) OR (smoking WITHIN 1 anti) OR (tobacco WITHIN 1 anti)) or(TI=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*) OR AB=("temporary abstinence") OR (temporar* WITHIN 1 abstain*) OR (abstain* WITHIN 1 temporar*)) or(TI=("controlled smoking") OR AB=("controlled smoking")) or(TI=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*))) or(AB=((fading OR temporary OR (give* up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit OR quits OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*) WITHIN 2 (smok* OR tobacco OR cigarette*))) or(DE=("smoking"))) and((TI=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems") OR AB=((anankastic WITHIN 1 personalit*) OR "anorexia nervosa" OR (antisocial WITHIN 1 personalit*) OR ("attention deficit" WITHIN 1 disorder*) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic WITHIN 1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")) or(TI=("mentally ill" OR

"obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder$) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)) OR AB=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder$) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic))) or(TI=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*) OR AB=((histrionic WITHIN 1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic WITHIN 1 person*) OR (person* WITHIN 1 narcissistic) OR neurasthenia OR neurosis

OR neurot* OR (person* WITHIN 1 obsessive) OR (obsessive WITHIN 1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* WITHIN 1 passive-aggressive) OR (passive-aggressive WITHIN 1 person*) OR phobia* OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR "rett's" OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure WITHIN 1 unit) OR (secure WITHIN 1 units) OR (secure WITHIN 1 hospital*) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood WITHIN 2 disorder*) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance WITHIN 1 disorder*) OR (possession WITHIN 1 disorder*) OR obsessional OR "severe stress" OR (adjustment WITHIN 1 disorder*) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological WITHIN 1 disturbance*) OR (psychologically WITHIN 1 disturbed) OR suicid* OR parasuicid*)) or(TI=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare") OR AB=((self WITHIN 1 harm*) OR (self WITHIN 1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder" OR "adjustment disorders" OR "mental health" OR "mental healthcare")) or(TI=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic)) OR AB=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective WITHIN 1 disorder*) OR (avoidant WITHIN 1 personalit*) OR (behavio* problem*) OR (behavio* WITHIN 1 disorder*) OR (conversion WITHIN 1 disorder*) OR (eating WITHIN 1 behavio*) OR (eating WITHIN 1 disorder*) OR (overactive WITHIN 1 disorder*) OR (personality WITHIN 3 disorder*) OR agoraphobia OR Alzheimer* OR (anankastic WITHIN 1 person*) OR (antisocial WITHIN 1 person*) OR anxiety OR anxious OR (person* WITHIN 1 asocial) OR Asperger* OR autism OR autistic OR (person* WITHIN 1 avoidant) OR bipolar* OR (borderline WITHIN 1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive WITHIN 1 person*) OR (conversion WITHIN 1 disorder*) OR cyclothymia OR delusion* OR (dependent

WITHIN 1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* WITHIN 1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* WITHIN 1 histrionic))) or(DE=("affective illness" or "anorexia nervosa" or "anxiety" or "attention deficit disorder" or "autism" or "bulimia" or "community mental health" or "community mental health centers" or "comorbidity" or "compulsivity" or "defense mechanisms" or "deinstitutionalization" or "depersonalization" or "depression psychology" or "eating disorders" or "emotionally disturbed" or "hysteria" or "mental health" or "mental health services" or "mental hospitals" or "mental illness" or "mental patients" or "narcissism" or "neurosis" or "neuroticism" or "paranoia" or "personality disorders" or "phobias" or "posttraumatic stress disorder" or "psychiatry" or "psychosis" or "schizophrenia" or "senility" or "sociopathic personality")))

Social Policy and Practice

Database host: OVID
Date searched: 10/2/2012, issue 201201
Number of records: 273

1 (hospital or hospitals).af. (14403)
2 (mental* or Psychiatr* or disorder or disorders or schiz* or Rett or Retts or hysteria or hallucin* or dysthymi* or dissociativ* or depression or depressive or dependency or delusion* or dementia* or cyclothymic or delirium or rehabilitation or affective or psychot* or pyschos* or anorexi* or anankastic* or anxiety or anxious or alzheimer* or "attention deficit" or avoidant or bipolar or dysmorphi* or (borderline adj1 personalit*) or bulimi* or catatoni* or "child behavior" or "child behaviour" or compulsive or pica or munchausen or "impulse control" or asthenia or "stereotypic movement" or dyslexi* or "binge eating" or capgras or "developmental disabilities" or "developmental disability" or "child development" or factitious or somatoform or somatic* or sociopath* or posttraumatic or "post traumatic" or phobic or phobia* or "passive aggressive" or paranoid or paranoia or oligophreni* or obsessive or antisocial).af. (89985)
3 ("folie a deux" or panic or avoidant or "behavior problem*" or "behaviour problem*" or asperger* or autism or autistic or compulsion* or dereali?ation or depersonali?ation or disintegrative or dissocial or dissociat* or fugue or hebephreni* or histrionic or hyperkinetic or hypomania or mania* or manic* or narcissis* or neurasthenia or neurosis or neurot* or oligophreni*).af. (9412)
4 "secure unit* ".af. (718)
5 (amensi* or hypomania or cyclomania or dysthymia or asthenic or "emotionally labile" or trance or postencephalitic or postconcussion or possession or obsessional or adjustment or dissociate or "multiple personal*" or (pyschological* adj disturb*) or suicid* or parasuicid* or "self harm*" or "self injur*" or comorbid* or neuros* or OCD or "pyschological stress" or "psychological distress" or adjustment).af. (8779)
6 1 or 2 or 3 or 4 or 5 (104831)
7 (fading or temporary or "give up" or "gives up" or "given up" or "giving up" or cessat* or withdraw* or ceas* or stop* or schedul* or quit* or reduc* or abstain* or prevent* or abstinence or restrict*).ab,de,ti. (47600)
8 ("controlled smoking" or "tobacco control" or "smoking control" or (smoking adj3 service*) or "anti smoking" or "anti tobacco" or "temporary abstinence" or (temporar* adj abstain*)).ab,de,ti. (179)
9 "cigar*".ab,de,ti. (333)
10 smoking.ab,de,ti. (2436)
11 tobacco.ab,de,ti. (790)
12 9 or 10 or 11 (2698)
13 7 and 12 (970)
14 8 or 13 (1038)
15 6 and 14 (275)
16 ((mental adj health*) or mentally or (mental* adj ill*) or (mental adj problem*) or (mental adj disorder*) or Psychiatr* or disorder or disorders or schiz* or Rett or Retts or hysteria or hallucin* or dysthymi* or dissociativ* or depression or depressive or dependency or delusion* or dementia* or cyclothymic or delirium or rehabilitation or affective or psychot* or pyschos* or anorexi* or anankastic* or anxiety or anxious or alzheimer* or "attention deficit" or avoidant or bipolar or dysmorphi* or (borderline adj1 personalit*) or bulimi* or catatoni* or "child behavior" or "child behaviour" or compulsive or pica or munchausen or "impulse control" or asthenia or "stereotypic movement" or dyslexi* or "binge eating" or capgras or "developmental disabilities" or

"developmental disability" or "child development" or factitious or somatoform or somatic* or sociopath* or posttraumatic or "post traumatic" or phobic or phobia* or "passive aggressive" or paranoid or paranoia or oligophreni* or obsessive or antisocial).af,ab,ti. (86975)
17 1 or 3 or 4 or 5 or 16 (102186)
18 14 and 17 (273)

Social Science Citation Index and Conference Proceedings Citation Index, (science, and social science and humanities)

Database platform: Web of Science
Date searched 31 January 2012
Records: 3614
Search strategy:
Timespan=1985-2012
Lemmatization=Off

15 #14 AND #5

14 #13 OR #10 OR #9 OR #8 OR #7 OR #6

13 #12 AND #11

12 TS=("hand-roll" OR handroll* OR "hand-rolls" OR "hand-rolled" OR bidi OR bidis OR beedi OR beedis OR rolie OR rolies OR paan OR gutkha OR snuff OR betel OR cigar OR cigars)

11 TS=((fading OR temporary OR (give* NEAR/1 up) OR "giving up" OR cessat* OR withdraw* OR ceas* OR stop* OR schedul* OR quit$ OR quitt* OR reduc* OR abstain* OR prevent* OR abstinence OR restrict*))

10 TS=((fading NEAR/2 tobacco) OR (temporary NEAR/2 tobacco) OR ("giving up" NEAR/2 tobacco) OR (cessat* NEAR/2 tobacco) OR (withdraw* NEAR/2 tobacco) OR (ceas* NEAR/2 tobacco) OR (stop* NEAR/2 tobacco) OR (schedul* NEAR/2 tobacco) OR (quit NEAR/2 tobacco) OR (quits NEAR/2 tobacco) OR (quitt* NEAR/2 tobacco) OR (reduc* NEAR/2 tobacco) OR (abstain* NEAR/2 tobacco) OR (prevent* NEAR/2 tobacco) OR (abstinence NEAR/2 tobacco) OR (restrict* NEAR/2 tobacco)) OR TS=((("give* up") NEAR/2 tobacco))

9 TS=((fading NEAR/2 cigarette$) OR (temporary NEAR/2 cigarette$) OR ("giving up" NEAR/2 cigarette$) OR (cessat* NEAR/2 cigarette$) OR (withdraw* NEAR/2 cigarette$) OR (ceas* NEAR/2 cigarette$) OR (stop* NEAR/2 cigarette$) OR (schedul* NEAR/2 cigarette$) OR (quit NEAR/2 cigarette$) OR (quits NEAR/2 cigarette$) OR (quitt* NEAR/2 cigarette$) OR (reduc* NEAR/2 cigarette$) OR (abstain* NEAR/2 cigarette$) OR (prevent* NEAR/2 cigarette$) OR (abstinence NEAR/2 cigarette$) OR (restrict* NEAR/2 cigarette$)) OR TS=((("give* up") NEAR/2 cigarette$))

8 TS=(("give* up") NEAR/2 smok*)

7 TS=((fading NEAR/2 smok*) OR (temporary NEAR/2 smok*) OR ("giving up" NEAR/2 smok*) OR (cessat* NEAR/2 smok*) OR (withdraw* NEAR/2 smok*) OR (ceas* NEAR/2 smok*) OR (stop* NEAR/2 smok*) OR (schedul* NEAR/2 smok*) OR (quit NEAR/2 smok*) OR (quits NEAR/2 smok*) OR (quitt* NEAR/2 smok*) OR (reduc* NEAR/2 smok*) OR (abstain* NEAR/2 smok*) OR (prevent* NEAR/2 smok*) OR (abstinence NEAR/2 smok*) OR (restrict* NEAR/2 smok*))

6 TS=("temporary abstinence" OR (temporar* NEAR/1 abstain*) OR (abstain* NEAR/1 temporar*) OR (controlled NEAR/1 smoking))

5 1,293,776 #4 OR #3 OR #2 OR #1

4 TS=((self NEAR/1 harm*) OR (self NEAR/1 injur*) OR comorbid* OR bulimi* OR anorexi* OR neuros* OR OCD OR "psychological stress" OR "psychological distress" OR "mental stress" OR "adjustment disorder$" OR "mental health" OR "mental healthcare")

3 TS=((histrionic NEAR/1 person*) OR hyperkinetic OR hypomania OR hysteria OR mania* OR manic* OR (narcissistic NEAR/1 person*) OR (person* NEAR/1 narcissistic) OR neurasthenia OR neurosis OR neurot* OR (person* NEAR/1 obsessive) OR (obsessive NEAR/1 person*) OR oligophreni* OR paranoia OR paranoid OR (person* NEAR/1 passive-aggressive) OR (passive-aggressive NEAR/1 person*) OR phobia$ OR phobic OR posttraumatic OR psychiatr* OR psychopath* OR psychos* OR psychot* OR rett OR (rett NEAR/2 s) OR retts OR schiz* OR sociopath* OR somati?ation OR somatoform OR (secure NEAR/1 unit$) OR (secure NEAR/1 hospital$) OR amnesi* or hypomania OR cyclothymia or dysthymia or dementia OR delirium OR hallucinosis OR delusional OR (mood NEAR/2 disorder$) OR asthenic OR "emotionally labile" OR postencephalitic OR postconcussion* OR (trance NEAR/1 disorder$) OR (possession NEAR/1 disorder$) OR obsessional OR "severe stress" OR (adjustment NEAR/1 disorder$) OR dissociate OR "multiple personality" OR neurasthenia OR (psychological NEAR/1 disturbance$) OR (psychologically NEAR/1 disturbed) OR suicid* OR parasuicid*)

2 TS=("mentally ill" OR "obsessive compulsive" OR "panic disorder" OR "panic disorders" OR "pervasive developmental" OR "post traumatic" OR "seasonal affective" OR (affective NEAR/1 disorder$) OR (avoidant NEAR/1 personalit*) OR (behavio* problem$) OR (behavio* NEAR/1 disorder$) OR (conversion NEAR/1 disorder$) OR (eating NEAR/1 behavio*) OR (eating NEAR/1 disorder$) OR (overactive NEAR/1 disorder$) OR (personality NEAR/3 disorder$) OR agoraphobia OR Alzheimer* OR (anankastic NEAR/1 person*) OR (antisocial NEAR/1 person*) OR anxiety OR anxious OR (person* NEAR/1 asocial) OR Asperger* OR autism OR autistic OR (person* NEAR/1 avoidant) OR bipolar* OR (borderline NEAR/1 personalit*) OR bulimia OR catatonia OR catatonic OR compulsion* OR (compulsive NEAR/1 person*) OR (conversion NEAR/1 disorder$) OR cyclothymia OR delusion* OR (dependent NEAR/1 personalit*) OR depersonali?ation OR depression* OR depressive OR dereali?ation OR disintegrative OR (person* NEAR/1 dissocial) OR dissociation* OR dissociative OR dysthym* OR fugue OR hallucination* OR hebephreni* OR (person* NEAR/1 histrionic))

1 TS=((anankastic NEAR/1 personalit*) OR "anorexia nervosa" OR (antisocial NEAR/1 personalit*) OR ("attention deficit" NEAR/1 disorder$) OR "body dysmorphic" OR "conduct disorder" OR "conduct disorders" OR (cyclothymic NEAR/1 personalit*) OR "endogenous depression" OR "folie a deux" OR "mental disorder" OR "mental disorders" OR "mental illness" OR "mental illnesses" OR "mental problem" OR "mental problems")

UK Clinical Research Network Portfolio database

Search date: 17/2/2012
Number of records: 3

Search:
All topic areas,
Title/ research summary: smoke, smoking, tobacco, smoke-free, smokefree (one of the words)

APPENDIX 1B. WEBSITES SEARCH SUMMARY

	Websites searched	Results
1.	Smoke free http://smokefree.nhs.uk	0
2.	NHS Centre for Smoking Cessation and Training http://www.ncsct.co.uk/	4
3.	Action on Smoking and Health (ASH) http://www.ash.org.uk	5
4.	Treat tobacco.net http://www.treatobacco.net/en/index.php	0
5.	Society for Research on Nicotine and Tobacco http://www.srnt.org	0
6.	International Union against Cancer http://www.uicc.org	0
7.	WHO Tobacco Free Initiative (TIF) http://www.who.int/tobacco/en	0
8.	International Tobacco Control Policy Evaluation Project http://www.itcproject.org	0
9.	Tobacco Harm Reduction http://www.tobaccoharmreduction.org/index.htm	0
10.	Current controlled trials www.controlled-trials.com	0
11.	Association for the treatment of tobacco use and dependence (ATTUD) www.attud.org	0
12.	National Institute on drug abuse- the science of drug abuse and addiction http://www.nida.nih.gov/nidahome.html	1
13.	NICE	0
14.	Public health observatories	1
15.	Scottish Government	1
16.	Welsh Assembly Government	0
17.	NHS Evidence	15
18.	Joseph Rowntree Foundation	0
19.	UK Centre for Tobacco Control Studies	8
Total no of articles found		**35**
Total no. of new articles entered into ER4[a]		**15**

Note. [a] Twenty of the documents found through web searches had already been captured by the electronic search of databases.

APPENDIX 2. INCLUSION DECISION QUESTIONS APPLIED AT TITLE AND ABSTRACT SCREENING STAGE

Criterion	Guidance notes	Decision
1. YEAR: Was the document published during or after 1980?	Include studies published during or after 1980, exclude studies before 1980.	If yes, proceed to 2. If no, use EX1 – NOT YEAR
2. EMPIRICAL RESEARCH: does document report on a piece of research?	This can include primary research, in that data have been collected during that study through interaction with or observation of study participants, or secondary research, such as systematic reviews of the literature. MUST have methodology section. Examples of non-research documents include opinion pieces, commentaries, or legislation	If yes, proceed to 3. If no, use EX2 – NOT EMPIRICAL RESEARCH
3. SMOKING CESSATION: Does the title or abstract refer to smoking cessation interventions/ services?	This includes smoking cessation or temporary abstinence approaches, and any approaches used by, or with, health professionals to increase recording, identification and/or referral to stop smoking services or mental healthcare-based stop-smoking services. We will include any pharmacological, psychological or self-help intervention that aims to assist with smoking cessation or temporary abstinence. Interventions of relevance can include pharmacological interventions, administered alone or in combination with other interventions; psychological interventions, including behavioural support, counselling and advice (with and without a pharmacological intervention); self-help approaches to smoking cessation or temporary abstinence without additional support. Psychological interventions could include concomitant use of pharmacological interventions to assist with cessation prior to the target quit date; however, use of pharmacological interventions needs to be equivalent in the active and comparator groups before and after cessation. Psychological interventions could be offered with the pharmacological intervention; however, the type and intensity of support needs to be comparable between the active and comparator groups. Pharmacological interventions that have not been currently licensed for temporary abstinence will also be eligible for inclusion. We will include any strategies, protocols or systems used by relevant health professionals to help identify smokers, record advice given and refer them to services, alone and share information between different groups of health professionals and across the care pathway.	If yes, proceed to 4. If no, use EX3 – NOT SMOKING CESSATION
4. MENTAL HEALTH: Is the study	This includes assessment, care and treatment for people with severe mental illness in hospitals,	If yes, proceed to 5.

(or a component of it) conducted in a mental health secondary care setting, or does it include patients or workers in mental health services, or family/friends/visitors of mental health patients?	outpatient clinics and the community, as well as intensive services in psychiatric units and secure hospitals. This includes people who use secondary care mental health services (including those who are in the process of being referred to, or have recently been discharged from: child, adolescent, adult and older people's mental health services inpatient, residential and long-term care for severe mental illness in a hospital, psychiatric and specialist unit or secure hospital). This includes those who live in the same household as someone who is using secondary care mental health services, such as partners, parents, other family members and carers. Includes those who visit people in secondary care mental health settings. This includes those who work in secondary care mental health settings, in particular, those who have direct contact with people using the services (also includes support staff, volunteers, those working for agencies or as locums, and staff employed by contractors.)	If no, use EX4 – NOT MENTAL HEALTH
5. RESEARCH DESIGN: Is the study design a comparison (e.g., controlled trials, before-and-after) and/or views or process evaluation (e.g., interviews, surveys)?	The study must be a comparison design or include views/process data on barriers and facilitators. Eligible comparison designs: reviews of reviews, systematic reviews and guidelines (including NICE guidelines), randomised controlled trials, controlled trials, controlled before and after studies, interrupted time series, and uncontrolled before and after studies. Eligible views/process evaluations: This includes trials (controlled and non-controlled), descriptive studies (including questionnaire surveys, and process evaluations), qualitative studies (including, but not restricted to, ethnographies, phenomenologies, and grounded theory studies), discussion papers or reports, and 'views studies' (which are written based on a multiple perspective approach with an emphasis on guidance for health professionals). Single case studies should be excluded.	If yes, proceed to 6. If no, use EX5 – NOT RESEARCH DESIGN
6. EFFECTIVENESS: Does the study evaluate the effectiveness of an intervention?	The study must evaluate the effectiveness of intervention (or interventions) either through a comparison with a control group or comparison across time, or through reviews of the evidence. Specifically: reviews of reviews, systematic reviews and guidelines (including NICE guidelines), randomised controlled trials, controlled trials, controlled before and after studies, interrupted	If yes, use IN1 - EFFECTIVENESS. Then proceed to 6.

	time series, and uncontrolled before and after studies.	If no, proceed to 7.
7. BARRIERS/FACILITATORS: Does the title or abstract include barriers or facilitators (including knowledge, attitudes and beliefs) of using or implementing smoking cessation interventions/ services?	This includes trials (controlled and non-controlled), descriptive studies (including questionnaire surveys, and process evaluations), qualitative studies (including, but not restricted to, ethnographies, phenomenologies, and grounded theory studies), discussion papers or reports, and 'views studies' (which are written based on a multiple perspective approach with an emphasis on guidance for health professionals)	If yes, use IN2 - BARRIERS/FACILITATORS. End of criteria.

APPENDIX 3. CHECKLIST FOR SCREENING OF FULL TEXT ARTICLES AND DATA EXTRACTION FORMS

CHECKLIST FOR SCREENING OF FULL TEXT ARTICLES

Criterion	Guidance notes	Decision
1. Type of Participant	To include mental health staff and participants with a current mental health diagnosis which meets diagnostic criteria to be included: schizophrenia, schizotypal and delusional disorders; mood (affective) disorders; neurotic, stress-related and somatoform disorders; Eating disorders; specific personality disorders, mixed and other personality disorders, enduring personality changes; pervasive developmental disorders; hyperkinetic disorder, conduct disorder, mixed disorders of conduct and emotions.	
2. Phenomena of Interest	To consider barriers or facilitators (knowledge, attitudes and beliefs) of using or implementing smoking cessation or temporary abstinence approaches, and any approaches used by, or with, mental health professionals/care providers/the wider care team to increase recording, identification and/or referral to SSS or mental healthcare-based SSS.	
3. Study design	To include qualitative and quantitative evidence and systematic reviews. To include trials (controlled and non-controlled), descriptive studies (including questionnaire surveys, and process evaluations), qualitative studies (including ethnographies, phenomenologies, and grounded theory studies), discussion papers or reports, and 'views studies' (based on a multiple perspective approach with an emphasis on guidance for health professionals). To consider other paradigms if not based on the interpretative paradigm.	

DATA EXTRACTION FORMS

REVIEW 5 DATA EXTRACTION FORM (qualitative data)

Reviewer name: Date form completed:

Study Author and Year:

Title:

	Details	**Score**
Design of study (Quantitative/qualitative) – is a qualitative approach appropriate?		Appropriate Inappropriate Not sure
Study Aim (testing an intervention or opinion/view based) – is the study clear in what it seeks to do? Is the purpose of the study discussed? Is there adequate/appropriate reference to the literature? Are underpinning values/assumptions/theory discussed?		Clear Unclear Mixed
Study design How defensible/rigorous is the research design/methodology? Is it appropriate? Is the rationale given? Are there clear accounts of the rationale/justification for the sampling, data collection and data analysis techniques used? Is the selection of cases/sampling strategy theoretically justified?		Defensible Indefensible Not sure
Context of study Is the context clearly described? Are the characteristics of the participants and settings clearly defined? Were observations made in a sufficient variety of circumstances? Was context bias considered? (Inpatient/community/unknown)		Clear Unclear Not sure
Participants – inclusion and exclusion criteria (MH diagnosis /demographics/sample size)		Clear Unclear Not sure / inadequately reported
Methods How well was the data collection carried out? Are the data collection methods clearly described? Were the appropriate data collected		Appropriately Inappropriately

to addressed the research question? Was the data collection and record keeping systematic?		Not sure / inadequately reported
Were the methods reliable? Was data collected by more than one method? Is the justification for triangulation, or for not triangulating? Do the methods investigate what they claim to?		Reliable Unreliable Not sure
Role of Researcher Is the role of the researcher clearly described?		Clearly described Unclear Not described
Reflexive statement given?		Yes No

Themes

1. Staff knowledge, skills, and competencies
2. Systems and policies
3. Illness related issues
4. Environmental /psychological issues
5. Cessation i) intervention related ii) services related

Barriers	
Themes For cessation or abstinence. Used by MH professionals/care providers/care teams/referrals to SSS. Community, primary, and secondary care mental health care providers Evidence or opinion based.	1. 2. 3. 4. 5. i) ii)

Facilitators	
Themes For cessation or abstinence. Used by MH professionals/care providers/care teams/referrals to SSS. Community, primary, and secondary care mental health care providers Evidence or opinion based.	1. 2. 3. 4. 5. i) ii)

Quality			
Is the data analysis sufficiently rigorous? Is the procedure explicit, how systematic is the analysis, is it clear how the themes were derived?	Rigorous	Not rigorous	Not sure/not reported
Are the data 'rich'? How well are the contexts of the data described? Has the diversity of perspective and content been explored? How well has the detail and depth been demonstrated?	Rich	Poor	Not sure/not reported
Is the analysis reliable? Did more than one researcher theme and code transcripts/data? If so, how were differences resolved?	Reliable	Unreliable	Not sure/not reported
Are the findings convincing? Are the findings clearly presented? Are the findings internally coherent?	Convincing	Not convincing	Not sure
Are the findings relevant to the aims of the study?	Relevant	Irrelevant	Partially relevant
Conclusions How clear are the links between data, interpretation and conclusion? Are the conclusions plausible and coherent? Have alternative explanations been	Adequate	Inadequate	Not sure

explored and discounted? Does this enhance the understanding of the research topic? Are the implications of the research clearly defined? Is the adequate discussion of any limitation encountered?	
Ethics How clear and coherent is the reporting of ethics? Have ethical issues been taken into consideration? Are they adequately discussed Have the consequences of the research been considered, i.e. raising expectations, changing behaviour? Was the study approved by an ethics committee?	Appropriate inappropriate Not sure/not reported

Policy and Practice	
Generalisability To what extent are the study findings generalisable? What is the country of study? How applicable are the study findings to the system in the UK?	
Implications for policy	
Implications for practice	
Overall assessment **As far as can be ascertained from the paper, how well was the study conducted?**	++ + - ++ all or most of the checklist have been fulfilled, where they have not been fulfilled the conclusion are very unlikely to alter + Some checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately describe, the conclusion are unlikely to alter - Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter

REVIEW 5 DATA EXTRACTION FORM (Survey data)

Reviewer name: Date form completed:

Study Author and Year:

Title:

Study Design

Design of study		Appropriate Inappropriate Not sure
Study Aim (testing an intervention or opinion/view based) – is the study clear in what it seeks to do? Is the purpose of the study discussed? Is there adequate/appropriate reference to the literature? Are underpinning values/assumptions/theory discussed?		Clear Unclear Mixed
Study methods How defensible/rigorous is the research design/methodology? Is it appropriate? Is the rationale given?		Defensible Indefensible Not sure
Context of study Is the context clearly described? Are the characteristics of the participants and settings clearly defined? Were observations made in a sufficient variety of circumstances? (Inpatient/community/unknown)		Clear Unclear Not sure

Population and setting

Is the source population or source area well described? Was the country (e.g. developed or nondeveloped, type of healthcare system), setting (primary schools, community centres etc.), location (urban, rural), population demographics etc. adequately described?		++ + – NR NA
Do the selected participants or areas represent the eligible population or		++

area? Was the method of selection of participants from the eligible population well described? What % of selected individuals agreed to participate? Were there any sources of bias? Were the inclusion/exclusion criteria explicit and appropriate?		+ – NR NA
Type/s of mental Illness the study/staff members/carers are dealing with (Schizophrenia/depression/mood affective disorder)		
Data collection How well was the data collection carried out? Are the data collection methods clearly described? Were the appropriate data collected to address the research question? Was the data collection and record keeping systematic?		Appropriately Inappropriately Not sure / inadequately reported

Overall applicability/relevance of context/findings for review 5*:

High_ medium low marginal

Results

Number of participants	
Age (mean, SD, range):	
Sex (n, % male):	
Mental Illness / Staff grade break down.	

Analysis

Are there clear accounts of the data analysis techniques used?		Clear Unclear Not sure

Themes

1. Staff knowledge, skills, and competencies
2. Systems and policies

3. Illness related issues
4. Environmental /psychological issues
5. Support needed/suggested (facilitators)
6. Cessation i) intervention related ii) services related

Barriers	
Themes	1. 2. 3. 4. 5. 6.

Facilitators	
Themes	1. 2. 3. 4. 5. 6.

****For surveys: reference to table (table number/topic/page number)*:**

Is the data analysis sufficiently rigorous? Is the procedure explicit, how systematic is the analysis, is it clear how the themes were derived? Triangulation? More than one researcher?	Rigorous Not rigorous Not sure/not reported NA	
Are the findings generalisable to the source population (i.e. externally valid)? Are there sufficient details given about the study to determine if the findings are generalisable to the source population? Consider: participants, outcomes, resource and policy implications.		++ + – NR NA
Applicability to UK setting?		High Medium Low

Policy and practice

Implications for policy
Implications for practice

Further Comments (to include any links with other papers in R5	

Overall scoring

++ + - not sure

Scoring from NICE guidelines

Checklist items are worded so that one of five responses is possible:

++ Indicates that for that particular aspect of study design, the study has been designed/conducted in such a way as to minimise the risk of bias.

+ Indicates that either the answer to the checklist question is not clear from the way the study is reported, or that the study may not have addressed all potential sources of bias for that particular aspect of study design.

– Should be reserved for those aspects of the study design in which significant sources of bias may persist.

Not reported (nr) should be reserved for those aspects in which the study under review fails to report how they have/might have been considered.

Not applicable (na) Should be reserved for those study design aspects which are not applicable given the study design under review.

APPENDIX 4. REFERENCES TO INCLUDED STUDIES

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DISCUSSION PIECES

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APPENDIX 5. EVIDENCE TABLE FOR INCLUDED STUDIES

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Adopaca **Year:** 2007 **Quality score:** +	**What was/were the research questions:** To identify factors that are related to readiness to quit smoking among adolescent smokers **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Survey **By whom:** Not reported **What setting(s):** Inpatient **When:** Not reported	**What populations where the sample recruited from:** Private psychiatric hospital in north-eastern USA **How were they recruited:** Identified from participants enrolled in clinical trial evaluating motivational interviewing to reduce smoking smoking among adolescents hospitalised for a psychiatric disorder **How many participants were recruited:** 191 **Were there specific exclusion critera:** Having a current psychotic disorder **Were there specific inclusion criteria:** 13-17 years of age, reported smoking at least oe cigarette per week for the	**Brief description of method and process of analysis:** Bivariate correlations were examined to assess which factors were correlated with readiness to change. Multiple regression was then used to examine the unique effects of the predictors **Key themes (with illustrative quotes if available) relevant to this review:**	**Limitations identified by author:** Lack of generalisability to smoking adolescents in general **Limitations identified by team:** Participants enrolled in RCT **Evidence gaps and/or recommendations for future research:** Not reported **Source of funding:** National Cancer Institute

		four weeks prior to hospitalisation, and had access to a telephone		

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Ashton **Year:** 2010 **Quality score:** +	**What was/were the research questions:** The aims of this study were to assess mental health workers ' attitudes to addressing patients' tobacco use, to identify any perceived barriers that prevent people with mental illness from receiving the support they require to tackle tobacco use, and to determine the workers' recommendations for policy and practice change within mental health services in South Australia. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Questionnaire survey with open ended questions. **By whom:** Not reported	**What populations where the sample recruited from:** Mental health workers from government and non-government adult mental health services in Adelaide, South Australia. Government mental health services. **How were they recruited:** The list of government adult mental health services was obtained from the White Pages telephone directory, and a list of all non-government mental health services was provided by the Mental Health Coalition, the South Australian non-government mental health peak body. **How many participants were recruited:** 324 completed questionnaires were returned from mental health workers of various occupations –	**Brief description of method and process of analysis:** Descriptive statistics for demographics and ratings were computed using SPSS version 15.0. Qualitative data were analysed using interpretive analysis, which involved two key stages of grounded theory, open coding and categorization. For this process, data were coded by three independent researchers, two with extensive clinical mental health experience and expertise in tobacco research with these populations and one with extensive experience in tobacco control research and evaluation. Responses were coded into categories identified by the researchers, and where a response fitted into more than one of the categories, multiple categories were allowed. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudeds and beliefs regarding smoking in patients A. Smoking as a personal choice Staff attitudes towards smoking cessation in patients B. Postive beliefs regarding quitting "*Tobacco use leads to long term poor health and financial problems"* "*Clients are in crisis and are often long term smokers, I think it is difficult but important."*	**Limitations identified by author:** Conducted only within the Adelaide metropolitan area and therefore only provides feedback from mental health workersin this location. 24% of the responses were received from organizations where the team leader failed to describe the type of organization and number of staff, this meant comparisons between organisations and information about the proportion of staff completing the questionnaire is not available. The study asked workers to report their feelings about tobacco use within mental health services; it did not measure actual worker practices. The study was only conducted in 2007 and since that time many mental health workers in South Australia have been involved in training about

	What setting(s): Inpatient & Community. **When:** August 2007	across 45 organisations (60% response rate) **Were there specific exclusion critera:** Mental health workers from private and child and adolescent mental health services were not included as their needs were considered to differ to those of government and non-government adult mental health services. **Were there specific inclusion criteria:** Included acute and extended care inpatient units, rehabilitation, community care, and assessment and crisis intervention services. Non-government mental health services included supported accommodation, respite, personal care, drop-in centres, supported employment and other support services.	"*I believe people should have a choice if they want to smoke or not.*" "*Important if client wishes to make changes.*" D. Roles and responsibilities of staff in quitting *"My patients are not interested; I do not think I am the smoking police."* Perceived barriers and facilitators to quitting in patients A. Motivation, nicotine dependence, psycholosocial, and environmental factors *"Mental health clients [were] already highly stressed and vulnerable"* Systems and policies B. Time and other resources "*Time restraints often mean other issues increase in priorities"* Staff perceptions regarding interventions for smoking cessation in patients D. Information and accessibility of support for patients	helping people with mental health to address tobacco use. **Limitations identified by team:** None identified. **Evidence gaps and/or recommendations for future research:** Finding indicates some mental health workers are still ambivalent about addressing tobacco use or lack the skills and confidence and it suggests there is a need for professional development for all mental health workers. This finding also indicates there is a need to incorporate asking about tobacco use in standardized assessments and address it within the development of mental health care plans. **Source of funding:** Funded by the South Australian Department of Health.

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Dickens **Year:** 2004 **Quality score:** +	**What was/were the research questions:** Aimed to examine differences in attitudes and beliefs about smoking between nurses and other professional groups in mental health settings. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Cross sectional survey. **By whom:** Not reported **What setting(s):** Inpatient. **When:** January 2003	**What populations where the sample recruited from:** All full and part time clinical employees working at a specialist charitable-status psychiatric hospital in the UK – registered nurses, nursing assistants, other health professionals **How were they recruited:** Employees were invited to opt out of receiving a questionnaire but none did so. Questionnaires and return envelopes were distributed in January 2003; all materials were unmarked so the researchers were not able to identify individual respondents in any way. **How many participants were recruited:** 690 staff members (50.3%). **Were there specific exclusion critera:** Bank and agncy staff.	**Brief description of method and process of analysis:** Responses from completed questionnaires were analysed using SPSS 11.0. Chi-square with Yates' correction for continuity was employed to detect significant differences in; Fishers' exact test was utilized where expected cell frequency was less than 5. All chi-square tests were 2-tailed, reflecting the nondirectional hypotheses of the study. For comparisons between smokers and non-smokers, ex-smokers of 12 months or less (*n* = 7) were excluded, and ex-smokers of 12+ months duration were categorized as non-smokers. Differences in age between groups were analysed using the non-parametric Mann–Whitney *U* -test. Additional comments related to each question were transcribed, collated and subjected to a basic content analysis. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudeds and beliefs regarding smoking in patients A. Smoking as a personal choice *"If they choose to."* *"Up to the individual."* "*They are adults and can decide for themselves."* Staff attitudes towards smoking cessation in patients	**Limitations identified by author:** Low response rate. Restrcited demographic information (to promote uptake). Self report issues; under-reporting of unhealthy behaviours. **Limitations identified by team:** None identified. **Evidence gaps and/or recommendations for future research:** This survey indicates that nurses' attitudes may have further to move in order to accept these premises and that educational resources and change management may need to be concentrated on this group. In a local context, our next steps will be to continue to build upon our staff and patient smoking cessation campaigns. **Source of funding:** Not reported.

		Were there specific inclusion criteria: None reported.	C. Influence of staff smoking status on patients E. Perceived impact of quitting on mental health Staff perceptions regarding interventions for smoking cessation in patients D. Information and accessibility of support for patients "*[Patients] should be educated to give them an informed choice."*	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Dickens **Year:** 2005 **Quality score:** +	**What was/were the research questions:** Views and beliefs of psychiatric inpatients about smoking in hospital. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Questionnaire survey, plus patients were invited to comments/ expand on their individual answers. **By whom:** Researchers **What setting(s):** Inpatients **When:** March – April 2004.	**What populations where the sample recruited from:** Inpatients from the forensic wards of a large independent psychiatric hospital – Northampton, UK. **How were they recruited:** Invited to be interviewed. **How many participants were recruited:** 45 agreed (44.1% response rate). **Were there specific exclusion critera:** advised by ward teams not to approach 16 patients due to current mental state. N=102 invited to be interviewed. **Were there specific inclusion criteria:** All patients in the adult forensic mental health division of St Andrews	**Brief description of method and process of analysis:** Two of the researchers were on hand to ensure that participants' additional comments were accurately collected. Results were analyzed using Epi- Info. The c2 (with Yates' correction) and the Independent Samples *T* -tests were used to compare the demographic details of participants and those who declined to take part. Comparisons of the views of smokers and non-smokers were made using Fisher's exact test. Additional interview material from the notes were transcribed and subjected to a basic content analysis. **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding smoking A. Reasons for/triggers of smoking: Psychological, environmental, and neurological factors "*It's [smoking] therapeutic for us. The nurse calms you down having a one to one in the smoke room."* *"It helps break down barriers."* Patients views, attitudes and perceptions regarding making a quit attempt A. Perceived barriers to making a quit attempt	**Limitations identified by author:** Low participation rate. Participants were not entirely representative of the patient population, difficulty recruiting older men and smokers. The study setting is in the independent sector, cannot necessarily be generalized to the National Health Service. **Limitations identified by team:** None identified. **Evidence gaps and/or recommendations for future research:** None indentified. **Source of funding:** Not reported.

		Hosptial, Northampton, England.	B. Perceived facilitators to making a quit attempt Patients views, attitudes and perceptions regarding successfully quitting B. Perceived facilitators to successfully quitting	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Dickerson **Year:** 2011 **Quality score:** +	**What was/were the research questions:** To better understand the experiences of persons with serious mental illnesses who have quit smoking – motivation to quit and strategies used, willingness to assist strategies used, willingness to assist peers in smoking cessation **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Structured interviews **By whom:** Not reported **What setting(s):** Community **When:** Not reported	**What populations where the sample recruited from:** Mental health agencies that serve adults with serious mental illnesses, psychiatric rehabilitation programmes, research centre for schizophrenia, USA **How were they recruited:** Convenience sample, solicited from announcements at sites **How many participants were recruited:** 78 **Were there specific exclusion critera:** Currently an inpatient, inability to engage in give and take of verbal communication **Were there specific inclusion criteria:** Former smokers with serious mental illnesses who had been abstinent for at least 4 months, at least 18	**Brief description of method and process of analysis:** Not reported **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding making a quit attempt C. Perceived facilitators to making a quit attempt "*I got fed up with it [smoking]. It causes lung cancer*", *"I'd rather quit now than when I die. It's a nasty, dirty habit."* "*I had a bad cough and took a day off from smoking. I never smoked since."* Patients views, attitudes and perceptions regarding successfully quitting B. Perceived facilitators to successfully quitting	**Limitations identified by author:** Convenience sample, no direct comparison groups of quitters who were not mental health consumers **Limitations identified by team:** Lack of details regarding methods and analysis **Evidence gaps and/or recommendations for future research:** Used to educate both clinicians and consumers that quitting is possible and to change pessimistic beliefs about the potential of consumers to quit smoking **Source of funding:** Maryland Quitting Use and Initiation of Tobacco (MDQuit) Research centre

		years of age, receiving outpatient mental health services, English speaking		

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Edmonds **Year:** 2007 **Quality score:** ++	**What was/were the research questions:** i) Evaluation of training package for mental health workers to deliver one to one stop smoking support to people with mental health illnesses ii) Exploration of the experiences of people with mental health problems who receive one to one stop smoking support iii) **What theoretical approach does the study take (if specified):** Not specified **How were the data collected:** **What method(s):** Semi-structured interviews **By whom:** Researchers **What setting(s):** Outpatients **When:** October 2005 to June 2006	**What populations were the sample recruited from:** Mental health service users accessing UK based specialised one to one stop smoking support (West Surrey Stop Smoking Service) **How were they recruited:** Not reported **How many participants were recruited:** 20 users, 40 workers **Were there specific exclusion critera:** Users that experienced deterioration in their mental health following quit programme **Were there specific inclusion criteria:** Users that were ready to start a quit programme	**Brief description of method and process of analysis:** Analysed using inductive thematic networks **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes, and perceptions regarding smoking A. Reasons for/triggers of smoking: Psychological, environmental, and neurological factors *"Yeah, because it was my thing that I did was smoked…It was like a bereavement, it was… big hole, big, big hole."* Patients views, attitudes and perceptions regarding making a quit attempt B. Perceived facilitators to making a quit attempt Patients views, attitudes and perceptions regarding successfully quitting A. Perceived barriers of successfully quitting *"I don't do well in big groups. I get a little bit pensive. I wouldn't have been able to handle that. Too much stress for nothing. Which would make me want to go outside for a cigarette."* *"I did have this little picture of going into one of these groups, where you all sit around, a bit like*	**Limitations identified by author:** None reported **Limitations identified by team:** None reported **Evidence gaps and/or recommendations for future research:** Stop Smokng Services should work with primary care and mental health professionals to ensure mental health users are routinely offered access to Stop Smoking Services **Source of funding:** Not reported

			AA [Alcoholics Anonymous]. I did have a thought that I might end up in one of those." B. Perceived facilitators to successfully quitting "*It's got to be a one to one for you to be able to get it through your head."* "*It all needs to be all free option, as many options as possible, and people to choose."* "*It felt informal, not like you were going to a clinic or anything like that or any kind of rehab. It is like a homely environment.*" "*Going to a group or the hospital or somewhere like that… would have been a bit anxious about that."* "*…the home environment is much better…"* C. Outcomes following successfully quitting *"I feel really proud of myself."* "*Found we sat and talked quite a lot a more… I'd say it has been positive experience.*" Staff attitudes towards smoking cessation in patients A. Negative beliefs regarding quitting *"Many have the attitude that people with mental health problems 'can't stop smoking', 'can't give up', will 'never be able to stop.'"*	

			C. Influence of staff smoking status on patients Staff skills and abilities A. Confidence inproviding smoking cessation support B. Adequacy of training Staff perceptions of systems and policies A. Priority of smoking cessation B. Time and other resources	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Essenmacher **Year:** 2008 **Quality score:** +	**What was/were the research questions:** Determine staff's characterisitics that are associated with attitudes about providing cessation services to veteran patients with psychiatric illness. Seek suggestions and inslight from staff about what would be important to include in a tobacco cessation program. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Cross sectional survey and interviews. **By whom:** Researchers. **What setting(s):** Inpatient **When:** No reported.	**What populations where the sample recruited from:** Staff members at a primary psychiatric veterans affairs (VA) hospital. **How were they recruited:** Surveys were handed out to staff directly during shift reports or left for day and midnight shift staff to complete and collected within a short time. SA convenience subsample of eight of the surveyed staff members were interviewed. **How many participants were recruited:** Survey n=150 (97%) and 8 staff members were interviewed. **Were there specific exclusion critera:** None reported.	**Brief description of method and process of analysis:** Means and frequencies were conducted for all variables. Bivariate analyses were conducted using $\chi 2$ or Fisher's exact tests to determine associations between the independent variables of staff's characteristics and to compare staff's characteristics to the six tobacco cessation service delivery dependent variables. Spearman correlations were used to assess possible collinearity between the independent variable staff's characteristics. After reviewing the bivariate analyses and any collinearity between the independent variables, multivariate analyses were conducted to determine the association between education, staff position, and smoking status and staff's responses to the six tobacco cessation service delivery variables. The transcripts of staff interviews were reviewed by two researchers. Common themes that would be useful in developing an inpatient cessation program at the VA were noted. Qualitative data from the interviews were used to further explain the quantitative data from the survey results. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes and beliefs regarding smoking in	**Limitations identified by author:** Cross sectional and does not take into account changes over time. Is not a random sample and is therefore not a representative sample. Responses to face-to-face interviews may have been biased due to the provision of socially desirable answers. The sample size was small, limiting the types of analyses that could be conducted. **Limitations identified by team:** None identified. **Evidence gaps and/or recommendations for future research:** The delivery of cessation services in VA psychiatric hospitals may be improved by addressing smoking among staff caregivers and

		Were there specific inclusion criteria: Both clinical and non clinical staff were surveyed.	patients A. Smoking as a personal choice Staff attitudes towards smoking cessation in patients A. Negative beliefs regarding quitting B. Influence of staff smoking status on patients D. Roles and responsibilities of staff in quitting Perceived barriers and facilitators to quitting in patients A. Motivation, nicotine dependence, psycholosocial, and environmental factors Staff skills and abilities A. Confidence inproviding smoking cessation support B. Adequacy of training Staff perceptions of systems and policies B. Time and other resources Staff perceptions regarding interventions for smoking cessation in patients D. Information and accessibility of support for patients	by educating caregivers about the importance of providing cessation services. Environmental and cultural changes may also be needed to improve cessation rates among veterans serviced by VA psychiatric facilities. **Source of funding:** The Department of Veteran Affairs.

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Goldberg **Year:** 1996 **Quality score:** ++	**What was/were the research questions:** To identify reasons why persons with mental illness smoke, why it is hard to quit, and their beliefs about the type of support required to facilitate change in their smoking behaviour **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Survey and focus groups **By whom:** Not reported **What setting(s):** Community **When:** Not reported	**What populations where the sample recruited from:** Patients with schizophrenia from psychiatric rehabilitation programme **How were they recruited:** Identified from psychiatric rehabilitation programme **How many participants were recruited:** 105 (93% response rate) **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Not reported	**Brief description of method and process of analysis:** Qualitative data were coded to identify emergent themes, which were then enumerated to identify response trends. **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding smoking A. Reasons for/triggers of smoking: Psychological, environmental, and neurological factors "*I know all the negative things that smoking does. If I had something to look forward to during the day, activities would keep my mind of the cigarettes.*" "*It is the only thing I do that I really enjoy.*" "*[It's a] cheap thrill – [the] longer you go without, the more you enjoy it when you have it.*" "*The voices I hear make me nervous, so I smoke to relax,*" and "*Smoking and worry things are connected …. I use smoking to relax from the worry things, can't get rid of the worry things, can't stop smoking.*" Patients views, attitudes and perceptions regarding making a quit attempt A. Perceived barriers to making a quit attempt *"It is your best friend… when I tried to quit, my*	**Limitations identified by author:** None reported **Limitations identified by team:** Potential for lack of generalisibility **Evidence gaps and/or recommendations for future research:** Develop smoking cessation services which are specialised to the needs of patients with schziophrenia **Source of funding:** Not reported

			thoughts go crazy and I start thinking about smoking cigarettes all the time." "*After I have a cigarette, I say to myself, I've got to stop smoking, but it doesn't materialize. It's hard because it becomes a routine.*" "*Even if my live-in boyfriend asked me to quit or move out, I'd move out*" "*Even if the price went way up, I'd give up other things to still smoke*" B. Perceived facilitators to making a quit attempt "*Looking at a picture of blackened lungs and people who could only breathe with a respirator."* "*When I feel my health is going bad – it doesn't bother my throat much [now] and I smoke a lot.*" "*If I was told by my doctor that I couldn't smoke anymore or I'd die.*" "*[I] didn't want to be the perfect picture of a psychiatric patient – they all smoke.*" Patients views, attitudes and perceptions regarding successfully quitting D. Suggested interventions for smoking Cessation	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Green **Year:** 2005 **Quality score:** +	**What was/were the research questions:** To examine the attitudes of people with mental illness toward smoking reduction and cessation **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Focus groups **By whom:** Not reported **What setting(s):** Community **When:** October to November 2001	**What populations where the sample recruited from:** Various psychiatric outpatient programmes, Winnipeg, Canada **How were they recruited:** Participants invited via posted letter **How many participants were recruited:** 21 (66% of those completing questionnaire) **Were there specific exclusion critera:** Inability to participate in group process due to poorly controlled psychiatric symptoms **Were there specific inclusion criteria:** Self-reported diagnosis of mental illness, aged 18+ years, treated in psychiatric outpatient department, able to understand English, able give informed consent	**Brief description of method and process of analysis:** Not reported **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding smoking A. Reasons for/triggers of smoking: Psychological, environmental, and neurological factors "*It [smoking] relieves boredom.*" "*Stress makes me smoke more.*" "*If you smoke, you can join the gang.*" Patients views, attitudes and perceptions regarding making a quit attempt A. Perceive barriers to making a quit attempt "*[You will] stop towards the end of [your] life.*"	**Limitations identified by author:** Small sample size, potential for selection bias due to honorarium **Limitations identified by team:** Analysis details not reported **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Nursing grant from the Health Sciences Centre Foundation

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Himelhoch **Year:** 2003 **Quality score:** +	**What was/were the research questions:** To determine how often psychiatrists offer smoking cessation counselling to their patients who smoke, and to determine which factors are independently associated with a psychiatrist offering smoking cessation counselling to their patients who smoke **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Cross-sectional analysis of National Ambulatory Medical Care Survey **By whom:** National Center for Health Statistics **What setting(s):** Community	**What populations where the sample recruited from:** Psychiatric patients under the care of physicians. **How were they recruited:** Systematic sampling, mainly patients under the care of non-academic physicians. National probability sample survey conducted by the National Center for Health Statistics, annually collects information **How many participants were recruited:** 573 psychiatrists (6400 visits to psychiatrists in patients who smoked). Response rate not reported. **Were there specific exclusion critera:** The survey does not include physician visits in federally based and hospital-based outpatients settings	**Brief description of method and process of analysis:** Physicians completed a one page form for a sample of office visits. Chi-squared tests and logistic regression analysis. Analysis based on un-weighted data. Assessed for presence of clustering **Key themes (with illustrative quotes if available) relevant to this review:**	**Limitations identified by author:** Old time period, current interventions were not available, lack of information regarding length of time and number of cigarettes smoked per day by patients, couldn't assess the effect of visit acuity on the receipt of smoking cessation counselling, small sample size **Limitations identified by team:** No further limitations identified **Evidence gaps and/or recommendations for future research:** Interventions to increase awareness of smoking cessation counselling by psychiatrists may be warranted **Source of funding:** Robert Wood Johnson Foundation

	When: A random 1 week period between 1992 and 1996 for each service	**Were there specific inclusion criteria:** Aged 18+ years, psychiatric diagnosies based on ICD-9 codes (psychotic disorders, depressive disorders, bipolar affective disorders, anxiety disorders, and substance abuse disorders)		

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Johnson **Year:** 2009 **Quality score:** +	**What was/were the research questions:** To describe community base mental health care providers attitudes about tobacco use and confidence in providing effective smoking cessation interventions, personal smoking status, incorporation of smoking cessation interventions in practice **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Survey **By whom:** Not reported **What setting(s):** Community **When:** February to April 2006	**What populations where the sample recruited from:** Mental health providers employed by Vancouver Community mental health services **How were they recruited:** Not reported **How many participants were recruited:** 282 (approx 38% response rate) **Were there specific exclusion critera:** Adminsitratros and other non-direct care or specialised population service providers (e.g. geriatric, child, or adolescent services, emergency services) **Were there specific inclusion criteria:** Paid employees who provided direct services, including support and programming, to persons with severe mental illness living in the community	**Brief description of method and process of analysis:** Descriptive analyses, chi-squared anmd t-tests, multiple logistic regression **Key themes (with illustrative quotes if available) relevant to this review:**	**Limitations identified by author:** Low response rate **Limitations identified by team:** No further limitations identified **Evidence gaps and/or recommendations for future research:** Not reported **Source of funding:** National Cancer Institute of Canada, Centre for Addictions Research of BC, Michael Smith Foundation for Health Research Senior Scholar Award

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Kelly **Year:** 2010 **Quality score:** -	**What was/were the research questions:** To examine the views and attitudes regarding health risks of cigarette smoking and motivation for cessation in smokers with schizophrenia and smokers without a psychotic disorder **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Case-control study **By whom:** Not reported **What setting(s):** Not reported **When:** Not reported	**What populations where the sample recruited from:** Not reported, but based in the USA **How were they recruited:** Not reported **How many participants were recruited:** 100 cases and 100 controls (response rate not reported) **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Smokers who were not currently trying to quit smoking , aged 18-65 years. Cases diagnosed with schizophrenia, healthy controls	**Brief description of method and process of analysis:** No methods or analysis details reported **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding making a quit attempt A. Perceived barriers to making a quit attempt B. Perceived facilitators to making a quit attempt Patients views, attitudes and perceptions regarding successfully quitting D. Suggested interventions for smoking cessation	**Limitations identified by author:** None reported **Limitations identified by team:** Lack of information regarding methods and analysis reported in the abstract (from poster presentation) **Evidence gaps and/or recommendations for future research:** Not reported **Source of funding:** Not reported

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Landow **Year:** 1995 **Quality score:** -	**What was/were the research questions:** To learn how physicians approach the problem of high smoking rates in psychiatric populations **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Survey **By whom:** Not reported **What setting(s):** Inpatient **When:** Not reported	**What populations where the sample recruited from:** Chairs of US academic psychiatry departments, USA **How were they recruited:** Not reported **How many participants were recruited:** 74 (58% response rate) **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Not reported	**Brief description of method and process of analysis:** Not reported **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes towards smoking cessation in patients E. Perceived impact of quitting on mental health	**Limitations identified by author:** None reported **Limitations identified by team:** Lack of methods and analysis, low response rate (presented in abstract form) **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Not reported

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Lawn **Year:** 2002 **Quality score:** ++	**What was/were the research questions:** Aims to describe the experiences of mental health clients as they relate to smoking behaviour, the relationship of smoking behaviour to the course of their mental illness and its management, and to their attempts to quit smoking. **What theoretical approach does the study take (if specified):** Grounded theory approach. **How were the data collected:** Interviews either at participants home or in a secure setting due to nature of illness. **What method(s):** Semi structured open ended interviews. **By whom:** Researchers	**What populations where the sample recruited from:** Community based psychiatric population in Adelaide, Australia. **How were they recruited:** The method of sampling used throughout the study was 'purposive' in that Key Workers (case managers), following a thorough understanding of the selection criteria **How many participants were recruited:** 24 participants. **Were there specific exclusion critera:** **Were there specific inclusion criteria:** (a) the person was a current smoker and met the addicted smoker criteria set out by the FTND, achieving a score of six or more(b) the person be a current client of the service; (c) the person's	**Brief description of method and process of analysis:** All interviews were audiotaped for accuracy and transcribed verbatim except where participants requested that taping not done, usually for reasons related to delusions and paranoia about the taping process. Two participants chose this option and extensive notes were made of their responses during the interview. The researcher made extensive field notes and memos based on spoken and observed information from participants, as well as notes about consultations with experts in the fields of mental health and drug and alcohol abuse. A reflective journal was also kept throughout the course of the study. Triangulating data sources by drawing from interviews, memos, observations, supervision discussions, consultation with experts, feedback from presentations and from participants. Qualitative thematic analysis of the transcribed interviews followed the Grounded Theory process of constant comparative analysis. Initially, transcribed interviews were read and summary memos written. The interviews and memos were then read and re-read, and assigned first-level (open) codes. At this stage intercoder reliability testing was performed with one of the researcher's supervisors (RGP) to enhance credibility of coding. Two transcribed interviews from each of the four diagnostic groups were selected at random and codes were	**Limitations identified by author:** Due to the small size and method of sampling used, the findings of this study cannot be generalised to the total population using community mental health services, nor can reliable generalisations be made based on and comparing diagnostic subgroups. **Limitations identified by team:** None identified. **Evidence gaps and/or recommendations for future research:** These findings also suggest that there may be differences in smoking needs and patterns, according to the person's psychiatric diagnosis and that it would be worthwhile to take this into account when attempting to help people to quit, or cut. **Source of funding:** None reported.

	What setting(s): Community **When:** Over a period of 4 months.	mental state was stable at the time of interview, this being confirmed by reference to the person's case notes, key workers and doctors; (d) participants could be at any stage of the change process according to Prochaska and DiClemente's (1984) Transtheoretical Model of Change; and (e) the person's diagnosis was determined, accurate, and uncomplicated by a secondary (axis two) diagnosis of personality disorder, except where this was the criterion.	compared. More than 80% agreement was found between the researcher's coding and the supervisor's coding following manual counting. These codes were then clustered into categories with accompanying descriptive and axial coding notes to explain the decision-making processes followed by the researcher. Inductive and deductive questioning occurred throughout this process, in the search for causal links and unique data. These categories were then clustered into themes allowing more abstraction and checking of negative cases. Three column logic diagrams were used to assist the coding process (Theme, Transcript, Theoretical Note/Link). **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding smoking A. Reasons for/triggers of smoking: psychological, environmental, and neurological factors *"I've been trying to find the word for my smoking. It's sort of condolence. Like, I don't have much in my life, and smoking's been with me for a long time…When you don't have much in your life, it's a bit hard giving up something so familiar… And I think 'Well, why do I have to quit? I deserve something'."* "*Who else have I got? They're always there. They're good friends and they don't criticise you."* "*When I'm well, I can do without a smoke for ages. I can stop smoking just like that! When I'm unwell, I'll smoke my head off."* "*You have to keep it a level up… like it's*	

		something your brain and body's doing automatically to let you know that your nicotine level is dropping… it's a physical thing of actually needing it." B. Priority of smoking "*The first time when I had no money… I used to go around the street looking for butts… I don't know where or who they came from but I'd unroll them and join them all up again in one…. I've been that bad…. I would have done anything for one at the time.*" C. Cigarettes as a currency and mechanism of control "*Sometimes the smokes were almost used like blackmail so that, if you didn't do the right thing, the cigarettes were denied you. So if you're someone who usually smokes a cigarette every twenty minutes or so, you'd be frantic. It takes away your sense of being a person.*" Patients views, attitudes and perceptions regarding making a quit attempt A. Perceived barriers to making a quit attempt "*I'm just not sure what else there is. What would I do with myself? I don't expect my current situation to be any different…. Seems like I've got an illness, like, it would be good to go wouldn't it. I wouldn't have the illness no more… Even if I did give up smoking, I've still got schizophrenia, haven't I?*" B. Perceived facilitators to making a quit attempt	

			"I'd like them to take me to hospital for 3 to 4 days and tie me down and give me a sleeping drug for that time and I'd probably wake up and not want a smoke… To quit I think I'd need the magic pill." Patients views, attitudes, and perceptions regarding successfully quitting A. Perceived barriers of successfully quitting D. Suggested interventions for smoking cessation Staff attitudes towards smoking cessation in patients C. Influence of staff smoking status on patients	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Lawn **Year:** 2004 **Quality score:** ++	**What was/were the research questions:** To test the generalisbility of results of the study by comparing two settings in Australia **What theoretical approach does the study take (if specified):** Ethnographic **How were the data collected:** **What method(s):** Participant observation and interviews with staff and inpatients **By whom:** Researchers **What setting(s):** Inpatient **When:** Over two periods initially over 6 monhs between 2000 and early 2001	**What populations where the sample recruited from:** Stand alone psychiatric hospitals within metropolitan South Australia and metropolitan Queensland **How were they recruited:** Not reported **How many participants were recruited:** South Australia – 350 inpatients Queensland – 150 inpatients **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Not reported	**Brief description of method and process of analysis:** Visited wards several times at random for 3 to 5 hours at various times during the day and evening, Monday to Sunday. Ceased further visits when repetition of patterns of behaviour and observation of environmental aspect occurred four or more times. 43 visits made in total. Data collection and analysis occurred simultaneously during the initial research using the constant comparative method of checking and cross-referencing the data from each observation period. Extensive journal notes were kept, recording observations, interactions, and reflections from each setting and each visit, either as the settings were being observed or as soon as possible after this took place. Standard data observation sheets were used, sheets ordered chronologically so that all data pertaining to each setting could be read and re-read several times, reflected upon and coded for recurrent themes and patter and any leads were followed-up. An independent psychiatrist acted as a second coder for the data, regular meetings occurred with an independent auditor throughout the participant observation period **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding smoking A. Reasons for/triggers of smoking: Psychological, environmental, and	**Limitations identified by author:** None reported **Limitations identified by team:** None identified **Evidence gaps and/or recommendations for future research:** Not reported **Source of funding:** Flinder Mental Health/FMC, Cancer Council of South Australia

			neurological factors "*It was just good being around other people but they all used to smoke, so I just joined in. It was a real social thing. Some of the nurses used to come out and have a smoke and talk to you. They'd be talking to you just as a friend, not like when you were talking to the doctor.*" C. Cigarettes as a form of currency and mechanism of control "*When you're locked up and treated like animals in a cage, you choose to smoke because there's not much else you can choose. If you fight back, they throw you in seclusion. When other things are so restricted on you, smoking is one thing you can decide to do to nark them, to show them that they're not totally controlling you… You feel very powerless."* "*Occasionally we have entrepreneurial people who charge considerably more than the cost of cigarettes, or they'll actually use cigarettes in order to get sexual favours."* Patients views, attitudes and perceptions regarding successfully quitting B. Perceived facilitators to successfully quitting Staff attitudes and beliefs regarding smoking in patients A. Smoking as a personal choice "*In my hearts of hearts, with patients with schizophrenia, I feel that they haven't got much left for them, so good luck to them. If they want to smoke, let them."*	

			C. Smoking as a shared activity to build Rapport "*Part of working with really difficult clients is trying to find an entry point where you can develop rapport with them. And what was more easy than sitting around with them and having a smoke."* D. Cigarettes as a mechanism of control "*If they didn't smoke, they wouldn't come back to the door every half-an-hour either. There's something about having a closed door between us that makes a difference. It's a real power thing… Staff seems to adopt a certain mentality of control just because of the environment. It's very easy to give people cigarette. It's easier than not giving them."* "*From both a nurses and client management perspective, if you can keep the ward running smoothly and minimising the amount of aggression, by allowing them to smoke, then allowing them to smoke facilitates that. By all means, I'd rather have a smoother running ward than go home with a broken arm.*" Staff attitudes towards smoking cessation in patients A. Negative beliefs regarding quitting E. Perceived impact of quitting on mental health Perceived barriers and facilitators to quitting in patients A. Motivation, nicotine dependence, psycholosocial, and environmental	

			factors "*In the locked ward I don't think there's much in the way of one-to-one therapeutic activity that happens. It's kind of, 'Let's wait for the medication to work'. There's just nothing to do. The only normal thing to do at the time is to smoke*"	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Lawn **Year:** 2006 **Quality score:** ++	**What was/were the research questions:** To investigate the ethical thinking of a small sample of nurses with regard to smoking by mentally ill patients **What theoretical approach does the study take (if specified):** Grounded theory approach **How were the data collected:** **What method(s):** Semi-structured inteviews **By whom:** Not reported **What setting(s):** Inpatient and community **When:** Not reported	**What populations where the sample recruited from:** Nursing staff of a public, government-funded mental health service, Australia **How were they recruited:** Purposive sample **How many participants were recruited:** 7 **Were there specific exclusion critera:** **Were there specific inclusion criteria:** Nurses willing to participate, qualification as registered nurse, at least 10 years of professional experience	**Brief description of method and process of analysis:** Comprehensive approach towards data collection, including supporting observational, feedback seminars, and audit trial. Thematic analysis using constant comparative **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes and beliefs regarding smoking in patients A. Smoking as a personal choice "*I just think everyone has got the right to choose to do what they want to do…. They were smoking before they were detained so what rights have we to stop them from smoking once they're detained."* "*When they're [on the locked wards], they've got so little anyway, that's one of the pleasures that they've got."* B. Smoking as a means of self-medication C. Smoking as a shared activity to build Rapport D. Cigarettes as a mechanism of control "*If you wanted the patient to do something, you could give them a cigarette and they'd probably do it. In fact, I can remember my first ward, the charge sister saying, 'Go and run this errand and I'll give you a cigarette. Go and make your bed and I'll give you a cigarette…' It was how you go*	**Limitations identified by author:** None reported **Limitations identified by team:** Very small sample size **Evidence gaps and/or recommendations for future research:** Not reported **Source of funding:** Not reported

			things done." "*I accept that [smoking] affects their health in a derogatory way; however, I think the greater priority is the immediate client and staff safety. And if withholding cigarettes is going to increase client irritability and the potential for aggression and violence, I think the long-term decline in their health is the lesser of the two evils, because of the potential that the immediate violence can cause."*	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Lubman **Year:** 2007 **Quality score:** -	**What was/were the research questions:** Beliefs of Psychiatrists and general practitioners in the helpfulness of cutting down on smoking cigarettes for young people with mental disorders. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Questionnaire survey. **By whom:** Not reported. **What setting(s):** Community **When:** September 2006 – January 2007.	**What populations where the sample recruited from:** Psychiatrists and general practitioners in Australia. **How were they recruited:** Not reported. **How many participants were recruited:** Approx. 598/1710 (35%) of psychiatrists. 480/2000 (24%) of GPs. **Were there specific exclusion critera:** Not reported. **Were there specific inclusion criteria:** Not reported.	**Brief description of method and process of analysis:** Not reported. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes towards smoking cessation in patients A. Negative beliefs regarding quitting	**Limitations identified by author:** None indentified. **Limitations identified by team:** Very low response rate, limited methods and analysis reported, low relevance to the questions of the review **Evidence gaps and/or recommendations for future research:** None indentified. **Source of funding:** Not reported.

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Lucksted **Year:** 2000 **Quality score:** ++	**What was/were the research questions:** Explored the perceived advantages and disadvantages of tobacco smoking and quitting among clients in psychosocial rehabilitation programs. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **Focus groups were held at the program site, one researcher guided the discussions, second operated the tpe recorder, took themantic notes and acted as a secondary facilitator. Sessions lasted 60-70 minutes.** **What method(s):** Focus groups **By whom:** Not reported **What setting(s):**	**What populations where the sample recruited from:** Persons attending mental health programs. **How were they recruited:** Staff posted sign up sheets and also individually invited clients they know had a particular interest in the topic. **How many participants were recruited:** 40 participants. **Were there specific exclusion critera:** None reported. **Were there specific inclusion criteria:** Had to be clients of the program, willing to take part and able to give informed consent.	**Brief description of method and process of analysis:** After each group, the audiotape was transcribed, and the transcript was checked against the tape. During transcription and correction, personal names and identifying details were removed or replaced by pseudonyms. The transcripts were then subjected to thematic analysis, in which a pair of the researchers read each transcript independently and noted important potential answers to the guiding global question, "What are the important issues regarding smoking or not smoking for these participants?" The pair then compared notations for each transcript and resolved differences through discussion until they reached a consensus coding for each group's transcript. The codes for the five group transcripts were then compared and discussed until the researchers agreed on an overall, comprehensive outline of issue categories across all groups. The five transcripts were then recoded using this final consensus outline. In addition, as we proceeded, similarities and differences were noted, along with unusual, common, and emphasized issues. In all stages of analysis we focused on capturing a wide range of ideas and experiences rather than converging on a few. **Key themes (with illustrative quotes if available) relevant to this review:**	**Limitations identified by author:** Small and non representive sample. **Limitations identified by team:** None identified. **Evidence gaps and/or recommendations for future research:** None identified. **Source of funding:** Not reported.

	Community **When:** Summer of 1999.		Patients views, attitudes and perceptions regarding smoking A. Reasons for/triggers of smoking: Psychological, environmental, and neurological factors *"[Patient reported the staff member told them] You have so few pleasures in your life, hold on to those you do have, including smoking."* "*If you're going through a rough time, [mental] illness-wise… and you're getting an enormous amount of activity in your brain, and you just want to take a break, take five, you have a cigarette, and …. It helps focus you, calms your thinking.*" C. Cigarettes as a currency an mechanism of control Patients views, attitudes and perceptions regarding making a quit attempt A. Perceived barriers to making a quit attempt "*You have so many troubles, why worry about this one too?"* *"It would be too stressful [to quit]."* B. Perceived facilitators to making a quit attempt	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: McNally **Year:** 2010 **Quality score:** +	**What was/were the research questions:** To examine whether smoking cessation services are following guidance on delivery of services to patients with mental health illness **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Survey with semi-structured interviews **By whom:** Not reported **What setting(s):** Community **When:** Not reported	**What populations where the sample recruited from:** Service managers or senior staff nominated at mental health leads of all of the NHS Stop Smoking Services in London, UK **How were they recruited:** Initial email and follow-up telephone call **How many participants were recruited:** 27 (93% response rate) **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Not reported	**Brief description of method and process of analysis:** Basic descriptive statistics and thematic analysis of transcribed responses to open questions **Key themes (with illustrative quotes if available) relevant to this review:** Staff perceptions of systems and policies A. Priority of smoking cessation	**Limitations identified by author:** Not reported **Limitations identified by team:** Small sample size though high response rate **Evidence gaps and/or recommendations for future research:** To examine ways in which appropriate mental health screening and liaison with mental health service providers can be best incorporated into the routine operation of NHS Stop Smoking Services **Source of funding:** London Development Centre, part of Commissioning Support for London

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Mikhailovich **Year:** 2008 **Quality score:** -	**What was/were the research questions:** An evaluation of a smoking cessation program 1) To examine the value of NRT within the programme. 2) To identify changes to behaviour, wellbeing and other factors associated with the health of participants. 3) To document programme factors and strategies that contributed towards programme success **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Document analysis, Pre- and postintervention data	**What populations where the sample recruited from:** Mental health service operated by a local government health department offering services for people with moderate to severe mental illness. **How were they recruited:** Not reported **How many participants were recruited:** Semistructured interviews with key informant, n= 5. Narrative interview with program participant, n=6. **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Not reported	**Brief description of method and process of analysis:** *Document analysis* - The analysis included content reviews of all program documentation, original funding applications, progress reports and data collection instruments. *Pre- and postintervention data collection.* Retrospective post intervention data was collected for participants in the 2004–2005 cohort at program completion and at 6 months postintervention. In 2006 pre- and postintervention data was collected from program participants. *Semistructured interviews with key informants* - were taped and transcribed. *Narrative interview with program participants* – were taped and transcribed **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding making a quit attempt A. Perceived barriers to making a quit attempt Patients views, attitudes and perceptions regarding successfully quitting A. Perceived barriers of successfully quitting C. Outcomes following successfully quitting	**Limitations identified by author:** None identified. **Limitations identified by team:** Lack of detail regarding settings, marginal relevance to review questions, lacks generalisability to other services, data analysis unclear in places, demogrpahics of respondents not reportd **Evidence gaps and/or recommendations for future research:** An evaluation of the Cancer Council ACT under more controlled conditions. **Source of funding:** Not reported.

	collection, semistructured interviews with key informants, narrative interview with program participants (only drawn from people in drug and alcohol services). **By whom:** Not reported. **What setting(s):** Inpatients and community services. **When:** Not reported.			

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Morris **Year:** 2009 **Quality score:** +	**What was/were the research questions:** The objective of this study was to qualitatively understand the factors that impede and support tobacco cessation efforts from the perspectives of both community mental health patients and providers. The findings will be utilized to adapt evidence-based tobacco cessation interventions to meet the unique physiological, psychological, and social challenges facing persons with mental illnesses. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Focus groups	**What populations where the sample recruited from:** Persons with psychiatric disorders, mental health clinicians, and community mental health administrators. The focus groups included participants representing both urban and rural regions in Colorado's public mental health system. **How were they recruited:** Participants were recruited via community flyers, internet, and direct communication. Each participant received $15 for the hour-long group. **How many participants were recruited:** 62 mental health consumers participated **Were there specific exclusion critera:** None identified.	**Brief description of method and process of analysis:** Focus groups were digitally recorded for later transcription. NVivo 7 qualitative data analysis software. Used an editing process of analysis which encourages interpretation of the data using a team approach. Through an iterative process, performed thematic audit to track code usage across transcripts and examine consistency in application of codes by different coders. Each of four team members initially read and coded the data. Regular consensus meetings were used to create the codebook of themes and definitions. **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding smoking A. Reasons for/triggers of smoking: Psychological, environmental, and neurological factors "*Give me something to occupy my time. There is nothing to do….except smoke, sleep, and shower.*" "*I more or less became a smoker because I was told it would help me with my illness. I was taught more about it helping with my illness than I was about cancer and stuff like that."* Patients views, attitudes and perceptions	**Limitations identified by author:** Limited generalizability to other populations or settings. Used a convenience sample, and did not use probability or stratified sampling procedures. **Limitations identified by team:** None identified. **Evidence gaps and/or recommendations for future research:** This qualitative exploration suggests that ongoing study is needed to determine the most effective tobacco cessation strategies for persons with mental illnesses **Source of funding:** Not reported.

	By whom: Not reported. **What setting(s):** Community **When:** Not reported.	**Were there specific inclusion criteria:** Over 18 years of age. Cognitively able to participate in the discussion and be able to provide consent.	regarding making a quit attempt A. Perceived barriers to making a quit attempt *"They [mental health providers] have to not smoke or they're not a good example for me. If they smoke, they've got nothing to tell me."* B. Perceived facilitators to making a quit attempt Patients views, attitudes and perceptions regarding successfully quitting B. Perceived facilitators to successfully quitting "*…maybe a peer advocate, maybe somebody that's smoked and quit smoking and they have ideas of how they dealt with stress at that time and how they deal with it now."* *"I think support groups would be helpful. The more people that are trying to quit you can feed off each other's need to quit, or motivation to quit."* Staff attitudes and beliefs regarding smoking in patients A. Smoking as a personal choice "*They [mental health consumers] don't care how much they spend on cigarettes. Their cigarettes are so important to them, it doesn't matter."* D. Cigarettes as a mechanism of control Staff attitudes towards smoking cessation in patients A. Negative beliefs regarding quitting	

			C. Influence of staff smoking status on patients "*I'm busy talking to my folks about better health maintenance overall, including smoking cessation and weight loss and exercise, and they're out there smoking with their case manager."* Perceived barriers and facilitators to quitting in patients A. Motivation, nicotine dependence, psycholosocial, and environmental factors "*If they [mental health patient] stop and their friends are still smoking, who do they hang out with?"* Staff skills and abilities B. Adequacy of training *"[Smoking is] something that you just keep coming back to. You talk about it every single time you see the consumer."* Staff perceptions of systems and policies A. Priority of smoking cessation Staff perceptions regarding interventions for smoking cessation in patients A. Perceived effectiveness and safety of interventions "*The problem is that there isn't actually evidence that it [cessation strategies] works."* C. Lack of re-imbursement	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: O'Donovan **Year:** 2009 **Quality score:** +	**What was/were the research questions:** To examine nurses' smoking prevalence and their role in smoking cessation, particularly their attitudes towards health promotion (including the hypothesis that attitudes will differ significantly between smokers and non-smokers **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Survey. **By whom:** Not reported. **What setting(s):** Inpatient. **When:** Not reported.	**What populations where the sample recruited from:** Sample of qualified nurses in a large university teaching hospital in the city of Cork, Southern Ireland. Included psychiatric and non-psychiatric specialties. **How were they recruited:** A letter of introduction, explaining the purpose of the study, assuring anonymity and confidentiality was provided to all respondents of the questionnaire. The questionnaire was distributed personally to all the applicable areas and a request was made to complete and return to a designated collection point on each ward. **How many participants were recruited:** 430 (70% response rate). **Were there specific**	**Brief description of method and process of analysis:** Data from the completed questionnaires were analysed using the Statistical Package for the Social Sciences (2000) for Windows version 13. Frequency tables and measures of central tendency (mean, median, standard deviation) were generated to explore the data using descriptive statistics. The researcher used Pearson's chi-square test for independence to explore the relationship between respondents' smoking status and attitudes towards smoking, smoking cessation and the introduction of the smoking ban in the Republic of Ireland in 2004. This test was used as the variables in question contained only categorical data. The chi-square test is used to determine if two categorical variables are related to each other, i.e. if the value of one affects the value of another. the Cramer's V statistic was generated as it is a measure of the strength of association between two categorical variables used when one or both of these variables has more than two categories; the Phi statistic is used when both variables have only two categories. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes towards smoking cessation in patients A. Postive beliefs regarding quitting Staff skills and abilities	**Limitations identified by author:** Self report survey method, providing no opportunity to expand on answers. The smaple does not fully represent the nursing population in the Repulic of Ireland as only one large teaching hospital used. **Limitations identified by team:** Low relevance to review questions **Evidence gaps and/or recommendations for future research:** None identified. **Source of funding:** Not reported.

		exclusion critera: Nurses working in certain areas of the hospital excluded as they would not be giving smoking cessation because of the acute condition of the patients. **Were there specific inclusion criteria:** None identified.	B. Adequacy of training Staff perceptions in systems and policies B. Time and other resources	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Parker **Year:** 2012 **Quality score:** +	**What was/were the research questions:** To implement a tailored tobacco dependence service in mental health settings and assess its impact, and barriers and facilitators to implementation **What theoretical approach does the study take (if specified):** Not specified **How were the data collected:** **What method(s):** Audit of clinical notes, weekly recording of barriers and facilitators **By whom:** Smoking cessation advisors **What setting(s):** Inpatient and community **When:** October 2010 to June 2011	**What populations where the sample recruited from:** Patients recruited through direct contact with advisors, inpatients and community psychiatric nurses. Additionally, community patient could also be recruited via mail-drop to all patients advertsing the service **How were they recruited:** As part of a pragmatic pilot project **How many participants were recruited:** 2038 community based patients, 4 acute and 2 rehabilitation wards containing a total of 129 beds **Were there specific exclusion critera:** Not specified **Were there specific inclusion criteria:** Eligible if smoked and wanted to address smoking. If	**Brief description of method and process of analysis:** Integrative service model in the UK's largest mental health trust. An audit of current procedures (detailing policies and information relating to treatment of smoking within patients' care pathways) was documented. Two full time mental health professionals were recruited to support patients and staff who smoked to follow a structured quit programme and assisted with reduction programmes. **Key themes (with illustrative quotes if available) relevant to this review:** Percived barriers and facilitators to quitting in patients A. Motivation, nicotine dependence, psychosocial, and environmental factors Staff perceptions regarding interventions for smoking cessation in patients A. Perceived effectiveness and safety of interventions	**Limitations identified by author:** Only used a pragmatic design as not possible to do a randomised controlled trial design. Only looked at NRT, did not consider buproprion or varenicline **Limitations identified by team:** No further limitations identified **Evidence gaps and/or recommendations for future research:** Recommended that smoking status was recorded in the community to improve service uptake and quit rates. Identified the need for research into effective relapse prevention strategies **Source of funding:** UK Centre for Tobacco Control Studies, and Department of Health

		inpatient, then also needed to be stable enough as assessed by clinical staff		

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Price **Year:** 2007a **Quality score:** -	**What was/were the research questions:** To explore psychiatrists' perceptions and practices relating to treating smoking in patients, and to examine whether these perceptions and practices varied by psychiatrists' characteristics **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Questionnaire survey **By whom:** Not reported **What setting(s):** Community **When:** Spring and Summer of 2005.	**What populations where the sample recruited from:** Mental health centers with Ohio Department of Mental Health (ODMH) certification. **How were they recruited:** The researchers conducted phone calls to all mental health centers to collect the names of at least two adult psychiatrists on staff. In some cases, where centers were small, only one name was provided by the office staff. In order to maximize the response rate a three-wave mailing procedure was used. The first wave consisted of a personalized, hand-signed cover letter explaining the intent of the study, a green-colored questionnaire in booklet format, a self-addressed stamped envelope, and a	**Brief description of method and process of analysis:** Survey data were analyzed using the SPSS 12.0 for Windows. The questionnaires were coded to reduce survey costs and duplicate responses. Descriptive statistics, including frequencies, means, standard deviations, and medians were calculated on most variables. Other data analysis included t-tests, chi-square tests, and Fisher's exact test **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes towards smoking cessation in patients A. Negative beliefs regarding quitting B. Postive beliefs regarding quitting D. Roles and responsibilities of staff in quitting Staff skills and abilities A. Confidence inproviding smoking cessation support B. Adequacy of training Staff perceptions in systems and policies B. Time and other resources Staff perceptions regarding interventions for	**Limitations identified by author:** Limited to community mental health center psychitarists only in Ohio. Internal validatly threatened by participants answering in a socially desireable way. Cross sectional, therefore cause and effect can not be drawn. The response rate was limited. **Limitations identified by team:** Potential for selection bias, low relevance to review questions **Evidence gaps and/or recommendations for future research:** None identified. **Source of funding:** Not reported.

		$1 incentive. The second wave, another questionnaire and return envelope, was sent two weeks subsequent to the first wave non-respondents. The third wave, a color-matched postcard, was sent approximately two weeks after the second wave. **How many participants were recruited:** 78 agreed to participate (53% response rate). **Were there specific exclusion critera:** Facilities with only child or adolescent psychiatrists. **Were there specific inclusion criteria:** Not reported.	smoking cessation in patients A. Perceived effectiveness and safety of interventions B. Awareness of staff of services C. Lack of re-imbursement	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Price **Year:** 2007b **Quality score:** +	**What was/were the research questions:** Practices and perceptions of smoking cessation activities among child and adolescent psychiatrists **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Questionnaire survey **By whom:** Not reported. **What setting(s):** Community **When:** Summer 2005	**What populations where the sample recruited from:** The 2003 membership list of the American Academy of Child and Adolescent Psychiatry (AACAP). As of 2003, AACAP had 6,634 members that resided within the continental United States. **How were they recruited:** This list was used to randomly select 500 subjects for the study. A four-wave mailing procedure was used. **How many participants were recruited:** 184 (47% reponse rate) **Were there specific exclusion critera:** Not eligible for the study - retired, deceased, or not currently seeing child and adolescent patients. . **Were there specific inclusion criteria:** Not reported.	**Brief description of method and process of analysis:** A series of x2 tests examined the relationships among age, sex, and practice location and placement in relationship to their stages of change. A series of t tests were calculated to examine the relationship among sex, age, and practice location and use of the 5 A`s. A series of t tests were calculated to determine the relationship between sex, age, practice location, stage in the stages of change model, and the number of barriers identified by psychiatrists. A series of Pearson product moment correlation coefficients were calculated to examine the relationships between the level of confidence and perceived preparedness of the psychiatrists for addressing smoking cessation and the number of barriers identified. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes towards smoking cessation in patients A. Negative beliefs regarding quitting D. Roles and responsibilities of staff in quitting Staff skills and abilities A. Confidence inproviding smoking cessation support B. Adequacy of training	**Limitations identified by author:** Response rate was much lower than ideal. The AACAP did not have available comprehensive demographic data (age, race/ethnicity, years in practice, or location of practice) to assess representativeness. Because of the widespread awareness of the 5 A`s as a major evidence-based protocol for smoking cessation, some psychiatrists may have felt the need to respond to some questionnaire items in a socially desirable way. The assessment of child and adolescent psychiatrists` perceptions and practices regarding smoking cessation were cross-sectional, using only one point in time to assess associations between the responses and the characteristics of the psychiatrists. Thus, this study cannot be used to draw conclusions regarding cause-and-effect

			Staff perceptions of systems and policies A. Priority of smoking cessation B. Time and other resources Staff perceptions regarding interventions for smoking cessation in patients A. Perceived effectiveness and safety of interventions C. Lack of re-imbursement	relationships between the responses and the respondents` characteristics.The variety of choices given to measure the various constructs on the closed-format questionnaire could have been a threat to the internal validity should any important alternative options not have been listed. This study was limited only to child and adolescent psychiatrists who were members of the AACAP during 2003. **Limitations identified by team:** None identified. **Evidence gaps and/or recommendations for future research:** There is a dearth of large-scale investigations into what really works, particularly among adolescents with comorbid psychiatric illnesses, to help adolescents quit smoking. **Source of funding:** Not reported.

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Prochaska **Year:** 2005 **Quality score:** +	**What was/were the research questions:** The purpose of this study was to assess the need for and interest in tobacco cessation curricula in psychiatry residency training. We surveyed psychiatry residents (staff) on their knowledge, attitudes, and behaviors regarding interventions for treating tobacco dependence in clinical practice. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Questionnaire survey **By whom:** Not reported **What setting(s):** Inpatient **When:** Not reported.	**What populations where the sample recruited from:** Residents (staff) from five psychiatry residency programs in Northern California. **How were they recruited:** Residency lists provided by program training directors defined the recruitment pool. The survey was mailed and/or emailed to the 155 identified residents. A cover letter explained the purpose of the survey and requested voluntary participation. Completion was considered consent. Nonresponders were sent a second survey. **How many participants were recruited:** 105 participants (68% response rate) **Were there specific**	**Brief description of method and process of analysis:** Descriptive analyses (means, frequencies) were used to summarize residents' survey responses. Correlations tested associations among the constructs. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes towards smoking cessation in patients C. Influence of staff smoking status on patients Staff skills and abilities A. Confidence inproviding smoking cessation support B. Adequacy of training	**Limitations identified by author:** Representativeness of the sample is unknown. **Limitations identified by team:** Medium relevance to review questions **Evidence gaps and/or recommendations for future research:** A focus on training the next generation of psychiatrists may help ensure that changes in clinical practice are achieved and that tobacco interventions are delivered to this high risk group of smokers. **Source of funding:** National Instituate of Drug Abuse San Francisco Treatment Research Centre, National Institute on Drug Abuse grants, and the National Institutes of Mental Health grant an a

		exclusion critera: Not reported. **Were there specific inclusion criteria:** Not reported.		Postdoctoral Fellowship from the Tobacco Related Disease Research Program.

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Prochaska **Year:** 2006 **Quality score:** +	**What was/were the research questions:** The purpose of the current study was to evaluate, in a national survey of residency training directors, the need for and interest in tobacco cessation training in psychiatry residency programs across the United States. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Questionnaire survey **By whom:** Not reported **What setting(s):** Inpatients. **When:** Participants were instructed to refer to the 2004-2005 academic year.	**What populations where the sample recruited from:** Training directors of psychiatry residency training programs across the United States. **How were they recruited:** Identified from the online American Medical Association's Fellowship and Residency Electronic Interactive Database (FREIDA). Surveys were emailed and/or mailed to the 181 identified psychiatry residency training directors. A cover letter explained the purpose of the survey and requested voluntary participation. Survey completion was considered consent to participate. Respondents were provided $50 gift certificates to national bookstores for personal or professional use.	**Brief description of method and process of analysis:** Descriptive analyses (means, frequencies) were used to summarize survey responses. Correlations, chi-square, and independent sample t tests were used to evaluate associations among the constructs. **Key themes (with illustrative quotes if available) relevant to this review:** Staff skills and abilities B. Adequacy of training Staff perceptions of systems and policies A. Priority of smoking cessation	**Limitations identified by author:** Reliance on self report survey and not having a full representation of the psychiatry residency training programs. **Limitations identified by team:** Response rate not optimal, medium relevance to review questions **Evidence gaps and/or recommendations for future research:** The findings of the current study demonstrate the need for and interest in tobacco cessation curricula in psychiatry residency training programs. A focus on training the next generation of psychiatrists may help ensure achievement of changes in clinical practice and delivery of tobacco

		How many participants were recruited: 114 (63% response rate). **Were there specific exclusion critera:** None reported. **Were there specific inclusion criteria:** None reported.		interventions to this high risk group of smokers. **Source of funding:** Supported by the American Cancer Society, the State of California Tobacco – Related Disease Research Program and the National Institute on Drug Abuse.

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Ratschen **Year:** 2009a **Quality score:** ++	**What was/were the research questions:** To investigate staff knowledge and attitudes relating to smoking prevalence, dependence, treatment, and the relationship between smoking and mental illness **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Survey **By whom:** Not reported **What setting(s):** Inpatient **When:** Not reported	**What populations where the sample recruited from:** Staff from 25 NHS mental health trust in City Centre catchment area of Nottingham, UK **How were they recruited:** Ward managers provided names of all clinical staff on wards, and inivitations to participate were posted out **How many participants were recruited:** 459 (68% response rate) **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Clinical staff involved in patient treatment and care	**Brief description of method and process of analysis:** Piloted questionnaire in two wards. Chi-squared and t-tests, Mann Whitney U tests, multiple logistic regression **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes and beliefs regarding smoking in patients B. Smoking as a means of self-medication Staff atttiudes towards smoking cessation inpatients D. Roles and responsibilities of staff in quitting Staff skills and abilities A. Confidence inproviding smoking cessation support B. Adequacy of training Staff perceptions in systems and policies B. Time and other resources Staff perceptions regarding interventions for smoking cessation in patients A. Perceived effectiveness and safety of interventions E. Other factors influencing the provision of smoking cessation interventions	**Limitations identified by author:** None reported **Limitations identified by team:** Potential for selection bias **Evidence gaps and/or recommendations for future research:** Deficiencies in clinician's knowledge and awareness need to be addressed **Source of funding:** Institution funded

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Ratschen **Year:** 2009b **Quality score:** +	**What was/were the research questions:** To explore the practical implications of, and problems arising from, the implementation of a comprehensive smoke-free policy **What theoretical approach does the study take (if specified):** Social-cognitive theory **How were the data collected:** **What method(s):** Semi-structured interviews **By whom:** Researcher **What setting(s):** Inpatient **When:** February to April 2008	**What populations where the sample recruited from:** Staff from two mixed gender adult mental health wards, in one local mental health trust, Nottingham, UK **How were they recruited:** Chosen by sampling within strata defined on purpose to captures full range of staff groups **How many participants were recruited:** 16 **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Not reported	**Brief description of method and process of analysis:** Interviews recorded for transcription. Analysed using thematic analysis **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes and beliefs regarding smoking in patients A. Smoking as a personal choice "*I have the impression with those patients that, often, they are really fixated on the nicotine, and they look forward to going to smoke, and it's one of their main things in life.*" Staff attitudes towards smoking cessation in patients A. Negative beliefs regarding quitting "*They're poorly and they're going through enough as it is. For them to have to stop smoking as well is even more traumatic. I always say…[] you need to get yourself right before you can stop smoking.*" B. Postive beliefs regarding quitting Perceived barriers and facilitators to quitting in patients A. Motivation, nicotine dependence, psycholosocial, and environmental factors Staff skills and abilities B. Adequacy of training	**Limitations identified by author:** Limited generalisaility **Limitations identified by team:** Small sample size **Evidence gaps and/or recommendations for future research:** Training should be provided to staff on smoking and nicotine dependence, its treatment and relationship with mental illness **Source of funding:** Institution funded

			Staff perceptions regarding interventions for smoking cessation in patients D. Information and accessibility of support for patients	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Ratschen **Year:** 2010b **Quality score:** ++	**What was/were the research questions:** To explore patients' expereineces, smoking behaviour and symptoms of nicotine withdrawal in the context of a smoke-free policy on mental health acute wards, and to identify options for the future to promote and support smoking cessation and/or reduction in these settings **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Semi-structured interviews **By whom:** Researcher **What setting(s):** Inpatient **When:** May to June 2008	**What populations where the sample recruited from:** Two acute mental health wards, Nottingham, UK **How were they recruited:** criterion sampling, recruitment continued until saturation was reached **How many participants were recruited:** 15 **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Smokers, who was capable to giving informed consent and participate in the study without this posing risks to the patients' condition or to the researcher	**Brief description of method and process of analysis:** Interview guide, contained both structured and semi-structured exploratory parts, interview guie adapted as appropriate depending on patients' condition, and to allow for flexibility where it was hard to maintain structured conversations. Shortahnd notes were taken during the interviews by assistant. Noted transcribed verbatim and analysed in a framework approach **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding smoking A. Reasons for/triggers of smoking: Psychological, environmental, and neurological factors "*If I do exercise, I don't want to smoke at all. If I could go to the gym here, I could stop immediately"* "*I see that it works as a mild sedative. It keeps me calm when I'm under stress. When I'm under stress, I use cigarettes to help me relax."* Patients views, attitudes and perceptions regarding making a quit attempt A. Perceived barriers to making a quit	**Limitations identified by author:** Sample size **Limitations identified by team:** No further limitations identified **Evidence gaps and/or recommendations for future research:** Teachable moment of hospitalisation could be used to promote health in this population, but the potential to promote smoking cessation or at least smoking reduction, in this vulnerable population is not being realised **Source of funding:** Institution funded

			attempt "*Yes, but what would be the benefit of giving up? If it's important for me to give up smoking, I have to understand the reason why I should give up smoking. My quality of life won't change if I gave up. My life is sitting watching TV, sitting around, having teas, and then sleeping. There's no motivation to give up, is there?*" B. Perceived facilitators to making a quit attempt Patients views, attitudes and perceptions regarding successfully quitting A. Perceived barriers of successfully quitting "*Last time I went on patches I smoked three times as much – I don't know why.*" *"I don't know what they've got on the market now, but I wouldn't want to take any medication, but I would try the patches or inhalers."* "*No [I would not attend a support programme on the inpatient ward] because if I wanted to give up I would…. I'm only smoking a lot because I'm in hospital."* B. Perceived facilitators to successfully quitting D. Suggested interventions for smoking cessation *"Just reduce smoking really, because I'm not bothered how much I smoke, but while I'm on the ward I do worry about it, because I haven't got*	

			much money to keep buying cigarettes and toiletries, and when I leave I have to find accommodation, and I have to sacrifice something, and sacrificing cigarettes is better than sacrificing my toiletries or food or anything."	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Sarna **Year:** 2009 **Quality score:** -	**What was/were the research questions:** To describe the frequency that psychiatric nurses' self-reported interventions to address smoking, and to explore associatios between nurses' demographics and professional charactieristcs and awareness of Tobacco Free Nurses and the 5A's **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Survey **By whom:** Not reported **What setting(s):** Inpatient **When:** Not reported	**What populations where the sample recruited from:** Nurses who provide care in a Magnet-care facility, USA **How were they recruited:** Not reported **How many participants were recruited:** 100 **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Being a nurse (registered or licensed practical), providing care for adult inpatients, self-reported working in psychiatric settings	**Brief description of method and process of analysis:** Descriptive and non-parametric statistics **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes towards smoking cessation in patients C. Influence of staff smoking status on patients	**Limitations identified by author:** Relatively small sample size, self-selection of population, reported use of interventions could not be validated, couldn't determine if the nurses work with patients with mental health or substance use disorders **Limitations identified by team:** Lack of detail regarding population sampled, limited generalisbility, errors in figures presented in tables **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** The Robert Wood Johnson Foundation and the Smoking Cessation Leadrnship Centre, University of California, San Francisco

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Scherer **Year:** Unpublished **Quality score:** +	**What was/were the research questions:** To describe the opinions of hospitalised patients, their relatives and care team members about tobacco use in the hospitalised environment and smokers' dependence level **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Survey and semi-structed interviews **By whom:** Not reported **What setting(s):** Inpatient **When:** Not reported	**What populations where the sample recruited from:** Acute psychiatric inpatients at a medical school, Brazil **How were they recruited:** Not reported **How many participants were recruited:** 25 inpatients, 25 relatives and care givers, 48 care team members **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Not reported	**Brief description of method and process of analysis:** Qualitative data submitted for content analysis. Fisher's exact test for quantitative data **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding successfully quitting A. Perceived barriers of successfully quitting "*I believe that the patch does not work, it doesn't solve anything.*" *(inpatient)* "*I think it [NRT] doesn't solve anything, a medicine that made you feel disgust would be better.*" *(relative)* Staff attitudes towards smoking cessation in patients E. Perceived impact of quitting on mental health Staff perceptions regarding interventions for smoking cessation in patients A. Perceived effectiveness and safety of interventions "*I know the nicotine patch and I know that it doesn't work.*"	**Limitations identified by author:** None reported **Limitations identified by team:** Small sample size, lack of information regarding methods **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Fundação de Amparo à Pesquisa do Estado de São Paulo

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Secker-Walker **Year:** 1994 **Quality score:** +	**What was/were the research questions:** Assess and compare the smoking cessation councelling activities of six health professional groups – one being community mental health counselors. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Cross Sectional Survey **By whom:** Not reported **What setting(s):** Community **When:** Between May 1990 and Novemeber 1991	**What populations where the sample recruited from:** Community mental health in four counties in the northeastern United States. **How were they recruited:** Community mental health counsellors were identified in each state through telephone directories and use of local informants. Letters sent to eligible participants with questionnaire, one follow up letter sent after 1 months to all. **How many participants were recruited:** N=80. 67% response rate **Were there specific exclusion critera:** All practitioners except those identified as specializing in emergency services, substance abuse rehabilitation, and services for the elderly.	**Brief description of method and process of analysis:** X^2 contingency tables, one way analysis of variance. Student newman kuels multiple comparison procedures/ spearmans correlation coefficient. **Key themes (with illustrative quotes if available) relevant to this review:** Staff skills and abilities B. Adequacy of training	**Limitations identified by author:** The low response rate for the Mental health counselors detracts from the generalizability of the results. **Limitations identified by team:** None identified. **Evidence gaps and/or recommendations for future research:** Highlights education and training needs. Training in the provision of brief patient or client centred smoking cessation councelling would probably help many of the providers, particularly those spending 5 or less minutes with a client. **Source of funding:** Supported by the National Institute of Health Grants.

		Were there specific inclusion criteria: Not reported.		

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Sharp **Year:** 2009 **Quality score:** +	**What was/were the research questions:** To assess psychiatric nurses' perspectives concerning tobacco dependence intervention. Beliefs, perceived skills, education, and clinical behaviors of psychiatric nurses regarding tobacco dependence. To report the findings from the survey and to describe practice, education, research, and policy implications. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Cross Sectional Survey **By whom:** Not reported **What setting(s):** Inpatient & Outpatient **When:** Early 2008.	**What populations where the sample recruited from:** A total of 4000 American Psychiatric Nurses Association members. **How were they recruited:** Questionnaire emailed to those with known, valid e-mail addresses- one time mailing with two follow up email reminders. Participants responded anonymously, completion implied consent. **How many participants were recruited:** 1381 (31.6%) of psychiatric nurses responded. **Were there specific exclusion critera:** Not reported. **Were there specific inclusion criteria:** A valid email address.	**Brief description of method and process of analysis:** Descriptive statisitcs were used to describe the main study variables. *t* Tests, chi-square ($\chi 2$), and Kendall's tau (τ)were used to compare those who referred patients with cessation resources with those who did not. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes towards smoking cessation in patients A. Negative beliefs regarding quitting B. Postive beliefs regarding quitting Perceived barriers and facilitators to quitting in patients A. Motivation, nicotine dependence, psycholosocial, and environmental factors Staff skills and abilities A. Confidence inproviding smoking cessation support B. Adequacy of training Staff perceptions of systems and policies	**Limitations identified by author:** Low response rate. It is likely that the nurses that are not represented in this sample are less interested in delivering and perhaps not as knowledgable about and/or motivated to deliver, tobacco dependence treatment. **Limitations identified by team:** A valid email address was needed to complete the questionnaire. **Evidence gaps and/or recommendations for future research:** The findings from this survey underscore the importance of strengthening nursing curriculum content and expanding continuing education opportunities so that nurses can build their knowledge and skills in tobacco dependence

			A. Priority of smoking cessation	interventions. **Source of funding:** Not reported.

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Sidani **Year:** 2011 **Quality score:** +	**What was/were the research questions:** To examine the smoking cessation beliefs of clinical mental health counselors and their practices with clients. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Cross Sectional Survey **By whom:** Not reported **What setting(s):** Inpatient and community **When:** Not specified.	**What populations where the sample recruited from:** A nationally representative sample of 700 clinical mental health counselors were selected from among the clinical members of the American Mental Health Counselors Association (N=2987). **How were they recruited:** The representartive sample of 700 clinical mental health counselor were mailed a questionnaire with a $1 bill monetary incentive. **How many participants were recruited:** 330 mental health counselors. **Were there specific exclusion critera:** Not reported. **Were there specific inclusion criteria:** Regisitered clinical mental health counselors.	**Brief description of method and process of analysis:** Descriptive statistics and non parametric statistics using SPSS for Windows. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes towards smoking cessation in patients A. Negative beliefs regarding quitting B. Postive beliefs regarding quitting E. Perceived impact of quitting on mental health Staff skills and abilities A. Confidence inproviding smoking cessation support B. Adequacy of training Staff perceptions in systems and policies B. Time and other resources Staff perceptions regarding interventions for smoking cessation in patients A. Perceived effectiveness and safety of interventions C. Lack of re-imbursement	**Limitations identified by author:** 1.Use of mail surveys may result in under- or over- reporting of certain behaviours, beliefs, or perceptions, which could undermine the internal validity. 2.Survey instrument had a closed format, may not yield as much information as an open format. 3.Monothematic nature of the survey instrument might sensitise some subjects to think about the topic in an uncharacteristic way. 4.Because cross sectional survey, no cause of effect relationship can be drawn. 5.The 53.1% response rate might be considered low enough to be a threat to external validity.6.The majority of the respondents were Caucasian (90.7%) and female (73.3%) which limits generalizability. **Limitations identified by team:** None identified.

				Evidence gaps and/or recommendations for future research: 1.Suggests that an investigation should look at the types of smoking cessation interventions counselors do use using qualitative methods. 2.An investigation into efficacy expectations for asking clients about smoking status and advising them to quit smoking – might give more information on how they shape smoking cessation counseling behaviour. 3.Research on what lessons had been learnt from patients who smoke, especially what worked for patients who quit might be useful for addressing smoking cessation with clients with mental health diagnoses. **Source of funding:** Not reported

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Snyder **Year:** 208 **Quality score:** ++	**What was/were the research questions:** To identify personal, social and environmental factors that affect smoking cessation in persons with serious mental illness **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Focus groups **By whom:** Not reported **What setting(s):** Inpatient **When:** Not reported	**What populations where the sample recruited from:** Patients from two psychiatric rehabilitation centes located in Midwestern City in the USA **How were they recruited:** Researcher announced study at client council meetings and other regular informational group sessions held at each program site **How many participants were recruited:** 25 (76%) **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** 24-55 years of age, willingness to discuss views, nicotine dependent, score of at least 25 on the Mini Mental Health State Examination	**Brief description of method and process of analysis:** Transcripts analysed using iterative process between researchers to identify key ideas, themes and relevant quotations. **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding smoking A. Reasons for/triggers of smoking: Psychological, environmental, and neurological factors "*I did quit for a few days, and that makes me a person [who] chooses; nobody is forcing me.*" "*When I'm sitting around doing nothing, I smoke more; it fills the time.*" "*[Not smoking would mean having] nothing to look forward to.*" "*I wouldn't know how not to smoke. I can't remember what it was like without smoking.*" "*Smoking is a crutch for people being lonely. Begging for cigarettes gets you connected. You get introduced, and it draws attention to you. It helps you get to know people. It's some kind of security.*" B. Priority of smoking "*Once I was in hospital and I didn't smoke for 8*	**Limitations identified by author:** None reported **Limitations identified by team:** Small sample size, lack of generalisability across settings **Evidence gaps and/or recommendations for future research:** Further research needed on the impact of smoke-free environments and severe mental illness smokers' behaviour **Source of funding:** International Society of Psychiatric-Mental Health Nurses

		days. I felt good. A couple [of] hours after leaving, my case worker offered me some money, and then I snapped in my head, 'I'm gonna buy some cigarettes'. I didn't have anything else to fall back on. There wasn't anything else affordable." Patients views, attitudes, and perceptions regarding making a quit attempt A. Perceived barriers to making a quit attempt "*I need something to knock it out of my mind completely."* "*I was never able to quit longer than a few weeks. All three times I quit I really didn't have the desire to quit."* "*I have a friend who doesn't smoke or drink, yet he coughs and coughs. He's a young guy, so I know it isn't just the smoking."* B. Perceived facilitators to making a quit attempt "*I think the government is trying to change the majority to the minority, and when you have the majority of people doing a certain thing, you're gonna choose to go with the majority.... If the majority of you guys didn't smoke cigarettes, I probably would not smoke. I would go with the majority."* "*I would need to drag my momma, my grandmother, everybody, even my dog, to encourage me not to smoke."*	

			"It is interesting to me that I am able to not smoke for several weeks when I stay at my mom's house, but the minute I am back in my apartment, I light up."	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Solty **Year:** 2009 **Quality score:** +	**What was/were the research questions:** To determine the prevalence of cigarette smoking and the degree of nicotine dependence, and to assess smokers attitudes towards smoking, motivation to quitting, and the frequentcy that advice to quit was provided. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Questionnaire survey **By whom:** Not reported **What setting(s):** Inpatient **When:** November 2004 – May 2005	**What populations where the sample recruited from:** Inpatients in the Foothills medical centre in Calgary, Alberta. Cananda. **How were they recruited:** Patients were referred to participate in the study by their inpatient psychiatrist. **How many participants were recruited:** 211 (62% response rate). **Were there specific exclusion critera:** Not reported. **Were there specific inclusion criteria:** Aged 18 and over. Adequently	**Brief description of method and process of analysis:** Analysis was performed on SPSS version 9 software (SPSS Inc, Chicago, IL, 2006). Descriptive statistical and chi-square analysis of categorical. Chi-square analysis compared stages of change, and perceived pros and cons of smoking. Comparisons of continuous variables were conducted using ANOVA procedures with primary diagnostic groups **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding smoking A. Reasons for/triggers of smoking: Psychological, environmental, and neurological factors Patients views, attitudes and perceptions regarding making a quit attempt B. Perceived facilitators to making a quit attempt Patients views, attitudes, and perceptions regarding successfully quitting A. Perceived barriers of successfully quitting	**Limitations identified by author:** Limited by its focus on primary psychiatric diagnosis without attention to comorbidity. Use of biological markers to vaerify self reported smoking behaviours would have improved its valiaidity. **Limitations identified by team:** Lower than optimal response rate, potential for selection bias **Evidence gaps and/or recommendations for future research:** Future studies should examine factors limiting the amount of smoking cessation advice given to motivated psychiatric inpatients and determine the interventions that are

		psychiatrically stabilized and within 1 to 2 weeks of anticipated discharge from hospital.	B. Perceived facilitators to successfully quitting	most effective for them. **Source of funding:** Calgary Health Region Tobacco Cessation Committee.

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Stubbs **Year:** 2004 **Quality score:** +	**What was/were the research questions:** Was to examine staff views on smoking at work in a large psychiatric hospital. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Cross sectional survey **By whom:** Not reported **What setting(s):** Inpatients **When:** January 2003.	**What populations where the sample recruited from:** All clinical staff of St Andrew's Hospital, Northampton, England. **How were they recruited:** Sent a postal questionnaire **How many participants were recruited:** 599 (40.7% response rate). **Were there specific exclusion critera:** None identified. **Were there specific inclusion criteria:** All clinical staff.	**Brief description of method and process of analysis:** The chi-squared (with Yates' correction) and Fisher's exact tests were used to test for differences in responses between smokers and non-smokers, and between psychiatrists and nurses. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes and beliefs regarding smoking in patients D. Cigarettes as a mechanism of control Staff attitudes towards smoking cessation in patients A. Negative beliefs regarding quitting B. Postive beliefs regarding quitting E. Perceived impact of quitting on mental health	**Limitations identified by author:** The distinction between smokers ans non-smokers – those who had recently quit might call thmesleves non-smokers and there responses might be expected to differ from those who are lifelong non-smokers. Small sample size, smokers and nurses appeared to be under represented. Findings relate to those working in a specialist independent hospital with many long stay patients and therefore cannot be generalized to National Health Service acute units. **Limitations identified by team:** None identified. **Evidence gaps and/or recommendations for future research:** None identified. **Source of funding:** Not reported.

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Tidey **Year:** 2009 **Quality score:** -	**What was/were the research questions:** To compare positive and negative smoking expectancies, and examined relationships between expectancies and intention to quit smoking, in smokers with schizophrenia, smokers with schizoaffective disorder, and smokers without psychiatric illness. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Questionnaire survey. **By whom:** Clinicians. **What setting(s):** Not reported. **When:** Not reported.	**What populations where the sample recruited from:** Those who had enrolled in one of four laboratory studies of smoking behaviour. **How were they recruited:** Not reported. **How many participants were recruited:** Schizophrenia n=46. Schizoaffective n= 35 (response rate not reported) **Were there specific exclusion critera:** Not reported. **Were there specific inclusion criteria:** Participants were heavy smokers with schizophrenia, schizoaffective disorder or no psychiatric disorder, At least 18 years of age,	**Brief description of method and process of analysis:** Group comparisons on demographic, clinical and smoking history measures were conducted using one-way analyses of variance tests (ANOVAs) and chi-square tests for categorical variables. Internal consistency reliabilities of the 7 SEQ scales were determined by calculating Cronbach's alpha coefficients for each group (SCZ, SCZAFF, CON). Values greater than 0.70 were considered acceptable (Kaplan and Saccuzzo, 2005). To examine how positive and negative smoking expectancies were related to intention to quit smoking within each group, between-groups 3×3 analysis of covariance tests (ANCOVAs) were first used to examine the effects of Group and Stage of Change (Precontemplation, Contemplation, Preparation) on importance scores from the 7 SEQ scales. **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding making a quit attempt C. Perceived facilitators to making a quit attempt	**Limitations identified by author:** Low participantion rate. **Limitations identified by team:** Response rate not reported, low relevance to review questions. **Evidence gaps and/or recommendations for future research:** A logical next step for this research would be to examine whether expectancies predict smoking cessation outcomes and withdrawal symptom severity in people with schizophrenia and schizoaffective disorder, as shown in nonpsychiatric smokers. **Source of funding:** Supported by NIDA grants and J.W.T. and a Senior Research Career Scientist Award from the Department of Veterans

		smoked at least 20 cigarettes per day and had scores of at least 6 on the Fagerstrom Test for Nicotine Dependence.		Affairs to D.J.R.

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Tong **Year:** 2010 **Quality score:** +	**What was/were the research questions:** Objective was to describe the smoking prevalence, smoking cessation practices, and beliefs for multiple types of health professionals across the United States. Also examined common factors associated with the self-reported delivery of tobacco dependence treatments, while controlling for health professional and practice demographics. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Questionnaire survey. **By whom:** Not reported **What setting(s):** Inpatient and community **When:** July 2003-	**What populations where the sample recruited from:** Seven health care professional groups; primary care physicians, emergency medicine physicians, psychiatrists, registered nurses, dentists, dental hygienists, and pharmacists. In the USA. **How were they recruited:** Letters, signed by The Robert Wood Johnson Foundation and endorsed by seven national health professional societies, were mailed describing the survey prior to the interviewers' first call. - American Psychiatric Association. Nationwide sampling frames were obtained from professional sampling companies that maintain databases. Primarily by computer-assisted telephone interview (68%) and	**Brief description of method and process of analysis:** The seven health professional groups were compared in terms of demographics, smoking-related behavior, conduct of the PHS smoking cessation guideline 5 A's, and beliefs regarding smoking cessation services using an adjusted *F* test suitable for complex survey data. Multivariate logistic regression was used to examine factors associated with health professionals self-reportedly performing each of the 5 A's. Independent variables in the regression analyses included health professional smoking status, health professional subgroup, and beliefs about smoking cessation. Statistical analyses were performed with STATA 9.0 (College Station, TX) using the "svy" command. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes towards smoking cessation in patients B. Postive beliefs regarding quitting Staff skills and abilities B. Adequacy of training Staff perceptions regarding interventions for smoking cessation in patients A. Perceived effectiveness and safety of interventions C. Lack of re-imbursement	**Limitations identified by author:** Heavily relies on self report responses. Smoking status is not biochemically validated. Lower reponse rate for certain health professional groups. Only offered monetart incentives for physicians, dentists, and registered nurses who initially refused the interview may have introduced a selection bias. **Limitations identified by team:** None identified. **Evidence gaps and/or recommendations for future research:** None identified. **Source of funding:** The Robert Wood Johnson Foundation

	February 2004.	supplemented by mailed questionnaires (32%) for those who could not be contacted or participate by telephone. **How many participants were recruited:** 2,804 participants – 400 psychiatry. **Were there specific exclusion critera:** Not reported. **Were there specific inclusion criteria:** The survey was limited to health professionals providing patient care 20 or more hours per week in a non-federal practice setting.		

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Tsourtos **Year:** 2011 **Quality score:** ++	**What was/were the research questions:** Focuses on why it is that non-smokers (never-smoked and ex-smokers) are 'resilient' to smoking in a population (people diagnosed with depression) where there is a high prevalence of smoking and high perceived stress levels, in comparison with current smokers? **What theoretical approach does the study take (if specified):** Components of Grounded Theory were adopted **How were the data collected:** **What method(s):** Interviews. **By whom:** Researchers. **What setting(s):** Community **When:** 2008 -2009	**What populations where the sample recruited from:** From the metropolitan Adelaide who were medically diagnosed with depression. **How were they recruited:** Participants were identified and recruited predominantly from general practice and a range of mental health services. The process of recruitment involved liaison with mental health case workers and general practice staff. **How many participants were recruited:** Thirty-four adults with a medical diagnosis of depression. **Were there specific exclusion critera:** Not reported.	**Brief description of method and process of analysis:** Data were collected until data saturation was achieved. All interviews were audio recorded and transcribed. Analysis commenced after the first two interviews were completed as part of discovering emerging themes and further developing the interview schedule for the remaining interviews (Ezzy 2002). All data were analysed for emerging themes and patterns through the use of NVivo version 8 (a qualitative software package). **Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding smoking A. Reasons for/triggers of smoking: Psychological, environmental, and neurological factors *"I started smoking 90 a day because of boredom."* "*Smoking has been a fall back for me because it has helped me in different situations; I just needed something that was going to get me through a hard time."* B. Priority of smoking "*It's like a security blanket."*	**Limitations identified by author:** Limited regarding the extent to which there is interplay between the individuals internal psychological properties and the external social environment. **Limitations identified by team:** None identified. **Evidence gaps and/or recommendations for future research:** Better understanding of what facilitators should be employed and barriers that need to be overcome when implementing public health programmes with regards to tobacco use. **Source of funding:** Minister for Health, Department of Heatlh (Government of Soth Australia).

		Were there specific inclusion criteria: Not reported.	Patients views, attitudes and perceptions regarding making a quit attempt A. Perceived barriers to making a quit attempt "*Smoking stresses my body but giving up increases stress to the max."* B. Perceived facilitators to making a quit attempt	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Weinberger **Year:** 2008 **Quality score:** -	**What was/were the research questions:** The current study examined the attitudes of clinicians regarding smoking cessation for psychiatric and substance abusing patients. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Cross sectional survey **By whom:** Not reported **What setting(s):** Inpatient **When:** September – October 1999.	**What populations where the sample recruited from:** Mental health clinicians at the Connecticut Mental Health Center (CMHC) in New Haven. **How were they recruited:** Not reported. **How many participants were recruited:** 34 completed the survey for a response rate of 53%. **Were there specific exclusion critera:** **Were there specific inclusion criteria:** Mental health clinicians at the Connecticut Mental Health Center (CMHC) in New Haven were eligible to participate Included treatment teams for patients with affective	**Brief description of method and process of analysis:** Chi-square tests were used to compare groups on demographic measures by smoking status.TheKruskal-Wallistestwasrun for each of the ten Clinician Attitude Survey items with smoking group as an independent variable. Mann-Whitney U Tests were run to compare responses on the Clinician Attitude Survey by gender. Nonparametric tests were run to account for the unequal sample sizes within independent variables of interest. For all analyses, statistical significance was defined with $p < .05$. Analyses were performed using Statistical Packages for Social Sciences (SPSS) software v.12.0 for Windows. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes towards smoking cessation in patients B. Postive beliefs regarding quitting E. Perceived impact of quitting on mental health Perceived barriers and facilitators to quitting in patients A. Motivation, nicotine dependence, psycholosocial, and environmental factors Staff perceptions regarding interventions for	**Limitations identified by author:** Small sample size and low response rate. **Limitations identified by team:** Potential for selection bias, medium relevance to review questions **Evidence gaps and/or recommendations for future research:** To repeat this study with a larger independent sample of mental health clinicians. **Source of funding:** Supported in part by National Institute of Drug Abuse grants.

		disorders, psychosis, anxiety and personality disorders, co-occurring disorders, residential programs and brief treatment.	smoking cessation in patients B. Awareness of staff of services	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Williams **Year:** 2009 **Quality score:** +	**What was/were the research questions:** A program evaluation study was designed to determine the effectiveness of our training on knowledge acquisition (via a pretest/posttest) and feedback about the quality and usefulness of the training (via a training evaluation). The study also included a baseline survey of participants' demographic information in addition to attitudes and current practices in treating tobacco dependence in smokers with mental illness. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Questionnaire survey	**What populations where the sample recruited from:** The 71 participants who regisitered at attend a 2 day training course focused on training mental health treatment providers to address tobacco dependence. **How were they recruited:** Training was advertised via brochures, mailings, and internet listings. **How many participants were recruited:** 71 who attended the course (response rate not reported) **Were there specific exclusion critera:** None reported. **Were there specific inclusion criteria:** None reported.	**Brief description of method and process of analysis:** All analyses were undertaken with SAS version 8.2. Possible associations of policies and procedures both with assessment of smoking status and with provision of smoking care were investigated by using chi square analyses (checking for multicolinearity) and stepwise logistic regression, in which variables with a p value of <.25 in the chi square analyses were included. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes and beliefs regarding smoking in patients A. Smoking as a personal choice Staff attitudes towards smoking cessation in patients D. Roles and responsibilities of staff in quitting Staff skills and abilities B. Adequacy of training Staff perceptions of systems and policies A. Priority of smoking cessation B. Time and other resources	**Limitations identified by author:** Not able to assess actual changes in treatment practices of these professionals who completed this training. **Limitations identified by team:** Response rate not reported, medium relevance to review questions **Evidence gaps and/or recommendations for future research:** Future initiatives might include actual chart review of cases seen by practitioners receiving such training in order to better deomonstatre the effect of this educational experience on specific clinical behaviours. **Source of funding:** Not reported.

	By whom: Not reported **What setting(s):** Inpatient & outpatients **When:** November 2006-March 2007.			

Study details	Review search parameters	Review population and setting	Results	Notes
Authors: Williams **Year:** 2011 **Review design:** Critical review **Quality score:** -	**Databases and website searched:** Not reported **Other search methods undertaken (e.g. reference checking):** Not reported **Years searched:** Not reported **Study type inclusion criteria:** Not reported **Study type exclusion criteria:** Not reported **Number of studies included:** Not clear **Method of synthesis:** Narrative synthesis	**Included populations:** Mental health populations **Excluded populations:** Not reported **Setting of included studies:** Inpatient and community based **External validity score:** -	**Key themes (with illustrative quotes if available) relevant to this review:** Patients views, attitudes and perceptions regarding successfully quitting A. Perceived barriers to successfully quitting *"Many do not believe that NRT improves a smoker's chance of quitting despite an abundance of evidence to the contrary… These same barriers are even greater in the mental health system."* "*Smokers are often mis-informed, mistakenly believing that nicotine is a carcinogen and that NRT poses more cardiovascular threat than smoking."* Staff skills and abilities B. Adequacy of training "*In order for cessation programmes to develop and be successful, staff need to be education about evidence-based tobacco dependence treatment practices. Education can also help to improve attitudes about the hope for successful treatment and encourage providers to offer alternatives to smoking"* Staff perceptions regarding interventions for smoking cessation in patients B. Awareness of staff of services "*Referral to a community of state-funded tobacco treatment may also not be likely given that psychiatrists lack awareness about these*	**Limitations identified by author:** None reported **Limitations identified by team:** Very limited information regarding the methods of the critical review **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** American Legacy Foundation, the New Jersey Department of Human Services, Division of Mental Health Services, the Cancer Institute of New Jersey, and unrestricted educational grant from Pfizer, Inc.

			programmes more often than other medical colleagues" D. Information and accessibility of support for patients "*Practical matters like not having a telephone or internet access could also be barriers to using telephone or internet-based services effectively"*	

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Wye **Year:** 2009 **Quality score:** ++	**What was/were the research questions:** To identify smoking policies and procedures in public psychiatric inpatient settings **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Survey **By whom:** Not reported **What setting(s):** Inpatient **When:** 2006	**What populations where the sample recruited from:** Unit managers, New Scout Wales, Australia **How were they recruited:** Identified from all publicly funded psychiatric inpatient units **How many participants were recruited:** 123 (94% response rate) **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Not reported	**Brief description of method and process of analysis:** Mailed questionnaires to nurse unit manager of each unit. Chi-squaredtests and stepwise logistic regression, checking for multicolinearity **Key themes (with illustrative quotes if available) relevant to this review:** Staff skills and abilities B. Adequacy of training	**Limitations identified by author:** Inaccurate reporting if unit manager was not actively involved in daily smokimng care activities, self-reported questionnaire (respondent bias) **Limitations identified by team:** No further limitations identified **Evidence gaps and/or recommendations for future research:** Recommended all psychiatric facilitatoes move towards being smoke-free institutions. Staff training is part of the solution for ensuring consistent enforcement of smoking restrictions and provision of smoking care **Source of funding:** Commonwealth Department of Health and Ageing

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Wye **Year:** 2010 **Quality score:** ++ **Please note:** Same study as Wye 2010	**What was/were the research questions:** To identify smoking policies and procedures in public psychiatric inpatient settings **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Survey **By whom:** Not reported **What setting(s):** Inpatient **When:** 2006	**What populations where the sample recruited from:** Unit managers, New Scout Wales, Australia **How were they recruited:** Identified from all publicily funded psychiatric inpatient units **How many participants were recruited:** 123 (94% response rate) **Were there specific exclusion critera:** Not reported **Were there specific inclusion criteria:** Not reported	**Brief description of method and process of analysis:** Mailed questionnaires to nurse unit manager of each unit. Chi-squaredtests and stepwise logistic regression, checking for multicolinearity **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes and beliefd regarding smoking in patients A. Smoking as a personal choice C. Smoking as a shared activity to build rapport Staff attitudes towards smoking cessation in patients A. Negative beliefs regarding quitting B. Postive beliefs regarding quitting Staff perceptions of systems and policies A. Priority of smoking cessation E. Other factors influencing the provisio of smoking cessation interventions	**Limitations identified by author:** Inaccurate reporting if unit manager was not actively involved in daily smokimng care activities, self-reported questionnaire (respondent bias) **Limitations identified by team:** No further limitations identified **Evidence gaps and/or recommendations for future research:** Recommended all psychiatric facilitatoes move towards being smoke-free institutions. Staff training is part of the solution for ensuring consistent enforcement of smoking restrictions and provision of smoking care **Source of funding:** Commonwealth Department of Health and Ageing

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Ziedonis **Year:** 1997 **Quality score:** -	**What was/were the research questions:** An evaluation of a smoking cessation programme for 24 smokers with Schizophrenia. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** Not reported **What method(s):** Narrative evaluation of a pilot smoking cessation program. **By whom:** Not reported **What setting(s):** Community **When:** Not specified.	**What populations where the sample recruited from:** From the Connecticut Mental Health Centre (CMHC) smoking cessation program evaluation. **How were they recruited:** Not reported. **How many participants were recruited:** 24 individuals **Were there specific exclusion critera:** Not reported. **Were there specific inclusion criteria:** Enrolled on the Connecticut Mental Health Centre (CMHC) smoking cessation program evaluation.	**Brief description of method and process of analysis:** Not reported. **Key themes (with illustrative quotes if available) relevant to this review:** Staff attitudes towards smoking cessation in patients E. Perceived impact of quitting on mental health	**Limitations identified by author:** Not reported. **Limitations identified by team:** Very limited information relating to methods and analysis. Small sample size, response rate not reported. **Evidence gaps and/or recommendations for future research:** The role of motivation as a prognostic and outcome factor requires further study. **Source of funding:** Supported in part by the L.P Markey Physician Scientist Training Program at Yale University School of Medicine.

Study details	Research parameters	Population and sample selection	Outcomes and methods of analysis Results	Notes
Authors: Zvolensky **Year:** 2005 **Quality score:** -	**What was/were the research questions:** Gauge the degree of basic cessation councelling provided by practitioners specialising in anxiety disorder treatment. Bench mark the level of smoking cessation knowledge amoung anxiety specialists. Assess whether practioners who had received formal training in smoking cessation in the past 3 years, compared to those who didn't, spent more time counceling patients to quit smoking. **What theoretical approach does the study take (if specified):** Not reported **How were the data collected:** **What method(s):** Cross Sectional Survey **By whom:** Not reported **What setting(s):** Inpatient	**What populations where the sample recruited from:** Mental health professionals – especially those dealing with anxiety disorders. **How were they recruited:** Two methods used – surveys manually disseminated in a one on one basis by trained research assistants at three professional conferences that included or focused exclusively on anxiety disorder research, the second included having a wed based portal located on the primary author's lab website to advertise the study and collect responses survey online. **How many participants were recruited:** 75 mental health professional took part (55% response rate). **Were there specific**	**Brief description of method and process of analysis:** Not reported **Key themes (with illustrative quotes if available) relevant to this review:** Staff skills and abilities B. Adequacy of training	**Limitations identified by author:** Self selection bias due to the voluntary selection criteria. Due to time restraints no descriptive information on participants (e.g. age) was collected. Reporting error though self report methods. **Limitations identified by team:** Low response rate, lack of details relating to analysis **Evidence gaps and/or recommendations for future research:** Findings should serve to prompt mental health training programs to recognise the lack of attention to smoking cessation practices among anxiety treatment specialists. **Source of funding:** Not reported.

	and community out patients. **When:** Not reported.	**exclusion critera:** Not reported **Were there specific inclusion criteria:** Not reported.		

APPENDIX 6. COLLABORATORS

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Component 3 "Smokefree Secondary Care Settings"

Review 6
A review of the effectiveness of smokefree strategies and interventions in secondary care settings

To inform the NICE guidance on:
'Smoking cessation in secondary care: acute and maternity services'
'Smoking cessation in secondary care: mental health services'

Draft 4 - 16th July 2013

Review Team
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November 2021: NICE guidelines PH45 (June 2013) and PH48 (November 2013) have been updated and replaced by NG209.
The recommendations labelled [2013] or [2013, amended 2021] in the updated guideline were based on these evidence reviews.
See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

Acknowledgements

The authors wish like to thank Antonia Simon and Jenny Woodman (EPPI-Centre), and Elena Ratschen and Leah Jayes (University of Nottingham) for their assistance with this review. For administrative support, our thanks to Diane Dixon and Aileen Paton (University of Stirling) and the NHS Centre for Smoking Cessation and Training. Finally, our thanks to Peter Shearn, Tricia Younger and Linda Sheppard of the NICE Project Team for their guidance.

Abbreviations

AMA	against medical advice
CI	confidence interval
CO	carbon monoxide
CPHE	Centre for Public Health Excellence (in NICE)
EPPI-Centre	Evidence for Policy and Practice Information and Co-ordinating Centre
ER4	Eppi-Reviewer version 4.0 software
ETS	environmental tobacco smoke
FT	full text
GP	general practitioner
HR	human resources
IARC	International Agency for Research on Cancer
IQR	interquartile ranges
ISM	Institute for Social Marketing
NA	not applicable
NCC-NSC	National Collaborating Centre for Nursing and Supportive Care
NCSCT	National Centre for Smoking Cessation and Training
NICE	National Institute for Health and Clinical Excellence
NHS	National Health Service (UK)
NGRI	not guilty by reason of insanity
NR	not reported
NRT	nicotine replacement therapy
OR	odds ratio
PRN	*pro re nata* – as required (used as a direction in prescriptions)
Rev 6	Review 6
Rev 7	Review 7
SAR	special administrative region (of China)
SD	standard deviation
SHS	second-hand smoke
UBA	uncontrolled before and after (study design)
UK	United Kingdom
UKCTCS	UK Centre for Tobacco Control Studies
USA	United States of America
VA hospital	United States Department of Veterans Affairs hospital
WHO	World Health Organization

Executive Summary

The National Institute for Health and Clinical Excellence (NICE) commissioned this review to inform two separate pieces of complementary guidance on smoking cessation in secondary care, one relating to acute and maternity services and the other to mental health services. The guidance will address smokefree policies and smoking cessation and make recommendations on approaches to help secondary care commissioners, professionals and managers working in these two areas of healthcare.

The Health Act 2006 was passed on 16th July 2006 and required that all indoor and substantially enclosed outdoor workplaces and public places in England and Wales became smoke-free by 1st July 2007, specifically banning smoking tobacco. In March 2007, residential mental health settings were given a temporary one year exemption from the implementation date, thus were required to become smoke-free by 1st July 2008. There is no legislative requirement for smokefree grounds in England and Wales, although some individual institutions and Trusts have introduced and trialled policies requiring smokefree grounds.

The aim of this review was to systematically review the effectiveness of smokefree strategies and interventions in secondary care settings (acute, maternity and mental health settings). The initial search and screening stages were combined with a parallel review of the barriers to and facilitators for implementing smokefree strategies and interventions in secondary care settings conducted by members of the same research team.

The review aimed to address the following questions:

Question 1: How effective are strategies and interventions for ensuring compliance with smokefree legislation and local smokefree policies in secondary care settings?

- **Subsidiary question:** How does the effectiveness vary for different population groups, health status or speciality care services?

Question 2: Are there any unintended consequences from adopting smokefree approaches in acute and maternity care settings?

Question 3: Are there any unintended consequences from adopting smokefree approaches in mental healthcare settings?

As the extent of evidence on the effectiveness of smokefree strategies was limited to two studies for Question 1, the data are also presented from identified effectiveness studies with a comparative design to measure indicators of compliance in settings which had a smokefree policy with at least one supporting strategy covering the whole estate or an indoors-only policy.

Sensitive search strategies were developed by an information specialist in conjunction with the research team and peer-reviewed by information specialists at NICE. Searches were run in February 2012 across 22 databases and 26 selected websites. All of the literature searches were conducted for papers published in English from 1990 onwards.

All study data were uploaded and managed using the EPPI-Centre's online review software. Initial inclusion criteria were refined using four rounds of pilot screening to identify 229 papers for full-text screening from 17,000 title and abstract records. Papers were then re-screened in full-text for relevance and applicability and 27 studies (28 papers) identified for data extraction. Data were extracted and assessed for quality using recommended NICE templates and critical appraisal checklists. At all stages of the screening and rating process two or more members of the research team conducted independent assessments and a third member adjudicated on any unresolved disagreements.

Twenty-six of the included studies were published in academic or practitioner journals and one was an unpublished report. Only one of the studies identified was an experimental design (Kempf 1996 [USA +]). One study was a randomised controlled trial; the remainder were quantitative observational studies, two of which had a concurrent control group. Only two studies evaluated the effectiveness of a supporting strategy in ensuring compliance with smokefree legislation: one the effectiveness of the introduction of 'No Smoking Outdoors' signs (Nagle 1996 [Australia +]), the other nursing staff intervening to address a patient's urge to smoke (Erwin 1991 [USA -]). The majority of studies were conducted in the USA, with only two conducted in a UK setting (Cormac 2010 [UK +], Shetty 2010 [UK +]) and a small number in Europe and the rest of the world. Around half of the studies were published before 2000. The methodological quality of studies varied from low to moderate, with most rated as 'moderate'.

Sixteen of the studies were conducted in a mental healthcare setting. These studies were from four countries (France, Switzerland, UK and USA) and were published from 1991 to 2010; with the early studies all from the USA and those from 2008 onwards from European countries also. Eleven studies were conduced in an acute and/or maternity healthcare setting. These studies were from five different countries (Australia, Canada, Israel, Spain and USA) and were published from 1990 to 2010.

Thirteen of the studies were in secondary care settings that were implementing smokefree grounds; a step beyond the current smokefree legislative requirements of the UK. Seven of these were conducted in a mental healthcare setting (Cormac 2010 [England +], Haller 1996 [USA +], Hempel 2010 [USA +], Joseph 1993 [USA +], Kempf 1996 [USA +], Patten 1995 [USA +], Quinn 2000 [USA -], Shetty 2010 [England +]) and six in an acute and/or maternity healthcare setting (Gadomski 2010 [USA +], Hudzinski 1990 [USA +], Kvern 2006 [Canada -], Nagle 1996 [Australia +], Ripley-Moffitt 2010 [USA +], Wheeler 2007 [USA -]).

Briefly, some of the main findings of the review were:

- An examination of proxy indicators of compliance appear to show that smokefree legislation can be effective.
- There is no strong evidence from well-conducted trials, and there were limitations in the available evidence concerning which strategies best support compliance with smokefree policy. As a result, there are limitations to the advice that the review can give in this area.
- The review was unable to provide conclusive evidence of the effectiveness of the impact of different supporting strategies. Despite the requirement for at least one supporting strategy to be reported for the study to be included, there was a lack of clarity regarding the effects of multiple strategies, or the effects of individual strategies where more than one was reported.
- Findings in mental health settings showed that the expected adverse consequences have not been realised.
- For acute and maternity settings the largest positive effects appear to be in relation to staff smoking behaviour, with fewer negative effects found.
- Although much of the available evidence on effectiveness is relatively recent, there is limited evidence from the UK, which limits the review's applicability. However, all the included studies were conducted in similar high income countries.

The review presents 34 evidence statements.

Evidence Statements

Effectiveness of Supporting Strategies and Interventions for Ensuring Compliance: Acute and Maternity Settings

Evidence statement 1.1: There is **weak** evidence from one before and after study in Australia (**Nagle 1996 [+]**) in an **acute and maternity setting** that 'no smoking outdoors' signage decreases compliance with state indoor (hospital buildings and vehicles) smokefree legislation in New South Wales and a local (hospital board's) outdoor partial smokefree policy. Comparing use of the outdoor sites selected to become smokefree 2 weeks before implementation of the smokefree outdoor signage, with usage 1 month after its implementation, there was a significant increase in the proportion of outdoor smokers who smoked in those areas at the intervention hospital ($p<0.001$, Chi-square=11.71, df=1). ***Other supporting strategies*** *were: an implementation committee (formed by occupational health and safety team with reps from NSW Cancer Council, National Heart Foundation, hospital management, unions, and study's lead author), the policy launch incorporated into the World No Tobacco Day activities, staff newsletters, bulletin boards and information by supervisors*.

UK Applicability: This evidence was conducted outside the UK, however the policy covers outdoor smokefree (a local policy similar to the UK context) and there is no reason to believe the strategy's effect is not applicable to the UK setting.

Effectiveness of Supporting Strategies and Interventions for Ensuring Compliance: Mental Healthcare Settings

Evidence statement 1.2: There is **weak** evidence from one interrupted time series in the USA (**Erwin 1991 [-]**) in a **mental healthcare setting** that staff aiding inpatients' compliance through strategies such as encouraging patients to participate in smoking cessation groups and addressing patients' urge to smoke increases patient compliance a local (US Department of Veterans Affairs') smokefree buildings policy. One week post-implementation, nursing staff ratings of their own overall individual effectiveness using policies listed above to help inpatients comply with smokefree on the wards by addressing their urge to smoke increased four weeks post-implementation (no p values calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke.*

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the strategy's effect is not applicable to the UK setting.

Staff Compliance with Smokefree: Smoking Behaviour (Acute & Maternity)

Evidence statement 1.3: There is **moderate** evidence from two cohort studies in the USA **(Stillman 1990 [+])** and Canada (**Kvern 2006 [-])**, one before and after study from Israel (**Donchin 2004 [I+]**) and one interrupted time series from Spain that (**Martinez 2008 [+])** the implementation of local-level policy and national legislation for smokefree implementation in an **acute and maternity setting** decreases the number of staff smoking.

UK Applicability: This evidence was conducted outside the UK and the policy or national legislation covered in most (indoor smokefree) is already national legislation in the UK however one recent study's policy covers smokefree grounds (a local policy similar to the UK context); there is no reason to believe the effect is not applicable to the UK setting.

(a) Observed Smoking Behaviour: There is evidence from two cohort studies in the USA (**Stillman 1990 [+])**, and Canada (**Kvern 2006 [-]**) that the implementation of local smokefree policies in an **acute and maternity setting** decreases the number of staff observed smoking. In the USA, **Stillman 1990 [+]** reported a significant decrease in observed staff smoking in hospital cafeterias and lounge areas at 1 and 6 months after the local (hospital board's) smokefree buildings policy was introduced ($p<0.0001$). ***Supporting strategies*** *included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees*. **Kvern 2006 [-]** in Canada reported that the number of contacts security personnel had with staff smokers on hospital grounds decreased over 1, 2 and 3 months post-implementation of a local (regional health authority's) smokefree grounds policy. ***Supporting strategies*** *included written policies, an implementation committee, signage, staff meetings, notices in staff payslips, cessation support, pharmacotherapies, temporary abstinence support for inpatients, moving of ashtrays and shelters to the site periphery, staff training, media campaigns, bilingual information sheets for patients and the public and information on health organisations' websites.*

(b) Self-reported Smoking Behaviour: There is evidence from one before and after study in Israel (**Donchin 2004 [+]**) and one interrupted time series in Spain (**Martinez 2008 [+]**) that local-level policy and national legislation for smokefree implementation with supporting strategies decreases staff self-reported smoking during working hours in an **acute and maternity setting**. **Donchin 2004 [+]** in Israel reported a significant increase in staff smokers reporting they always usually leave their workstation to smoke following the implementation of a local (hospital board's) smokefree buildings policy, measured 3 months before and 6-9 month after implementation ($p<0.0001$). ***Supporting strategies*** *included an implementation committee, cessation support, smoking shelters erected outside the hospital building, bans on the sale of tobacco products on site, an information campaign 2 months before the policy was introduced, a press conference launch and fines for violations*. **Martinez 2008 [+]** reported that in 2001 "few smokers" (no data given) reported to have smoked inside the nursing rooms and, following the implementation of national indoor smokefree legislation in Spain in 2005, no employee respondents reported smoking inside the nursing rooms in 2006. In 2004 and 2006, no employees reported smoking in the smokefree cafeteria and the employees' rest areas. ***Supporting strategies*** *included the closure of smoking rooms and tobacco control training for nurses*.

Visitor Compliance with Smokefree: Smoking Behaviour (Acute & Maternity)

Evidence statement 1.4: There is **weak** evidence from two cohort studies, one in the USA **(Stillman 1990 [+])** and one in Canada **(Kvern 2006 [-])**, in an **acute and maternity setting** that implementation of local smokefree policies with supporting strategies decreases hospital visitor smoking.

UK Applicability: This evidence was conducted outside the UK, however one of the two studies' policy covers smokefree grounds (a policy implemented in parts of the UK) and there is no reason to believe the effect is not applicable to the UK setting.

In the USA, **Stillman 1990 [+]** reported a significant decrease in observed visitor smoking in hospital cafeterias and lounge areas at 1 and 6 months after the local (hospital board's) smokefree buildings policy was introduced ($p<0.0001$). ***Supporting strategies*** *included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees*. **Kvern 2006 [-]** in Canada reported that the number of contacts security personnel had with visitor smokers on hospital grounds decreased over 1, 2 and 3 months

post-implementation of a local (regional health authority's) smokefree grounds policy. ***Supporting strategies*** *included: written policies, an implementation committee, signage, staff meetings, notices in staff payslips, cessation support, pharmacotherapies, temporary abstinence support for inpatients, moving of ashtrays and shelters to the site periphery, staff training, media campaigns, bilingual information sheets for patients and the public and information on health organisations' websites*.

Patient Compliance with Smokefree: Smoking Behaviour (Acute & Maternity)

Evidence statement 1.5: There is **weak** evidence from one before and after study in Canada (**Kvern 2006 [-]**) about the impact of local smokefree policies with supporting strategies on inpatient smoking behaviour in an **acute and maternity setting**.

UK Applicability: This evidence was conducted outside the UK, however the policy covers smokefree grounds (a policy implemented in parts of the UK) and there is no reason to believe the effect is not applicable to the UK setting.

There is **weak** evidence from one cohort study in Canada (**Kvern 2006 [-]**) that the number of inpatients challenged about smoking on hospital grounds by security personnel decreased over 1, 2 and 3 months post-implementation of a local (regional health authority's) smokefree grounds policy with supporting strategies. ***Supporting strategies*** *included written policies, an implementation committee, signage, staff meetings, notices in staff payslips, cessation support, pharmacotherapies, temporary abstinence support for inpatients, moving of ashtrays and shelters to the site periphery, staff training, media campaigns, bilingual information sheets for patients and the public and information on health organisations' websites*.

All Hospital Users' Compliance with Smokefree: Smoking Behaviour (Acute & Maternity)

Evidence statement 1.6: There is **weak** evidence from two before and after studies in Canada (**Kvern 2006 [-])** and Israel **(Donchin 2004 [+]**) in an **acute and maternity setting** that local smokefree policy implementation with supporting strategies decreases observed smoking amongst all hospital users as a whole (patients, staff and visitors).

UK Applicability: This evidence was conducted outside the UK, however one of the two studies' policy covers smokefree grounds (a policy implemented in parts of the UK) and there is no reason to believe the effect is not applicable to the UK setting.

In Israel, **Donchin 2004 [+]** reported a significant reduction in observed smoking ($p<0.001$), frequently observed smoking (p value not reported) and occasionally observed smoking (p value not reported) by employees of other employees, patients, or visitors in unauthorized areas in the hospital following the implementation of a local (hospital board's) smokefree buildings policy, measured 3 months before and 6-9 month after implementation. ***Supporting strategies*** *included an implementation committee, posters/signage, staff letters/payslip notes, incorporating the policy launch with World No Tobacco Day, notices on staff bulletin boards and notification by supervisors*. **Kvern 2006 [-]** in Canada reported that the number of people observed smoking on facility grounds had reduced between 1 month pre-implementation of a local (regional health authority's) smokefree grounds policy and 1 month post-implementation. ***Supporting strategies*** *included written policies, an implementation committee, signage, staff meetings, notices in staff payslips, cessation support, pharmacotherapies, temporary abstinence support for inpatients, moving of*

ashtrays and shelters to the site periphery, staff training, media campaigns, bilingual information sheets for patients and the public and information on health organisations' websites.

Air Quality in Acute & Maternity Settings

Evidence statement 1.7: There is evidence from two before and after studies, one in the USA **(Wheeler 2007 [-])** and one in Spain **(Fernandez 2008 [+]**), one interrupted time series in Spain **(Martinez 2008 [+])** and one cohort study in the USA **(Stillman 1990 [+])** about the impact of local-level policy and national legislation for smokefree on air quality in an **acute and maternity setting**.

UK Applicability: This evidence was conducted outside the UK and the policy or national legislation covered in most (indoor smokefree) is already national legislation in the UK, however one study's policy covers smokefree grounds and buildings (a policy implemented in parts of the UK); there is no reason to believe the effect is not applicable to the UK setting.

(a) There is **moderate** evidence from one before and after study in Spain (**Fernandez 2008 [+]**) and one cohort study in the USA (**Stillman 1990 [+]**) using objective measures that local-level policy and national legislation for smokefree implementation with supporting strategies decreases atmospheric nicotine vapour measurements. **Fernandez 2008 [+]** in Spain reported that median nicotine concentration levels declined significantly in all seven locations measured across the 44 hospitals over the 4 months pre-implementation to the same period 1 year post-implementation of national indoor smokefree legislation in Spain. The overall median nicotine concentration level significantly declined from pre- to post-implementation ($p<0.01$). There were no sub-group differences in median nicotine concentrations before and after indoor smokefree legislation implementation by the type or size of hospital and number of employees. ***Supporting strategies*** *included cessation support to professionals, patients and visitors, staff training in tobacco control and guaranteeing common follow up and evaluation*. In the USA, **Stillman 1990 [+]** reported a significant decrease in median levels of nicotine concentrations 8 months after the local (hospital board's) smokefree buildings policy was implemented, compared with 8 months before implementation: in visitor/patient waiting areas and in cafeterias (both $p<0.001$); in staff lounges and in offices (both $p<0.01$); in corridors and elevators and in patient areas (both $p<0.05$). ***Supporting strategies*** *included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees*.

(b) There is **weak** evidence from one before and after study (**Wheeler 2007 [-]**) in the USA and one interrupted time series (**Martinez 2008 [+]**) in Spain that local-level policy and national legislation for smokefree implementation with supporting strategies decreases perceived or actual exposure to environmental tobacco smoke (subjective measures). **Wheeler 2007 [-]** in the USA reported significantly fewer employees claiming that they had to walk through cigarette smoke on campus 10 months after the implementation of a local (university hospital board's) smokefree indoors and outdoors policy, than 3 months before the policy ($p<0.0001$). ***Supporting strategies*** *included written policies, an implementation committee, posters, staff meetings, letters in staff payslips, patient appointments letters, cessation support, pharmacotherapies and announcements in local media*. In Spain, **Martinez 2008 [+]** reported the proportion of employees who claimed to work in a smokefree environment increased significantly from 2 years pre- to 1 year post-implementation of national indoor smokefree legislation in Spain, 95% CI: 26.2-39.7 in 2001 to 95% CI: 87.3-94.6 in 2006. The proportion who reported they were exposed for <1 hour and for 1-4 hours decreased significantly from pre to post ban. ***Supporting strategies*** *included the closure of smoking rooms and staff training*.

Other Indicators of Smokefree Compliance (Acute & Maternity)

Evidence statement 1.8: There is **inconsistent** evidence from one cohort study in the USA (**Stillman 1990 [+]**) in an **acute and maternity setting** that implementation of the local smokefree buildings policy with supporting strategies decreases the presence of cigarette butts in ashtrays. In the USA, **Stillman 1990 [+]** found a significant reduction in counts in indoor locations: the elevator lobby areas ($p<0.01$) and waiting lounges ($p<0.01$) in the 6 months after smokefree implementation of the local (hospital board's) smokefree buildings policy compared with the 6 months before. There was a non-significant increase in the number of butts recorded in ashtrays at the hospital entrances at the parking garages and the change was only significant ($p<0.05$) for the morning count in this location. ***Supporting strategies*** *included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees*.

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the effect is not applicable to the UK setting.

Evidence statement 1.9: There is **weak** evidence from one cohort study in the USA **(Stillman 1990 [+])** in an **acute and maternity setting** that implementation of the local (hospital board's) smokefree buildings policy with supporting strategies decreases fire incidents due to negligent smoking between the total 4 years before implementation to the total 1 year after implementation. ***Supporting strategies*** *included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees.*

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the effect is not applicable to the UK setting.

Inpatient Compliance with Smokefree: Requests to Terminate Smoking (Mental Healthcare)

Evidence statement 1.10: There is **weak** evidence from one interrupted time series in the USA **(Erwin 1991 [-])** and one before and after study in the USA (**Patten 1995 [+]**) that implementation of local smokefree policies, one indoors only **(Erwin 1991 [-]**) and one indoors and outdoors (**Patten 1995 [+]**, both in the USA), with supporting strategies may increase inpatient smoking violations in a **mental healthcare setting.**

UK Applicability: This evidence was conducted outside the UK and the policy covered in one (indoor smokefree) is already national legislation in the UK however the other study's policy covers smokefree grounds and buildings (a policy implemented in parts of the UK); there is no reason to believe the effect is not applicable to the UK setting.

One interrupted time series in the USA (**Erwin 1991 [-]**) reported an increase in nursing staff requesting inpatients cease smoking a lit cigarette, between 1 week post-implementation and 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke*. One before and after study in the USA (**Patten 1995 [+]**) found that the frequency of smoking in the hospital room according to chart reports increased significantly between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy ($p<0.05$). ***Supporting strategies*** *included an implementation*

committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence.

Inpatient Compliance with Smokefree: Smoking-Related Contraband (Mental Healthcare)

Evidence statement 1.11: There is **weak** evidence from one before and after study in the USA (**Matthews 2005 [-]**), one interrupted time series in the USA **(Erwin 1991 [-])** and one cohort study in the USA **(Rauter 1997 [+])** in **mental health settings** that local policies for smokefree implementation indoors with supporting strategies increases occurrences of inpatient's smoking related contraband, although this is not maintained.

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the effect is not applicable to the UK setting.

Matthews 2005 [-] in the USA reported that 3 months after the implementation of a local (hospital's) smokefree buildings policy, there was a rise in nursing staff respondents reporting a *perceived* increase in male inpatients' smoking-related contraband post-implementation compared with respondents *anticipating* an increase in male inpatients' smoking-related contraband 3 months pre-implementation (p=0.05). No significant differences were found between the total number of recorded instances of contraband related to the 3 months before and 3 months after the smokefree policy was implemented. ***Supporting strategies*** *included patient education about nicotine addiction and withdrawal and pharmacotherapies*. **Erwin 1991 [-]** in the USA reported a decline in nursing staff reporting that they had discouraged family or significant others from "smuggling" cigarettes to inpatients, between 1 week post-implementation and 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values were calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke*. **Rauter 1997 [-]** in the USA reported instances of possession of unauthorised cigarettes and matches were raised in the 3 months before a local (hospital's) smokefree buildings policy was initiated in the psychiatric hospital's buildings, and in the first 3 months of smokefree. For the same period 1 year later, recorded incidents of contraband possession had dropped by two-thirds (no statistical analysis reported). *Patients wishing to participate in smoking reduction workshops were urged to do so, but no other supporting strategies for the policy were reported*.

Air Quality in Mental Healthcare Settings

Evidence statement 1.12: There is **moderate** evidence from two before and after studies, one in Switzerland **(Etter 2008 [+]** and one in France **(Vorspan 2009 [+])**, about the impact of local-level policy and national legislation for smokefree implementation on air quality in a **mental healthcare setting**. Both studies found that indoor smokefree implementation with supporting strategies decreases perceived or actual exposure to environmental tobacco smoke, whereas the Swiss study (**Etter 2008 [+])** also reported that non-smoking inpatient and staff reports of annoyance from environmental tobacco smoke also decreased after the implementation of the local indoor smokefree policy.

UK Applicability: This evidence was conducted outside the UK and the policy or national legislation covered (indoor smokefree) is already national legislation in the UK however there is no reason to believe the effect is not applicable to the UK setting.

(a) Impact on Hospital Staff: From 2 years pre- to 1 year post-implementation of a local (hospital administration's) smokefree buildings policy, **Etter 2008 [+]** in Switzerland found there was a significant increase in the percentage of non-smokers staff reporting that they were 'absolutely not' annoyed by ETS in their unit in dining rooms ($p<0.001$) and corridors ($p=0.023$). Between 2003 (no indoor smokefree policy) and 2006 (total indoors smokefree), there was a significant increase in the proportion of non-smoker staff reporting that they were 'never' exposed to ETS in their unit in bedrooms ($p=0.041$), dining rooms ($p=0.004$) and corridors ($p=0.006$). Non-smoker staff reported more exposure to ETS than patients across all surveys. ***Supporting strategies*** *included signage, cessation support, pharmacotherapies, closure of smoking rooms and staff training*. **Vorspan 2009 [+]** in France reported that in a sub-sample of staff classified as "exposed" [to ETS] non-smokers pre-ban, 1 month after the implementation of national indoor smokefree legislation in France there was a significant decrease in mean cotinine level ($p=0.045$). ***Supporting strategies*** *included pharmacotherapies for patients and staff, closure of smoking rooms and evaluation of patients for smoking breaks*.

(b) Impact on Inpatients: From 2 years pre- to 1 year post-implementation of a local (hospital administration's) smokefree buildings policy, **Etter 2008 [+]** in Switzerland found there was a significant increase in the percentage of non-smoker inpatients reporting that they were 'absolutely not' annoyed by ETS in their unit in dining rooms ($p=0.007$). Between 2003 (no indoor smokefree policy) and 2006 (total indoors smokefree), there was a non-significant increase in the percentage of non-smoker inpatients reporting that they were 'never' exposed to ETS in their unit in corridors ($p=0.029$). ***Supporting strategies*** *included signage, cessation support, pharmacotherapies, closure of smoking rooms and staff training*.

Other Impacts on Patients: Hospital Utilization and Inpatient Retention (Acute & Maternity)

Evidence statement 2.1: There is **weak** evidence from two uncontrolled before and after studies in the USA **(Gadomski 2010 [+], Wheeler 2007 [-]**) about the impact of local policy implementation for smokefree buildings and grounds with supporting strategies on hospital inpatient admissions in an **acute and maternity setting**.

UK Applicability: This evidence was conducted outside the UK, however the policies include smokefree grounds and buildings (a policy implemented in parts of the UK), the papers were published in the last 5 years, and there is no reason to believe the effect on patients is not applicable to the UK setting.

(a) There is **weak** evidence from two uncontrolled before and after studies in the USA (**Gadomski 2010 [+], Wheeler 2007 [-]**) in an **acute and maternity setting** that local smokefree buildings and grounds policy implementation with supporting strategies does not adversely change the number or characteristics of inpatients admitted to hospital. **Gadomski 2010 [+]** in the USA observed no adverse effects on inpatient volume in the 18 months before implementation of the local (hospital's) smokefree buildings and smokefree grounds policy, and in the 23 months post-implementation and there was little variation in the proportion of inpatients who smoked before and after implementation. ***Supporting strategies*** *included pharmacotherapies, cessation support, a campus map detailing smokefree borders, and staff, community and patient education*. **Wheeler 2007 [-]** in the USA reported that the 12-month mean licensed bed occupancy and the 12-month mean staffed bed occupancy increased slightly from pre-to post-implementation of a local (university hospital board's) policy for smokefree indoors and outdoors with supporting strategies. ***Supporting strategies*** *included written policies, an implementation committee, posters, staff meetings, letters in*

staff payslips, patient appointments letters, cessation support, pharmacotherapies and announcements in local media.

(b) There is **weak** evidence from one uncontrolled before and after study in the USA (**Gadomski 2010 [+]**) in an **acute and maternity setting** that implementation of a local (hospital's) smokefree buildings and smokefree grounds policy with supporting strategies does not change the number of inpatients signing out against medical advice (AMA) due to 'having to smoke' in the 6 months before and 6 months after implementation (no p values given). Smoking amongst all inpatients signing out AMA increased between 6 months pre-smokefree and 6 months post-smokefree but returned to the pre-smokefree baseline 1 year later (no statistical analysis presented). ***Supporting strategies*** *included pharmacotherapies, cessation support, a campus map detailing smokefree borders, and staff, community and patient education*.

Other Impacts on Patients: Inpatient NRT Prescriptions and NRT Use (Acute & Maternity)

Evidence statement 2.2: There is **weak** evidence from two uncontrolled before and after studies with different samples, one in the USA (**Gadomski 2010 [+])** and one in Canada (**Kvern 2006 [-]**), that **local smokefree policy implementation** with the supporting strategies of cessation support and pharmacotherapies/NRT provision increases the use of NRT by inpatients who smoke in an **acute or maternity care setting**.

UK Applicability: This evidence was conducted outside the UK, however the policies include smokefree grounds (a policy implemented in parts of the UK), and there is no reason to believe the effect on patients is not applicable to the UK setting.

Gadomski 2010 [+] in the USA reported that NRT prescriptions for inpatients increased in the 18 months before and 23 months after implementation of a local (hospital's) smokefree buildings and smokefree grounds policy, with a significant increase in prescriptions 1 month prior to implementation (p=0.008). ***Other supporting strategies*** *included cessation support, a campus map detailing smokefree borders, and staff, community and patient education*. **Kvern 2006 [-]** in Canada reported that NRT usage for inpatient support increased between before implementation of a local (regional health authority's) smokefree grounds policy and 3 months post-implementation. ***Other supporting strategies*** *included written policies, an implementation committee, signage, staff meetings, notices in staff payslips, cessation support, temporary abstinence support for inpatients, moving of ashtrays and shelters to the site periphery, staff training, media campaigns, bilingual information sheets for patients and the public and information on health organisations' websites*.

Other Impacts on Staff: Staff Smoking (Acute & Maternity)

Evidence statement 2.3: There is evidence from five before and after studies, four in the USA **(Hudzinski 1990 [+], Gadomski 2010 [+], Wheeler 2007 [-], Daughton 1992 [+])**, and one in Israel **(Donchin 2004 [+])**, one cohort study in the USA (**Stillman 1990 [+]**) and one interrupted time series in Spain (**Martinez 2008 [+]**) about the impact of local-level policy and national legislation for smokefree implementation on staff smoking in an **acute and maternity setting**.

UK Applicability: This evidence was conducted outside the UK, however nearly half the studies test smokefree grounds and buildings (a policy implemented in parts of the UK); the others test indoor smokefree already national legislation in the UK. There is no reason to believe the effect on staff is not applicable to the UK setting.

(a) Staff Smoking Rates: There is **moderate** evidence from three before and after studies in the USA (**Hudzinski 1990 [+], Gadomski 2010 [+], Wheeler 2007 [-]**), one cohort study in the USA (**Stillman 1990 [+]**) and one interrupted time series in Spain (**Martinez 2008 [+]**) to suggest that local-level policy and national legislation for smokefree implementation with supporting strategies **decreases** smoking rates amongst staff in an **acute and maternity setting**.

Hudzinski 1990 [+] in the USA reported that the proportion of hospital staff who self-reported that they smoked significantly decreased from 6 months pre- to 6 months post-implementation of a local (medical foundation's) smokefree (campus) buildings and grounds policy (Chi-square=11.53, p<0.003). ***Supporting strategies*** *included a Smoke-Free Task Force (with clinicians, psychologists, and administrative personnel from public affairs and employee relations departments)*. **Gadomski 2010 [+]** in the USA reported a decrease in employee smoking prevalence from 1 year pre- to 1 year post-implementation of a local (hospital's) smokefree buildings and smokefree grounds policy (p<0.001). ***Supporting strategies*** *included pharmacotherapies, cessation support, a campus map detailing smokefree borders, and staff, community and patient education*. **Wheeler 2007 [-]** in the USA reported significantly fewer employees reporting that they were a current smoker 10 months after the implementation of a local (university hospital board's) policy for smokefree indoors and outdoors than 3 months before implementation (p<0.0001). ***Supporting strategies*** *included written policies, an implementation committee, posters, staff meetings, letters in staff payslips, patient appointments letters, cessation support, pharmacotherapies and announcements in local media*. **Stillman 1990 [+]** in the USA reported a significant decline in staff smoking prevalence from 8 months pre- to 6 months post-implementation of a local (hospital board's) smokefree buildings policy (p=0.0001). ***Supporting strategies*** *included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees*. Following implementation of national indoor smokefree legislation in Spain in 2005, **Martinez 2008 [+]** in Spain found a non-significant decrease in employee smoking prevalence from 4 years before the smokefree legislation (95% CI: 27.7-41.2) to 1 year after the legislation (95% CI: 24.7-36.4). ***Supporting strategies*** *included the closure of smoking rooms and staff training*.

(b) Staff Smoking by Number of Cigarettes: There is **moderate** evidence from three before and after studies, two in the USA (**Hudzinski 1990 [USA +], Daughton 1992 [-]**) and one in Israel (**Donchin 2004 [+]**), and one interrupted time series in Spain (**Martinez 2008 [+]**) to suggest that local-level policy and national legislation for smokefree implementation with supporting strategies **decreases** the number of cigarettes smoked by staff both during working hours and overall in an **acute and maternity setting**. **Hudzinski 1990 [+]** in the USA reported a decrease in the number of cigarettes staff reported smoking from 6 months pre- to 6 months post-implementation of a local (medical foundation's) smokefree (campus) buildings and grounds policy (data not reported). ***Supporting strategies*** *included a Smoke-Free Task Force (with clinicians, psychologists, and administrative personnel from public affairs and employee relations departments)*. **Donchin 2004 [+]** in Israel reported no change in the mean number of cigarettes smoked, either in during work hours or in total following the implementation of a local (hospital board's) smokefree buildings policy, measured 3 months before and 6-9 months after implementation. ***Supporting strategies*** *included an implementation committee, cessation support, smoking shelters erected outside the hospital building, bans on the sale of tobacco products on site, an information campaign 2 months before the policy was introduced, a press conference launch and fines for violations*. Following implementation of a local (hospital's) smokefree buildings policy, **Daughton 1992 [-]** in the USA reported a significant decrease in mean cigarette consumption during work hours (p<0.0001), during workdays (p<0.001) and during non-workdays (p<0.01) by staff between 5 months and 17 months post-implementation. The significant decrease in mean cigarette consumption mostly occurred amongst staff self-reported as moderate to heavy smokers (≥10 cigs/day) (p<0.001); Light smokers (<10 cigs/day) day) showed

only a slight decrease in mean daily cigarette consumption (p<0.05). ***Supporting strategies*** *included an implementation committee, employee bulletins and newsletters, cessation support and an in-house media campaign*. After the implementation of national indoor smokefree legislation in Spain in 2005, **Martinez 2008 [+]** in Spain reported a non-significant increase in the number of employees self-reporting they smoked <10 cigs/day after the implementation 1 year after the legislation (95% CI: 35.3-60.7) compared with 4 years before (95% CI: 24.8-51.19). There was a non-significant decrease in the number of employees who smoked 10-20 cigs/day and a non-significant increase in those who smoked >20 cigs/day 1 year after the legislation (95% CI: 24.6-49.3 and 95% CI: 5.1-22.8 respectively) compared with 4 years before (95% CI: 47.7-74.3 and 95% CI: 0.7-13.2 respectively). ***Supporting strategies*** *included the closure of smoking rooms and staff training*.

Other Impacts on Staff: Staff Quitting Activity (Acute & Maternity)

Evidence statement 2.4: There is **inconsistent** evidence from two before and after studies from the USA **(Daughton 1992 [-], Hudzinski 1990 [+])**, and two interrupted time series, one from Spain (**Martinez 2008 [+])** and one from the USA (**Ripley-Moffitt 2010 [+])**, about the impact of local-level policy and national legislation for smokefree implementation with supporting strategies on staff quit attempts in an **acute and maternity setting**.

UK Applicability: This evidence was conducted outside the UK and the policy covered in three studies (indoor smokefree) is already national legislation in the UK, however the other study's policy is for smokefree grounds and buildings (a policy implemented in parts of the UK). There is no reason to believe the effect on staff is not applicable to the UK setting.

(a) Quit attempts: There is **inconsistent** evidence from two before and after studies from the USA (**Daughton 1992 [-], Hudzinski 1990 [+]**) and two interrupted time series, one in Spain (**Martinez 2008 [+]** and one in the USA (**Ripley-Moffitt 2010 [+]**), to suggest that smokefree implementation with supporting strategies decreases or has no effect on the number of quit attempts by staff.

Three studies found no change or a decrease post-implementation. **Hudzinski 1990 [+]** in the USA reported that the proportion of hospital staff smokers who reported that they intended to stop smoking if the institution implemented a policy was slightly higher than the proportion that staff who reported that they tried to stop smoking at six and 12 months post-implementation a local (medical foundation's) smokefree (campus) buildings and grounds policy. ***Supporting strategies*** *included a Smoke-Free Task Force (with clinicians, psychologists, and administrative personnel from public affairs and employee relations departments)*. Following implementation of a local (hospital's) smokefree buildings policy, **Daughton 1992 [-]** in the USA reported **no change** in the rate of staff smokers self-reporting trying to quit (around two-fifths) between 5 months and 17 months post-implementation. ***Supporting strategies*** *included an implementation committee, employee bulletins and newsletters, cessation support and an in-house media campaign*. Following implementation of national indoor smokefree legislation in Spain in 2005, **Martinez 2008 [+]** in Spain reported a non-significant decrease the proportion of hospital employee smokers reporting having attempted to quit smoking at least once from 4 years before the smokefree legislation (95% 95% CI: 52.0-76.0) to 1 year after the legislation (95% CI: 29.8-55.0). ***Supporting strategies*** *included the closure of smoking rooms and staff training*.

One study found an increase post-implementation. **Ripley-Moffitt 2010 [+]** in the USA reported an increase in current smokers self-reporting to have made a quit attempt in the preceding 6 months from the month pre-implementation of a local (hospital's) smokefree (campus) buildings and grounds policy to 6 months post-implementation, the proportion falling at 12 months post-

implementation but still a higher than before smokefree was in place. There was no change in the proportion of employees who currently smoked who reported plans to quit smoking in the next 30 days or 6 months across all three surveys; it was always higher than the proportion who made quit attempts. ***Supporting strategies*** *included posters, staff meetings, an employee newsletter and cessation support.*

(b) Successful quitting: There is **weak** evidence from one before and after study in the USA (**Daughton 1992 [-]**) and one interrupted time series in the USA (**Ripley-Moffit 2010 [+]**) to suggest that implementation of a local smokefree policy for buildings or buildings and grounds with supporting strategies does not change the proportion of staff who quit smoking. **Daughton 1992 [-]** in the USA found a similar quit rate for staff who remain smoke-free for ≥3 months in the year pre-policy, at 5 months post-policy and at 7 months post-policy. ***Supporting strategies*** *included an implementation committee, employee bulletins and newsletters, cessation support and an in-house media campaign.* **Ripley-Moffitt 2010 [+]** in the USA reported no change in the proportion of staff reporting that they had quit smoking in the previous 6 months at the month pre-implementation of a local (hospital's) smokefree (campus) buildings and grounds policy to those reporting at 6 months post-implementation. ***Supporting strategies*** *included posters, staff meetings, an employee newsletter and cessation support.*

Other Impacts on Staff: Staff Readiness to Quit (Acute & Maternity)

Evidence statement 2.5: There is **inconsistent** evidence from one before and after study in Israel (**Donchin 2004 [+]**) and one interrupted time series in Spain (**Martinez 2008 [+]**) that that smokefree implementation with supporting strategies may increase the number of staff smokers' readiness to quit in an acute or maternity care setting.

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the strategy's effect is not applicable to the UK setting.

Martinez 2008 [+] in Spain found a significant increase in hospital employee smokers expressing readiness to quit after the implementation of national indoor smokefree legislation in Spain in 2005 compared with before ($p<0.05$). ***Supporting strategies*** *included the closure of smoking rooms and staff training*. Whereas **Donchin 2004 [+]** in Israel reported an increase in staff smokers classified in the pre-contemplation stage, and a smaller decrease in those classified in the preparatory stage, following the implementation of a local (hospital board's) smokefree buildings policy, measured 3 months before and 6-9 months after implementation, indicating less readiness to quit. ***Supporting strategies*** *included an implementation committee, cessation support, smoking shelters erected outside the hospital building, bans on the sale of tobacco products on site, an information campaign 2 months before the policy was introduced, a press conference launch and fines for violations*. The evidence from **Donchin 2004 [+] in Israel** could be due to those who were most motivated to quit doing so as a result of smokefree, leaving the least motivated group; alternatively smokefree had an effect that made staff smokers less likely to want to quit.

Other Impacts on Staff: Employee Resignations and Hires (Acute & Maternity)

Evidence statement 2.6: There is **weak** evidence from one uncontrolled before and after study in the USA (**Wheeler 2007 [-]**) that implementation of a local (university hospital board's) policy for smokefree indoors and outdoors with **extensive** supporting strategies does not change the mean number of the number of employee resignations/terminations, the likelihood of employees leaving as a result of the policy, or the rate of new employee hired in an acute or maternity care setting.

UK Applicability: This evidence was conducted outside the UK, however the policy covers smokefree grounds and buildings (a policy implemented in parts of the UK) and there is no reason to believe the effect is not applicable to the UK setting.

Wheeler 2007 [-] in the USA found no discernible changes in mean employee resignations/terminations or new employee hires after implementation of a local (university hospital board's) policy for smokefree indoors and outdoors. More employees stated that they were likely to stay as a result of the policy or were unaffected by the policy than those who said they were likely to leave because of the policy. ***Supporting strategies*** *included written policies, an implementation committee, posters, staff meetings, letters in staff payslips, patient appointments letters, cessation support, pharmacotherapies and announcements in local media*.

Other Impacts on Patients: Inpatient Violent Incidents/Aggression (Mental Healthcare)

Evidence statement 3.1: There is **moderate** evidence from four before and after studies, three in the USA (**Hempel 2002 [+], Quinn 2000 [-], Haller 1996 [+])** and one in the UK **(Shetty 2010 [+]**) that smokefree implementation with supporting strategies may decrease or have no effect on inpatient verbal aggression in a mental healthcare setting. One cohort study in the USA (**Velasco 1996 [-]**) showed an immediate significant increase in verbal aggression, but this was not maintained in the long term.

UK Applicability: Evidence comes from one recent UK study but mostly from outside the UK. However nearly half the studies test smokefree grounds and buildings (a policy implemented in parts of the UK), the others test indoor smokefree already national legislation in the UK. There is no reason to believe the effect is not applicable to the UK setting.

In the USA, **Hempel 2002 [+]** reported a significant decline in verbal aggression in heavy smokers (≥19 cigs/day) ($Z = -2.12$, $p=0.034$) 4 weeks after implementation a local (hospital board's) smokefree (campus) buildings and smokefree grounds policy compared with 4 weeks prior to implementation. There were no significant changes for non-smokers, light smokers (1-9 cigs/day) and moderate smokers (10-18 cigs/day). ***Supporting strategies*** *included education for staff about potential withdrawal symptoms, and any tobacco products found on patients were seized.*

In the USA, **Quinn 2000 [-]** reported a significant decrease in verbal acts of aggression 1 month post-implementation of a local (hospital's) smokefree (campus) buildings and smokefree grounds policy compared to the month prior to implementation ($p<0.01$). ***Supporting strategies*** *included written policies, pharmacotherapy and patient education about smoking and tobacco addiction recovery.*

In the USA, **Haller 1996 [+]** reported a significant decrease in verbal aggression 1 month following a local (hospital's) smokefree buildings and smokefree grounds policy, an increase during the second month, and a return to pre-policy levels at 3 and 4 months following the policy's implementation

(p<0.01). **Supporting strategies** were pharmacotherapies, staff education to recognise and treat nicotine withdrawal and written information for patients.

In the UK, **Shetty 2010 [+]** reported a non-significant reduction in the number of recorded verbal aggression incidents by male patients from 3 months before implementing the national indoor smokefree legislation and a local (NHS Trust's) smokefree grounds policy, to 3 months after (P=0.9). Two male patients were involved in verbal outbursts attributed to nicotine withdrawal during the first month after implementation, however 12 months after implementation, there was no recorded verbal aggression directly related to nicotine withdrawal. ***Supporting strategies*** *were posters, group and individual cessation support, pharmacotherapies, closure of smoking rooms and staff training.*

In the USA, **Velasco 1996 [-]** reported that the mean number of verbal assaults during the 6-week period immediately after implementation of local (hospital's) smokefree buildings policy in 1991 was significantly higher than in the 6-week period before implementation (p<0.001). ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

Evidence statement 3.2: There is **inconsistent** evidence from six before and after studies in the USA (**Hempel 2002 [+], Quinn 2000 [-], Haller 1996 [+], Matthews 2005 [-])** and the UK (**Shetty 2010 [+], Cormac 2010 [+],**) two cohort studies in the USA (**Rauter 1997 [+], Velasco 1996 [-]**) and one interrupted time series in the USA (**Erwin 1991 [-]**) that smokefree implementation with supporting strategies may affect inpatient physical aggression in a **mental healthcare setting**.

UK Applicability: Evidence comes from two recent UK studies but mostly from outside the UK. However over half the studies test smokefree grounds and buildings (a policy implemented in parts of the UK), the others test indoor smokefree already national legislation in the UK. There is no reason to believe the effect is not applicable to the UK setting.

One before and after study in the UK (**Cormac 2010 [+]**) showed a significant increase in inpatient violent incidents for pre-implementation smokers 4 months after implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy compared with 4 months before implementation (p=0.01). There was no significant difference between pre-ban smokers assessed 1 month pre- and 1 month post-implementation. ***Supporting strategies*** *were pharmacotherapy, cessation support, staff training and patient surrender of smoking materials.*

Five studies that reported significance values found that smokefree implementation with supporting strategies either significantly decreases inpatient physical aggression (**Quinn 2000 [-]**), or has no significant effect on inpatient physical aggression (**Hempel 2002 [+]**, **Haller 1996 [+]**, **Matthews 2005 [-]**, **Velasco 1996 [-]**). Three further studies reported a non-significant decline in inpatient physical aggression (**Shetty 2010 [+]**, **Rauter 1997 [-]**) or a decline in inpatient physical aggression (without providing the p values) (**Erwin 1991 [-]**) in a **mental healthcare setting**.

One interrupted time series in the USA (**Erwin 1991 [-]**) reported a decline in the proportion of nursing staff reporting that they intervened verbally or physically to prevent a patient who demanded to smoke from harming self or others, between 1 week post-implementation and 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke*.

In the USA, **Hempel 2002 [+]** reported no significant changes in physical aggression in non-smokers or smokers 4 weeks after implementation a local (hospital board's) smokefree (campus) buildings and smokefree grounds policy compared with 4 weeks prior to implementation. ***Supporting strategies*** *included education for staff about potential withdrawal symptoms, and any tobacco products found on patients were seized.*

In the USA, **Quinn 2000 [-]** reported a significant decrease in physical acts of aggression 1 month post-implementation of a local (hospital's) smokefree (campus) buildings and smokefree grounds policy compared to the month prior to implementation ($p<0.01$). ***Supporting strategies*** *included written policies, pharmacotherapy and patient education about smoking and tobacco addiction recovery.*

In the UK, **Shetty 2010 [+]** reported a non-significant reduction in the number of recorded physical aggression incidents by male patients from 3 months before implementing the national indoor smokefree legislation and a local (NHS Trust's) smokefree grounds policy, to 3 months after ($P=0.6$). ***Supporting strategies*** *were posters, group and individual cessation support, pharmacotherapies, closure of smoking rooms and staff training.*

In the USA, **Haller 1996 [+]** reported no significant change in physical aggression against other people or physical aggression against objects occurred over the 1 month preceding the local (hospital's) smokefree buildings and smokefree grounds policy or the 4 months following its implementation. There was a significant increase in physical aggression against self during the second month post-policy and a decrease to pre-policy levels at 3 and 4 months following the policy's implementation ($p<0.01$). ***Supporting strategies*** *were pharmacotherapies, staff education to recognise and treat nicotine withdrawal and written information for patients.*

In the USA, **Matthews 2005 [-]** reported no significant differences between the number of episodes or total number of patients who committed at least 1 episode of assault or self-harm in the 3 months before and 3 months after the local (hospital's) smokefree buildings policy was implemented. ***Supporting strategies*** *included patient education about nicotine addiction and withdrawal and pharmacotherapies.*

In the USA, **Rauter 1997 [-]** reported a decrease in the average monthly assault rate for the first three months of the implementation of a local (hospital's) smokefree buildings policy when compared to the same time 1 year previously. ***Supporting strategies*** *included smoking reduction workshops and patients wishing to participate were urged to do so.*

In the USA, **Velasco 1996 [-]** reported no significant change in the mean number of physical assaults between any of the three time periods: 6 weeks immediately before implementation of the local (hospital's) smokefree buildings policy, 6 weeks immediately after the 1991 ban, and the 1993 follow up. ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

Other Impacts on Patients: Inpatient Seclusion and Restraint (Mental Healthcare)

Evidence statement 3.3: There is **moderate** evidence from five before and after studies, one in the UK (**Cormac 2010 [UK +])** and four in the USA **(Haller 1996 [+], Hempel 2002 [+], Matthews 2005 [-], Patten 1995 [+]**), and one interrupted time series in the USA (**Erwin 1991 [-]**) that the introduction of smokefree in mental healthcare settings decreases or has no significant effect on incidents of

inpatient seclusion and restraint. One poor quality cohort study in the USA (**Velasco 1996 [-]**) showed a significant increase for soft restraints but no difference for leather restraints.

UK Applicability: Evidence comes from one recent UK study but mostly from outside the UK. However over half the studies test smokefree grounds and buildings (a policy implemented in parts of the UK), the others test indoor smokefree already national legislation in the UK. The use of mechanical or physical restraints is not a first-line response in the UK and so this is of limited applicability in the UK.

Cormac 2010 [+] in the UK found no significant results for comparisons of the numbers of seclusions between pre-ban smokers or non-smokers or all patients for between 1 month before and 1 month after implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy, nor between 4 months before and 4 months after implementation. ***Supporting strategies*** *were pharmacotherapy, cessation support, staff training and patient surrender of smoking materials.*

Haller 1996 [+] in the USA reported no significant changes in the proportion of patients who were secluded or the proportion of patients who were restrained over the 1 month preceding the local (hospital's) smokefree buildings and smokefree grounds policy or the 4 months following its implementation. ***Supporting strategies*** *were pharmacotherapies, staff education to recognise and treat nicotine withdrawal and written information for patients.*

Hempel 2002 [+] in the USA reported no significant changes in mean instances per week of seclusion or restraint in non-smokers or smokers 4 weeks after implementation a local (hospital board's) smokefree (campus) buildings and smokefree grounds policy compared with 4 weeks prior to implementation. ***Supporting strategies*** *included education for staff about potential withdrawal symptoms, and any tobacco products found on patients were seized.*

Matthews 2005 [-] in the USA reported no significant differences between the total number of patients who required seclusion or restraint in the 3 months before and 3 months after the local (hospital's) smokefree buildings policy was implemented. ***Supporting strategies*** *included patient education about nicotine addiction and withdrawal and pharmacotherapies.*

One before and after study in the USA (**Patten 1995 [+]**) found no significant change in the use of restraints between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy ($p=0.175$). Seclusion rates, however, were significantly lower post-implementation ($p<0.05$). ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence*.

One interrupted time series in the USA (**Erwin 1991 [-]**) reported little change in nursing staff reporting that they had encouraged room "time outs" to decrease stimulation, between 1 week post-implementation and 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke*.

In the USA, **Velasco 1996 [-]** reported that the number of applications of soft restraints was significantly higher during the 1993 follow up period than during the period before implementation of the local (hospital's) smokefree buildings policy ($p<0.001$). The mean number of leather wrist or ankle bindings did not change significantly between any of the three time periods; 6 weeks

immediately before and after implementation of the policy and the 1993 follow up. ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

Other Impacts on Patients: Security Calls (Mental Healthcare)

Evidence statement 3.4: There is **weak** evidence from one cohort study in the USA (**Velasco 1996 [-]**) that recorded security calls (for help from security officers) may not increase with the introduction of smokefree in mental healthcare settings.

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the strategy's effect is not applicable to the UK setting.

In the USA, **Velasco 1996 [-]** reported no significant change in the mean number if security calls for help from security officers between any of the three time periods: 6 weeks immediately before implementation of the local (hospital's) smokefree buildings policy, 6 weeks immediately after the 1991 ban, and the 1993 follow up. ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

Other Impacts on Patients: Inpatient Medication Changes (Mental Healthcare)

Evidence statement 3.5: There is **inconsistent** evidence from five before and after studies, two in the UK (**Cormac 2010 [+], Shetty 2010 [+])** and three in the USA **(Haller 1996 [+], Hempel 2002 [+], Patten 1995 [+]**), one interrupted time series in the USA (**Erwin 1991 [-]**) and one cohort study in the USA (**Velasco 1996 [-]**) that the introduction of smokefree legislation may change the required doses of inpatient PRN medication. Five before and after studies, two in the UK (**Cormac 2010 [+], Shetty 2010 [+])** and three in the USA **(Haller 1996 [+], Hempel 2002 [+], Patten 1995 [+]**), and one interrupted time series in the USA (**Erwin 1991 [-]**) suggest that required doses of inpatient PRN medications do not change or may decrease, whereas one cohort study in the USA (**Velasco 1996 [-]**) suggests that required doses of inpatient PRN medications for agitation and aggression may increase with the introduction of smokefree in mental healthcare settings.

UK Applicability: Evidence comes from two recent UK studies but mostly from outside the UK. However over half the studies test smokefree grounds and buildings (a policy implemented in parts of the UK), the others test indoor smokefree already national legislation in the UK. There is no reason to believe the effect is not applicable to the UK setting.

In the UK, **Cormac 2010 [+]** found a significant decline in mean dose of regular antipsychotic medication for smokers from 1 month before to 1 month after (95% CI 0.37-5.42; p=0.025) implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy. Other results were not significant for comparisons of mean dose of regular or PRN antipsychotics or benzodiazepines between pre-ban smokers or non-smokers for the 1 month pre-post or the 4 month pre-post comparisons. ***Supporting strategies*** *were pharmacotherapy, cessation support, staff training and patient surrender of smoking materials.*

One interrupted time series in the USA (**Erwin 1991 [-]**) reported a reduction in the number of patients offered PRN medications, between 1 week post-implementation and 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke*.

In the USA, **Haller 1996 [+]** reported no significant changes in the proportion of patients who

received PRN medications over the 1 month preceding the local (hospital's) smokefree buildings and smokefree grounds policy or the 4 months following its implementation. ***Supporting strategies*** *were pharmacotherapies, staff education to recognise and treat nicotine withdrawal and written information for patients.*

In the USA, **Hempel 2002 [+]** reported no significant changes in mean instances per week of PRN for agitation and aggression in non-smokers or smokers 4 weeks after implementation a local (hospital board's) smokefree (campus) buildings and smokefree grounds policy compared with 4 weeks prior to implementation. ***Supporting strategies*** *included education for staff about potential withdrawal symptoms, and any tobacco products found on patients were seized.*

In the UK, **Shetty 2010 [+]** reported a non-statistically significant change in rates of PRN tranquilisers for male patients from 3 months before implementing the national indoor smokefree legislation and a local (NHS Trust's) smokefree grounds policy, to 3 months after (p=0.6 for lorazepam and p=0.4 for haloperidol). ***Supporting strategies*** *were posters, group and individual cessation support, pharmacotherapies, closure of smoking rooms and staff training.*

One before and after study in the USA (**Patten 1995 [+]**) reported no significant differences in total PRN medication use (p=0.249) or in the percentage of patient days with PRN medication (p=0.166) between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy. ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence*.

In the USA, **Velasco 1996 [-]** reported that the use of PRN medication for anxiety was significantly higher during the 6-week period immediately after implementation of local (hospital's) smokefree buildings policy in 1991 was significantly higher than in the 6-week period before implementation (p<0.06). ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

Evidence statement 3.6: There is evidence from two before and after studies in the UK (**Cormac 2010 [+]**), **Shetty 2010 [+]**) about the impact of smokefree legislation on inpatient antipsychotic medication in a **mental healthcare setting**.

UK Applicability: The evidence comes from two recent UK studies thus is highly applicable.

There is **weak** evidence from one before and after study in the UK **(Cormac 2010 [+]**) that required doses of antipsychotic medication significantly decreases with the introduction of a national indoor smokefree legislation and local (NHS Trust's) smokefree grounds policy *(95% CI 0.37-5.42; p=0.025)*.

In the UK, **Cormac 2010 [+]** found a significant decline in mean dose of regular antipsychotic medication for smokers from 1 month before to 1 month after (95% CI 0.37-5.42; p=0.025) implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy. Other results were not significant for comparisons of mean dose of regular or PRN antipsychotics between pre-ban smokers or non-smokers for the 1 month pre-post or the 4 month pre-post comparisons. ***Supporting strategies*** *were pharmacotherapy, cessation support, staff training and patient surrender of smoking materials.*

There is **weak** evidence from one before and after study in the UK (**Shetty 2010 [+]**) that serum levels of clozapine in male patients significantly increases with the introduction of smokefree *the* national indoor smokefree legislation and a local (NHS Trust's) smokefree grounds policy *(p=0.006)*.

In the UK, **Shetty 2010 [+]** reported a statistically significant increase in serum clozapine levels (p=0.006) for male patients from 3 months before implementing the national indoor smokefree legislation and a local (NHS Trust's) smokefree grounds policy, to 3 months after. ***Supporting strategies*** *were posters, group and individual cessation support, pharmacotherapies, closure of smoking rooms and staff training.*

Other Impacts on Patients: Inpatient Disruptive Behaviours (Mental Healthcare)

Evidence statement 3.7: There is **weak** evidence from one before and after study in the USA (**Hempel 2002 [+]**) that combined measures of inpatient disruptive behaviours decreases with the introduction of smokefree in mental healthcare settings, particularly amongst moderate and heavy smokers.
Instances of PRN for agitation, PRN for aggression, verbal aggression, physical aggression, loss of privileges, and restraint and seclusion were combined to give a total for instances of inpatient 'disruptive behaviours'. Overall, there was a significant post-ban local (hospital board's) smokefree (campus) buildings and smokefree grounds policy decline in inpatient disruptive behaviours among the moderate smokers, Z = -2.24 p=0.025 and heavy smokers, Z = -2.71, p=0.007. There were no significant post-ban changes in inpatient disruptive behaviours among the non-smokers or light smokers. ***Supporting strategies*** *include provision of education to staff about potential withdrawal symptoms, and any tobacco products found on patients were seized.*

UK Applicability: This evidence was conducted outside the UK however the study tests smokefree grounds and buildings (a policy implemented in parts of the UK). There is no reason to believe the strategy's effect is not applicable to the UK setting.

Other Impacts on Patients: Patient Admittance and Length of Stay or Attendance (Mental Healthcare)

Evidence statement 3.8: Impact of smokefree legislation on patient admission and inpatient length of stay/outpatient length of attendance in a mental healthcare setting
There is evidence from three before and after studies in the USA (**Haller 1996 [+], Patten 1995 [+], Rees 2008 [+]**), one randomised controlled trial in the USA (**Kempf 1996 [+]**) and two cohort studies in the USA (**Sterling 1994 [-], Velasco 1996 [-]**) about the impact of smokefree legislation on patient admission and inpatient length of stay/outpatient length of attendance in a **mental healthcare setting**.

UK Applicability: This evidence was conducted outside the UK. Some of the studies test smokefree grounds and buildings (a policy implemented in parts of the UK), the others test indoor smokefree already national legislation in the UK. The age of the studies and the specific settings may not very applicable to the UK setting.

There is **moderate** evidence from one before and after study with inpatients in the USA (**Rees 2008 [+]**), one randomised controlled trial with inpatients in the USA (**Kempf 1996 [+]**) and one cohort study with outpatients in the USA (**Sterling 1994 [-]**) that the introduction of smokefree does not significantly impact on admission or retention to substance misuse treatment programmes.

In the USA, **Rees 2008 [+]** reported no significant changes in the number of admissions and patient demographics between the 12 months before and 12 months after implementation of a local (university hospital's) smokefree buildings policy in its inpatient medical detoxification unit. ***The***

supporting strategy *was that patients were informed of the indoor smoking ban as part of their admission screening process.*

In the USA, **Kempf 1996 [+]** reported that 2% of 105 adolescents randomly assigned to the tobacco-free residential programme based at the intervention campus, with a local (facility's) smokefree buildings and grounds (campus) policy, declined admission compared to 5% of 105 adolescents randomly assigned to the residential programme based at the control campus, with a smokefree buildings and designated outdoor areas policy. Pre-allocation, there was no significant difference between adolescents randomly assigned to either programme who declined admission (p=0.38). There was no significant difference between the two programmes for retention at 2 days (p=0.43) or retention at 2 weeks (p=0.37) Heavy smokers were significantly more likely to drop out in the first 2 days of treatment (p=0.005), although were equally likely to drop out of either programme (p=1.0). ***No supporting strategies*** *were reported.*

In the USA, **Sterling 1995 [-]** reported no significant change in neither the average number of daily new admissions per week, nor average number of outpatients attending groups per week between 1 and 3 months before and 1 and 3 months after the implementation of a local (facility's) smokefree buildings policy (p>0.05). ***Supporting strategies*** *were that outpatients were informed of the ban by a therapist and posters were displayed.*

There is **weak** evidence from one before and after study in the USA (**Rees 2008 [+]**) that reported a significant decrease in the length of patient stay between the 12 months before and 12 months after implementation of a local (university hospital's) smokefree buildings policy in its inpatient medical detoxification unit (p<0.05). The decrease was similar for patients who used tobacco and those who did not (p>0.10). ***The supporting strategy*** *was that patients were informed of the indoor smoking ban as part of their admission screening process.*

There is **strong** evidence from three before and after studies with inpatients in the USA (**Haller 1996 [+], Patten 1995 [+], Rees 2008 [+]**) and two cohort studies in the USA, one with outpatients (**Sterling 1994 [-]**) and one with inpatients (**Velasco [-]**), that the introduction of smokefree in mental health care settings does not significantly impact on the number of discharges against medical advice or patient attendance.

In the USA, **Haller 1996 [+]** reported no significant changes in the proportion of patients who were discharged against medical advice or in the proportion of patients who eloped over the 1 month preceding the local (hospital's) smokefree buildings and smokefree grounds policy or the 4 months following its implementation. ***Supporting strategies*** *were pharmacotherapies, staff education to recognise and treat nicotine withdrawal and written information for patients.*

One before and after study in the USA (**Patten 1995 [+]**) reported a non-significant increase in the number of patients who left against medical advice (p=0.500) between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy. ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence*.

In the USA, **Rees 2008 [+]** reported no significant changes in the rates of patients leaving the unit against medical advice, or transfers to other inpatient facilities among tobacco users (p>0.10) between the 12 months before and 12 months after implementation of a local (university hospital's) smokefree buildings policy in its inpatient medical detoxification unit. ***The supporting strategy*** *was that patients were informed of the indoor smoking ban as part of their admission screening process.*

In the USA, **Sterling 1995 [-]** reported no significant change in the proportion of outpatient premature terminators ('drop-outs') between 1 and 3 months before and 1 and 3 months after the implementation of a local (facility's) smokefree buildings policy (p>0.05). ***Supporting strategies*** *were that outpatients were informed of the ban by a therapist and posters were displayed.*

In the USA, **Velasco 1996 [-]** reported no significant change in the mean number of discharges against medical advice between any of the three time periods: 6 weeks immediately before implementation of the local (hospital's) smokefree buildings policy, 6 weeks immediately after the 1991 ban, and the 1993 follow up. ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

Other Impacts on Patients: Inpatient Complaint Investigations (Mental Healthcare)

Evidence statement 3.9: There is **moderate** evidence from one before and after study in the USA (**Patten 1995 [+]**) and one cohort study in the USA (**Rauter 1997 [+]**) that the introduction of smokefree in mental health care settings, results in a small number of formal complaints from inpatients about perceived violations of their right to smoke; complaints may be higher in number in the months immediately after implementation than 1 year later (**Rauter 1997 [+]**).

UK Applicability: This evidence was conducted outside the UK. One of the studies tests smokefree grounds and buildings (a policy implemented in parts of the UK), the other tests indoor smokefree already national legislation in the UK. Applicability to the UK could depend on the complaints structure for mental health inpatients in UK.

In the USA, **Rauter 1997 [-]** reported a decrease in formal inpatient complaints about smoking (from patients perceiving the smokefree building as a violation of their human rights) from the first 6 months of the implementation of a local (hospital's) smokefree buildings policy compared to the 1 year later. The majority from recently admitted patients ***Supporting strategies*** *included smoking reduction workshops and patients wishing to participate were urged to do so.*

In the USA, **Patten 1995 [+]** reported that only one female inpatient made a complaint related to a smoking issue 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy. No complaints were reported during the 3 months pre-implementation. ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence*.

Other Impacts on Patients: Inpatient Smoking and Quitting Behaviours (Mental Healthcare)

Evidence statement 3.10: There is **inconsistent** evidence from two before and after studies (one with a control group in the USA (**Joseph 1993 [+]**) and one uncontrolled in Switzerland (**Etter 2008 [+]**) that the introduction of smokefree in mental health care settings impacts on inpatient smoking and cessation behaviour outcomes in mental healthcare settings. There was no significant change in psychiatric inpatients' mean cigarette consumption or smoking prevalence in Switzerland (**Etter 2008 [+])** but in the USA **Joseph 1992 [+]** found significantly more male inpatients in substance abuse treatment quit for ≥1 week after discharge in the local (facility's) smokefree buildings policy (with supporting strategies) intervention group than the control group without smokefree premises.

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the effect is not applicable to the UK setting.

In the USA, **Joseph 1992 [+]** reports there were no significant differences between the proportion of smokers in the control group, admitted pre-implementation of the local (facility's) smokefree buildings policy), and the intervention group, admitted post-implementation, who reported currently smoking 'more', 'the same' or 'less' compared with smoking at admission 8-21 months earlier. A significantly higher proportion of the intervention group reported to have quit smoking for at least 1 week after discharge compared the control group (p=0.02). ***Supporting strategies*** *were that patients were informed of the policy and cessation programme prior to admission, and were required to agree in writing to nicotine abstinence during the treatment*.

From 2 years pre- to 1 year post-implementation of a local (hospital administration's) smokefree buildings policy in Switzerland, **Etter 2008 [+]** reported no significant change in the cigarette consumption or smoking prevalence in the clinic of inpatients who smoked (p=0.81) and no significant change in smoking prevalence since admission to the clinic of inpatients who smoked. One year post-implementation, 2% fewer inpatients who smoked reported smoking more in the clinic than before admission compared with 2 years pre-implementation. ***Supporting strategies*** *included signage, cessation support, pharmacotherapies, closure of smoking rooms and staff training*.

Other Impacts on Patients: Long Term Smoking Cessation (Mental Healthcare)

Evidence statement 3.11: There is **moderate** evidence from one before and after study in the USA (**Patten 1995 [+]**) and one cohort study in the USA (**Joseph 1992 [+]**) that the introduction of smokefree with appropriate supporting strategies in mental health care settings minimal impact on long term smoking cessation.

UK Applicability: This evidence was conducted outside the UK and the policy covered in one study (indoor smokefree) is already national legislation in the UK, however the other study's policy is for smokefree grounds and buildings (a policy implemented in parts of the UK). There is no reason to believe the effect is not applicable to the UK setting.

In the USA, **Patten 1995 [+]** reported that amongst a sub-sample of patients who were current smokers at admission during the first 3 months of a local (hospital board's) smokefree buildings and smokefree grounds policy, then followed up 16-18 months post-discharge, all reported resuming smoking immediately after hospital discharge although 2 patients reported not smoking at 6 months and 12 months after discharge. ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence*.

Joseph's 1993 [+] study in the USA reported that among the n=152 patients who smoked at admission (from retrospective viewing of chart data), ten self-reported they were not current smokers at the follow-up interview (8-21 months after discharge); n=3 from the control (pre-implementation of the local (facility's) smokefree buildings policy) group and n=7 from the intervention (post-policy implementation) group. ***Supporting strategies*** *were that patients were informed of the policy and cessation programme prior to admission, and were required to agree in writing to nicotine abstinence during the treatment*.

Other Impacts on Patients: Inpatient Prescriptions For or Use of NRT (Mental Healthcare)

Evidence statement 3.12: Impact of smokefree legislation on patient use of smoking cessation support in a mental healthcare setting
There is evidence from three before and after studies, one in the UK (**Cormac 2010** [+]), one in Switzerland **(Etter 2008 [+])** and one in the USA **(Patten 1995 [+]**), one interrupted time series in the USA (**Erwin 1991 [-]**) and one cohort study in the USA (**Velasco 1996 [-]**) about the impact of smokefree legislation on inpatient use of smoking cessation support in a **mental healthcare setting.**

UK Applicability: Evidence comes from one recent UK study but mostly from outside the UK. However the policy covered in most of the other studies (indoor smokefree) is already national legislation in the UK, however the one study's policy is for smokefree grounds and buildings (a policy implemented in parts of the UK). There is no reason to believe the effect is not applicable to the UK setting.

There is **moderate** evidence from two before and after studies, one in the UK (**Cormac 2010 [+]** and one in Switzerland **(Etter 2008 [+]**), and one cohort study in the USA (**Velasco 1996 [-]**) that the introduction of smokefree, particularly when including cessation support and pharmacotherapy as supporting strategies, increases the amount of NRT dispensed or received by inpatients. There is **inconsistent** evidence from two before and after studies, one in Switzerland (**Etter 2008 [+]** and one in the USA **(Patten 1995 [+]**), and one interrupted time series in the USA (**Erwin 1991 [-]**) on the impact of smokefree on inpatient use of cessation support during hospitalisation.

One before and after study in the UK (**Cormac 2010 [+]**) reported an increase in inpatients who commenced NRT after implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy (no further details are reported). ***Supporting strategies*** *were pharmacotherapy, cessation support, staff training and patient surrender of smoking materials.*

From 2 years pre- to 1 year post-implementation of a local (hospital administration's) smokefree buildings policy, **Etter 2008 [+]** in Switzerland reported a significant increase in the inpatients who smoked reporting that during their current stay a physician or nurse provided medication (like a patch, gum or Zyban) to quit smoking ($p<0.001$), no significant change in those reporting that staff advised them to quit smoking ($p=0.006$) or helped them to quit smoking ($p=0.015$). Staff reported that the proportion of inpatients to whom NRT was provided significantly increased 2 years pre- to 1 year post implementation ($p<0.001$, OR 4.0, 95% CI 1.6-9.9) and the proportion of inpatients to whom help was provided to quit smoking significantly increased from 1 year pre- to 1 year post-implementation ($p=0.007$, OR 3.8, 95% CI 1.6-9.3). ***Supporting strategies*** *included signage, cessation support, pharmacotherapies, closure of smoking rooms and staff training*.

One interrupted time series in the USA (**Erwin 1991 [-]**) reported a decline in nursing staff reporting that they had encouraged inpatients to participate in smoking cessation groups, between 1 week post-implementation and 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke*.

In the USA, **Patten 1995 [+]** reported no change in the number of inpatient consultations to the Nicotine Dependence Centre between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy. ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups,*

pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence.

In the USA, **Velasco 1996 [-]** reported that the number of inpatients who received NRT during the 6-week period immediately after implementation of local (hospital's) smokefree buildings policy in 1991 and during the 1993 follow up was significantly higher than in the 6-week period before implementation (p<0.001). ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

Other Health Impacts on Patients (Mental Healthcare)

Inpatient Sick Calls (Mental Healthcare)
Inpatient Acuity Level (Mental Healthcare)
Inpatient Seizure Rates (Mental Healthcare)

Evidence statement 3.13: There is **weak** evidence from one before and after study in the USA (**Hempel 2002 [+]**) that implementation of a local smokefree buildings and smokefree grounds policy with supporting strategies results in a decline in the number of inpatient sick calls (for a physical complaint) for moderate and heavy smokers immediately following implementation in a mental healthcare setting.

UK Applicability: This evidence was conducted outside the UK, however the policy covers smokefree grounds (a policy implemented in parts of the UK) and there is no reason to believe the effect is not applicable to the UK setting.

In the USA, **Hempel 2002 [+]** reported a significant post-implementation decline in inpatient sick calls for moderate smokers (10-18 cigs/day) (p=0.038) and for heavy smokers ((≥19 cigs/day) (p=0.008) 4 weeks after policy implementation compared with 4 weeks prior to implementation. There were no significant changes for non-smokers and light smokers (1-9 cigs/day). ***Supporting strategies*** *included education for staff about potential withdrawal symptoms, and any tobacco products found on patients were seized.*

Evidence statement 3.14: There is **weak** evidence from one cohort study in the USA (**Rauter 1997 [+]**) that implementation of a local (hospital's) smokefree buildings policy with supporting strategies significantly decreases mean inpatient acuity levels, as recorded daily by nurses, between the pre-implementation period and 9 months post-implementation in a mental healthcare setting (p=0.03). ***Supporting strategies*** *included smoking reduction workshops and patients wishing to participate were urged to do so.*

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the effect is not applicable to the UK setting.

Evidence statement 3.15: There is **weak** evidence from one before and after study in the USA (**Rees 2008 [+]**) that a local (university hospital's) smokefree buildings policy in its inpatient medical detoxification unit with supporting strategies does not significantly change inpatient seizure rates in a mental healthcare setting, when seizure rates were measured during the 12 months before and 12 months after implementation. ***The supporting strategy*** *was that patients were informed of the indoor smoking ban as part of their admission screening process.*

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the effect is not applicable to the UK setting.

Other Impacts on Staff: Staff Absenteeism

Evidence statement 3.16: There is **weak** evidence from one before and after study in the USA (**Matthews 2005 [-]**) that implementation of a local (hospital's) smokefree buildings policy with supporting strategies has no significant effect on staff absenteeism in a mental healthcare setting.

In the USA, **Matthews 2005 [-]** reported no significant differences in staff absenteeism between the 3 months before and 3 months after the local (hospital's) smokefree buildings policy was implemented. ***Supporting strategies*** *included patient education about nicotine addiction and withdrawal and pharmacotherapies.*

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. It is unlikely to be applicable.

Contents

1. Introduction

The National Institute for Health and Clinical Excellence (NICE) has been requested by the Department of Health to develop two separate pieces of complementary guidance on:

- 'Smoking cessation in secondary care: acute and maternity services' (NICE, 2011a)
- 'Smoking cessation in secondary care: mental health services' (NICE, 2011b).

The guidance will address smokefree policies and smoking cessation and make recommendations on approaches to help secondary care commissioners, professionals and managers (including patients and service users and their family or carers, visitors and staff) in hospitals and other acute, maternity or mental healthcare settings (including emergency care, planned specialist medical care or surgery, and maternity care provided in hospitals, outpatient clinics, community outreach and rural units, as well as intensive services in psychiatric units and secure hospitals).

There are **five components** of work associated with the guidance development that the CPHE has commissioned:

1. Smoking cessation in acute and maternity services: one review of effectiveness and one review of barriers and facilitators (Reviews 2 & 3)
2. Smoking cessation in mental health services: one review of effectiveness and one review of barriers and facilitators (Reviews 4 & 5)
3. **Smokefree strategies and interventions in secondary care settings: one review of effectiveness and one review of barriers and facilitators (Reviews 6 & 7)**
4. An economic analysis (Cost Effectiveness Review and Economic Model)
5. Review of effects of nicotine in secondary care (Review 1).

This systematic review is Review 6 for Component 3.

1.1 Background and rationale

Awareness of the dangers of second hand smoke (SHS) exposure has been accumulating since the 1970s and it is now well established that SHS causes death and disease (IARC, 2004). Indeed in 2002, the World Health Organization declared that SHS was a human carcinogen (WHO, 2005).

For these reasons smokefree policies and legislation have now been introduced in a number of countries including the UK. The White Paper 'Choosing health: making healthier choices easier' (Department of Health 2004) set a requirement for the NHS to become smoke-free by the end of 2006.

In the UK, the implementation of national legislation varied slightly by country. The Health Act 2006[1] was passed on 16th July 2006 and required that all indoor and substantially enclosed outdoor workplaces and public places in England and Wales became smoke-free by 1st July 2007, specifically banning smoking tobacco. In March 2007, residential mental health settings were given a temporary one year exemption from the implementation date, thus were required to become smoke-free by 1st

[1] *The Health Act 2006 (c.28)*. Online http://www.legislation.gov.uk/ukpga/2006/28/pdfs/ukpga_20060028_en.pdf

July 2008[2]. In Northern Ireland, the Smoking (Northern Ireland) Order 2006[3] was made on the 14th November 2006, and enacted as being against the law to smoke in enclosed and substantially enclosed workplaces and public places, and in certain vehicles from 30th April 2007. A temporary one year exemption for designated rooms in residential accommodation in mental health units (for patients 16 years and over) ceased to be in effect from 30th April 2008[4]. And in Scotland, the Smoking, Health and Social Care (Scotland) Act 2005[5] was passed on 30th June 2005, and established that, from 26th March 2006, it was an offence to smoke in any wholly or substantially enclosed public space in Scotland. Under the Act, no-smoking premises in Scotland include hospitals, hospices, psychiatric hospitals, psychiatric units and health care premises, however exemptions were put in place on 26th February 2006 for designated rooms in adult care homes, adult hospices and designated rooms in psychiatric hospitals and psychiatric units[6]. (Information regarding the legislative context for other countries is provided in Appendix 1).

The application of smokefree legislation to mental health units in England was legally challenged by three patients in 2008 on the basis that the legislation was incompatible with the human rights of patients detained under Mental Health Act 1983[7]. It was argued that preventing detained mental health patients from smoking, particularly those patients detained on a long-term basis and in mental health units where it is not feasible to permit patients to smoke outdoors, was a breach of Article 8 of the European Convention on Human Rights, the right to respect for private and family life, as the mental health facility could be considered to be their home. A High Court ruling established that smoking is not a basic human right, and did not uphold the patients' challenge[8].

Smokefree hospitals are a particularly important component of smokefree legislation because in addition to the links between SHS exposure and leading causes of death such as lung cancer and heart disease, evidence also exists of greater risk of preoperative and postoperative complications for smokers. These complications contribute to longer hospital stays and higher treatment costs (SCoTH, 2004). There is a significantly higher prevalence of smoking among people with mental health problems than among the general population (McNeill, 2001).

There is no legislative requirement for smokefree grounds in England and Wales, however many NHS secondary care settings have smokefree policies that apply to their grounds (as well as enclosed areas), although there have been problems with compliance and enforcement (Ratschen et al., 2009; Shipley and Allcock, 2008). Achieving smokefree environments in hospital buildings is challenging, as a number of studies have shown (Lawn and Pols, 2005; Kunyk et al., 2007). This is particularly the case for mental health facilities and for this reason not all psychiatric hospitals in the UK (most notably in Scotland) are smokefree. Variability also exists regarding the extent to which hospital grounds are covered by smokefree policies and the extent to which the introduction of smokefree is linked to services to stop smoking for patients and staff (Ratschen et al., 2009).

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[2] *The Smoke-free (Exemptions and Vehicles) Regulations 2007*. Statutory Instruments 2007 No. 765. Online: http://www.legislation.gov.uk/uksi/2007/765/pdfs/uksi_20070765_en.pdf

[3] *Smoking (Northern Ireland) Order 2006*. Statutory Instruments 2006 No.2957 (NI 20). Online: http://www.dhsspsni.gov.uk/ifh-smoking-ni-order-2007.pdf

[4] *The Smoke-free (Exemptions, Vehicles, Penalties and Discounted Amounts) Regulations (Northern Ireland) 2007*. Statutory Rules of Northern Ireland 2007 No. 138. Online: http://www.dhsspsni.gov.uk/ifh-smoke-free-_exemptions_-vehicles_-penalties-and-discounted-amounts_-regulations-2008.doc

[5] *The Smoking, Health and Social Care (Scotland) Act 2005 (asp 13)*. Online: http://www.legislation.gov.uk/asp/2005/13/pdfs/asp_20050013_en.pdf

[6] *The Prohibition of Smoking in Certain Premises (Scotland) Regulations 2006*. Scottish Statutory Instruments 2006 No.90. Online: http://www.legislation.gov.uk/ssi/2006/90/pdfs/ssi_20060090_en.pdf

[7] *Mental Health Act 1983 (c.20).* Online: http://www.legislation.gov.uk/ukpga/1983/20/pdfs/ukpga_19830020_en.pdf

[8] R (G) v Nottinghamshire Healthcare NHS Trust [2008] EWHC 1096 (Admin). Online: http://www.bailii.org/ew/cases/EWHC/Admin/2008/1096.html; R (N) v Secretary of State for Health; R (E) v Nottinghamshire Healthcare NHS Trust [2009] EWCA Civ 795. Online: http://www.bailii.org/ew/cases/EWCA/Civ/2009/795.html

Smokefree strategies and interventions in secondary care for ensuring compliance with smokefree legislation and local smokefree policies in secondary care settings include signage and enforcement in the grounds, staff residencies and inside hospitals; restrictions on staff smoking breaks; interventions that help people temporarily abstain from smoking whilst onsite; campaign and information materials to alert staff and service users of proposed and impending policy changes.

The aim of the study is to systematically review the effectiveness of smokefree strategies and interventions in secondary care settings (acute, maternity and mental health settings). Alongside a related systematic review of the barriers to and facilitators for implementing smokefree strategies and interventions in secondary care settings (acute, maternity and mental health settings) from the users' and the providers' perspectives, its purpose is to support the development by NICE of two separate pieces of complementary public health guidance: a) smoking cessation in secondary care: acute and maternity services, and b) smoking cessation in secondary care: mental health services. The reviews will provide the best available evidence on smokefree strategies and interventions in these settings.

1.2 Review questions

Question 1: How effective are strategies and interventions for ensuring compliance with smokefree legislation and local smokefree policies in secondary care settings?

- **Subsidiary question:** How does the effectiveness vary for different population groups, health status or speciality care services?

Question 2: Are there any unintended consequences from adopting smokefree approaches in acute and maternity care settings?

Question 3: Are there any unintended consequences from adopting smokefree approaches in mental healthcare settings?

The following sections of the review report on the methodology (Section 2); the review findings, structured around the review questions (Section 3); and the Discussion (Section 4). Lists of the included and excluded papers follow this. Finally, the seven appendices are in a separate document.

2. Methodology

The following methodological stages were conducted at the same time for Reviews 6 (Effectiveness) and 7 (Barriers and Facilitators): the search strategy, title and abstract screening, full text retrieval and full text screening stages. The process was then split for the subsequent stages of the two reviews, Review 6 being reported here.

2.1 Search strategy

Sensitive search strategies were developed using a combination of controlled vocabulary and free-text terms, by an information specialist in conjunction with the research team and peer-reviewed by information specialists at NICE. The search strategy was initially developed in MEDLINE and was then adapted to meet the syntax and character restrictions of each database. Searches were run in February 2012. All the literature searches were conducted from 1990 onwards. Sample search strategies can be found in Appendix 2.

The following databases were searched:

AMED (Allied and Complementary Medicine)
ASSIA (Applied Social Science Index and Abstracts)
British Nursing Index
CDC Smoking & Health Resource Library database
CINAHL (Cumulative Index of Nursing and Allied Health Literature)
Cochrane Central Register of Controlled Trials (includes the Cochrane Tobacco Addiction Group Specialist Register)
Cochrane Database of Systematic Reviews (CDSR)
Conference Papers Index (years: 2008-2012)
Database of Abstracts of Reviews of Effectiveness (DARE; 'other reviews' in CDSR database)
Database of Promoting Health Effectiveness Reviews (EPPI Centre DoPHER)
EMBASE
Health Evidence Canada
Health Technology Assessment (HTA) database in the CDSR database
HMIC
International Bibliography of Social Sciences
Medline, including Medline in Process
PsycINFO
Social Policy and Practice
Social Science Citation Index and Conference Proceedings Citation Index
Sociological Abstracts
Trials Register of Promoting Health Interventions (EPPI Centre TRoPHI)
UK Clinical Research Network Portfolio Database

The following websites were also searched for research papers relevant to the review questions (see also, Appendix 4):

Action on Smoking and Health (ASH) http://www.ash.org.uk
Association for the Treatment of Tobacco Use and Dependence (ATTUD) www.attud.org

Canadian Council for Tobacco Control*http://www.cctc.ca/cctc/EN/tcrc/articles/tcarticle.2010-12-24.4349020582
CDC tobacco control and prevention* http://www.cdc.gov/tobacco/
Current controlled trials www.controlled-trials.com
Globalink* http://www.globalink.org/
International Tobacco Control Policy Evaluation Project http://www.itcproject.org
International Union against Cancer http://www.uicc.org
Joseph Rowntree Foundation http://www.jrf.org.uk/publications
National Institute on drug abuse- the science of drug abuse and addiction http://www.nida.nih.gov/nidahome.html
NHS Centre for Smoking Cessation and Training http://www.ncsct.co.uk/
NHS Evidence https://www.evidence.nhs.uk/
NICE http://www.nice.org.uk/
Public health observatories http://www.apho.org.uk/resource/advanced.aspx
Scottish Government http://www.scotland.gov.uk/topics/research
Smoke free http://smokefree.nhs.uk
Society for Research on Nicotine and Tobacco http://www.srnt.org
Tobacco Harm Reduction http://www.tobaccoharmreduction.org/index.htm
Tobacco Information Scotland* http://www.tobaccoinscotland.com/page.cfm?pageid=71
Treat tobacco.net http://www.treatobacco.net/en/index.php
UK Centre for Tobacco Control Studies http://www.ukctcs.org/ukctcs/index.aspx
Welsh Government http://wales.gov.uk/
WHO Tobacco Free Initiative (TIF) http://www.who.int/tobacco/en
World Conference on Tobacco or Health abstracts from 2006, 2009, 2012 conferences* http://2006.confex.com/uicc/wctoh/techprogram; http://www.indianjcancer.com/article.asp?issn=0019-509X;year=2010;volume=47;issue=5;spage=109;epage=210;aulast=#Smokefree%20implementation%20and%20enforcement; http://wctoh2012.org
(*Searched in addition to those listed in Reviews 6 and 7's protocols.)

Electronic files of papers identified from Reviews 1, 2, 3, 4 and 5 that have potential relevance— supplied by those project teams— were also screened for eligibility. The bibliographies of other reviews identified by the search strategy were searched for further studies. As noted above, the World Conference on Tobacco or Health abstracts from the 2006, 2009 and 2012 conferences were searched online.

Studies were managed during the review using the EPPI-Centre's online review software EPPI-Reviewer version 4.0 (ER4) (Thomas et al., 2010). An initial de-duplication procedure was run using EndNote software before uploading the records to ER4.

2.2 Title and Abstract Screening

All records from the searches were uploaded into a database and duplicate records were removed. Where no abstract was available, a web search was first undertaken to locate one; if no abstract could be found, records were screened on title alone and full-text documents were retrieved where there was any doubt.

To trial the inclusion criteria, a pilot round of screening was conducted on a random selection of 30 document titles and abstracts. Piloting was conducted by three reviewers. A reconciliation meeting was then held to discuss disagreements and suggest changes to the inclusion criteria. An additional

three rounds of piloting, with random samples of 25, 25, and 113 records, respectively were conducted to further refine the criteria and achieve consensus. By the fourth round of piloting, a high level of agreement was achieved.

Following the pilot screening, 2,200 records (20%) were double screened. The agreement rate for double-screening was 98.3%, which was considered by the project team and NICE to be sufficiently high. As such, the remaining documents were split between the three reviewers who independently screened their allocated records. Of the double-screened items, any disagreements were resolved by a third reviewer. Throughout the entire process, the reviewers discussed difficult and ambiguous records to ensure consistency.

The final inclusion criteria for Reviews 6 and 7 are presented below (also see Appendix 3 for detailed guidance and definitions used for each criterion). The criteria were applied in a hierarchical manner.

1. The document must be published during or after 1990
2. The document must be published in English
3. The document must report on a piece of empirical research
4. The title and/or abstract must refer to smokefree strategies or interventions (including smoking bans, smoking reduction policies, or programs to reduce environmental tobacco smoke)
5. The study (or a component of it) must be conducted in a secondary care setting or with secondary care staff.
6. If the study is conducted in a community or private residence setting, it must explicitly refer to smokefree policies and be clearly relevant to secondary care workers or services in the title and/or abstract
7. The study design must involve a comparison (e.g. controlled trials, before-and-after) and/or views or process evaluation (e.g. interviews, surveys).

If the study met the above criteria and evaluated the effectiveness of an intervention, it was marked as relevant to Review 6. If the study met the above criteria and included evidence on barriers or facilitators (including knowledge, attitudes and beliefs) to using or implementing smokefree policy it was marked as relevant to Review 7.

After the title and abstract screening stage, full text documents were retrieved for the remaining records.

2.3 Full Text Screening

The retrieved full-text documents were all re-screened for relevance and applicability for inclusion in Review 6 and/or 7 on the basis of the detail available in the full-text article.

The full-text screening process was piloted using ten studies and refined using a further ten studies by four reviewers. Following this, the rest of the studies were divided between different pairings of the same four reviewers and all double-coded in batches. Early inter-rater consistency levels were below the agreed cut-off point, thus double-coding between different pairs maintained a more rigorous process. The reviewers met regularly to discuss uncertain inclusions for both Reviews 6 and 7, and disagreements were resolved by group discussion.

The final inclusion criteria for Review 6 (Effectiveness) are presented below (also see Appendix 5 for detailed guidance and definitions used for each criterion). The criteria were applied in a hierarchical manner and were the same as points 1 to 6, above, then:

7. The study must evaluate the effectiveness of one or more strategies or interventions to support compliance with or implementation of smokefree legislation or policies
8. The study design must involve a comparison (e.g. controlled trials, before-and-after studies or an interrupted time series)
9. Retrospective comparison studies which included self-report behaviour and/or perceptions of compliance post-implementation were excluded initially, as a less robust measure of effectiveness, but marked so they could be retrieved for Review 6 later if necessary.

The extent of evidence on the effectiveness of smokefree strategies was extremely limited, thus after consultation with the NICE Team, a re-screening of the studies marked as excluded on research design (including those marked as retrospective comparison studies) was conducted by the reviewers (also double-screened). The definition of smokefree was clarified and the following inclusion criteria were refined:

- The study must have a minimum of indoor smokefree in place, i.e. exclude studies with partial indoor bans (e.g. where smoking is permitted in a smoking room, area or cafeteria)
- As the UK has indoor smokefree legislation in place in secondary care settings at this time-point, studies with indoor smokefree must mention at least one supporting strategy to be included. If the smokefree policy in the study extends to smokefree grounds and other areas, supporting strategies are not necessarily required for inclusion
- Point 7, above, was broadened to include studies on the effects of smokefree legislation or policies.

The documents that passed the inclusion criteria on the basis of full-text screening were included in Review 6. See Figure 2.1 for the flow of literature through the review stages.

2.4 Data Extraction

Data were extracted into an evidence table using the template provided in the methods manual (NICE 2009). Included studies were shared among three reviewers, with the data extracted from the original paper by one reviewer and checked for accuracy by a second. Evidence tables for the included studies are presented in Appendix 7.

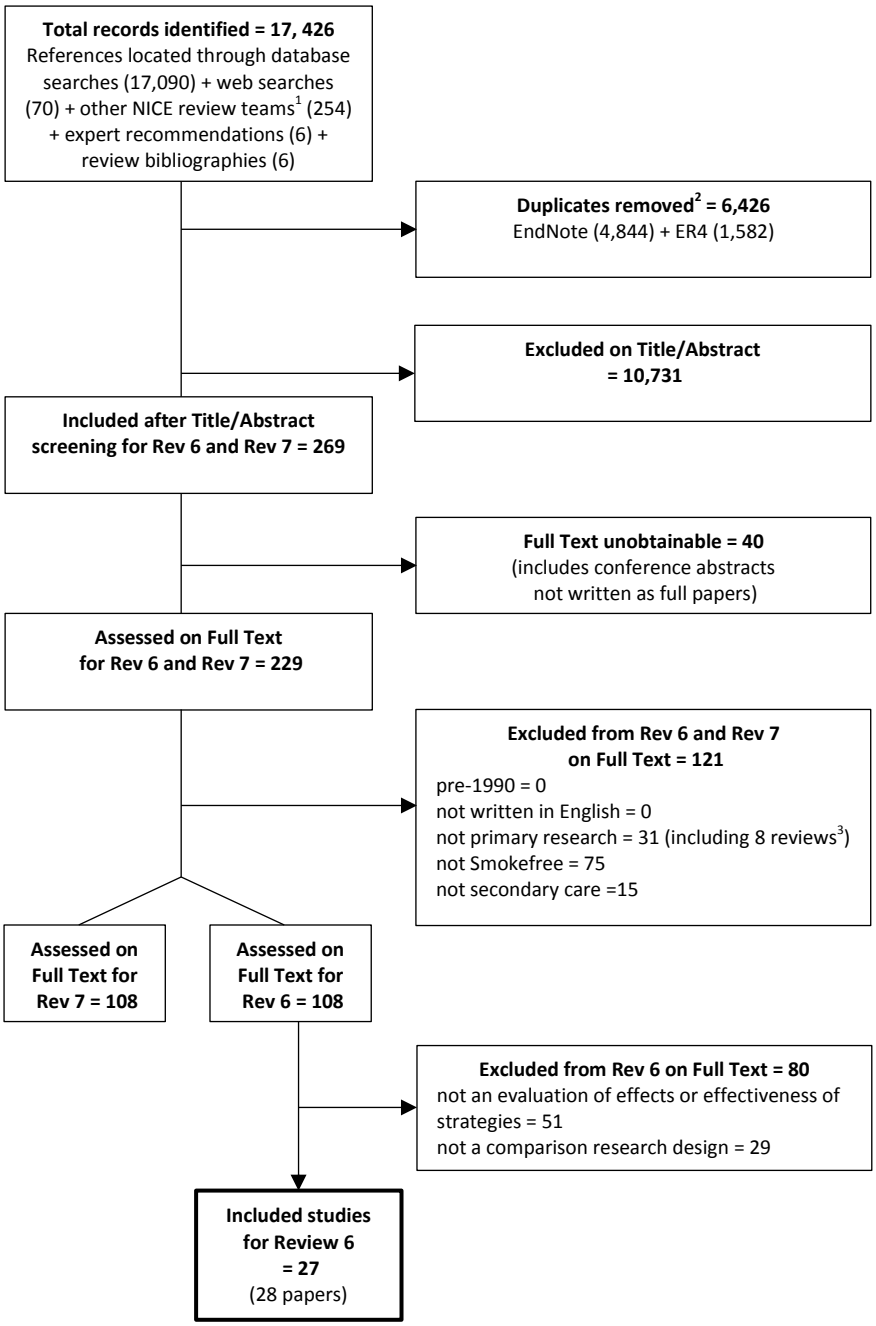

FIGURE 2.1: FLOW OF LITERATURE CHART

1. Teams conducting other reviews to inform guidance on smoking cessation in secondary care.
2. Including an initial de-duplication in EndNote before entering records into Eppi-Reviewer 4 (ER4).
3. Bibliographies' of the reviews were checked for additional relevant studies. Six new studies were identified for full text assessment (two of which were subsequently included in Review 7).

2.5 Quality Assessment

All the included full-text studies were rated for internal validity (whether the study's results were unbiased) and external validity (whether the study's findings were generalizable to the source population) using critical appraisal checklists provided in the methods manual (NICE 2009).

The quality assessment process was piloted with a pair of studies by four reviewers followed by discussions about completion. Each study was rated by one reviewer. Through the process of

synthesising the review findings the review team familiarised themselves with the details of all the included studies. Two members for the team then collaboratively considered, calibrated and finalised the scores, with disagreements resolved by a third reviewer.

Each item on the checklist was coded using the following ratings:

- **++** for that aspect, the study has been designed/conducted in such a way as to minimise the risk of bias
- **+** the answer is not clear from the way the study is reported, or that the study may not have addressed all potential sources of bias for that aspect
- **–** for those aspects of the study design in which significant sources of bias may persist
- **NR** not reported
- **NA** not applicable

For checklist items assessing applicability to the UK, studies were rated as applicable to the current UK setting in the quality appraisal checklist in the following way:

From the UK and published 2000 onwards (++)
From the UK and published pre-2000, non-UK but a high income economy country (+)
From outside the UK and a high income economy country but with a contrasting or country-specific setting (-)

The full critical appraisal checklists and the score for each checklist item for each study are given in Appendix 6. An overall quality grading score was assigned using the following ratings for internal validity and external validity:

- **++** All or most of the checklist criteria have been fulfilled, where they have not been fulfilled the conclusions are very unlikely to alter.
- **+** Some of the checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter.
- **–** Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

Both the internal and external validity scores are reported in the evidence tables and the internal validity score as part of each study's citation.

2.6 Synthesis Methods

Twenty-seven studies, published in English since 1990, were included in Review 6 to answer the review questions on the effectiveness of smokefree strategies and interventions in secondary care settings and any other consequences from their adoption in mental healthcare or acute and maternity healthcare settings.

Sample Characteristics

Thirteen studies were published between 1990 and 2000, 12 from the USA and one in 1996 from Australia (two from 1990, one from 1991, one from 1992, one from 1993, one from 1994, one from 1995, four from 1996, one from 1997 and one from 2000). Fourteen included studies were published in the last 12 years, the four most recent in 2010 (one from 2002, one from 2004, one from 2005, one from 2006, one from 2007, four from 2008, one from 2009 and four from 2010).

Twenty-six of the studies were published in academic or practitioner journals and one is an unpublished report (Kvern 2006 -).

Countries: Two of the included studies were from the UK, both in England (Cormac 2010 +, Shetty 2010 +), and a further four were from Europe, two from Spain (Fernandez 2008 +, Martinez 2008 +), and one from France (Vorspan 2009 +) and Switzerland (Etter 2008 +). The majority of included studies were conducted in the USA (Daughton 1992 -, Erwin 1991 +, Gadomski 2010 +, Haller 1996 +, Hempel 2010+, Hudzinski 1990+, Joseph 1993 +, Kempf 1996 +, Matthews 2005 -, Patten 1995 +, Quinn 2000 -, Rauter 1997 +, Rees 2008 +, Ripley-Moffitt 2010 +, Sterling 1994 -, Stillman 1990 +, Velasco 1996 -, Wheeler 2007 -); and there was one study from Canada (Kvern 2006 -), one from Australia (Nagle 1996 +) and one from Israel (Donchin 2004 +).

Study design: One of the included studies was a randomised controlled trial (Kempf 1996 +). The rest of the included studies were quantitative observational studies, only one had a concurrent control group in the study (Nagle 1996 +). Fernandez 2008 [+] was a before and after measurement of air vapour-phase nicotine; eleven were before and after studies with different samples at follow-up (Cormac 2010 +, Donchin 2004 +, Etter 2008 +, Haller 1996 +, Joseph 1993 +, Kvern 2006 -, Matthews 2005 -, Nagle 1996 +, Patten 1995 +, Rees 2008 +, Wheeler 2007 -); and seven studies were before and after studies with the same samples at follow-up (Daughton 1992 -, Erwin 1991 +, Hempel 2002+, Hudzinski 1990 +, Quinn 2000 -, Shetty 2010 +, Vorspan 2009 +). One before and after study (Gadomski 2010 +) used the same staff sample and a different patient sample before and after). Four were cohort studies ((Rauter 1997 +, Sterling 1994 -, Stillman 1990 +, Velasco 1996 -) and two were interrupted time series (Martinez 2008 +, Ripley-Moffitt 2010 +).

Secondary healthcare setting: Sixteen of the studies were conducted in a mental healthcare setting (Cormac 2010 +, Erwin 1991 +, Etter 2008 +, Haller 1996 +, Hempel 2010 +, Joseph 1993 +, Kempf 1996 +, Matthews 2005 -, Patten 1995 +, Quinn 2000 -, Rauter 1997 +, Rees 2008 +, Shetty 2010 +, Sterling 1994 -, Velasco 1996 -, Vorspan 2009 +). These studies were from four countries (France, Switzerland, UK and USA) and were published from 1991 to 2010, the early evidence all being from the USA and those from 2008 onwards from the other countries also.

Eleven studies were conduced in an acute and/or maternity healthcare setting (Daughton 1992 -, Donchin 2004 +, Fernandez 2008 +, Gadomski 2010 +, Hudzinski 1990 +, Kvern 2006 -, Martinez 2008 +, Nagle 1996 +, Ripley-Moffitt 2010 +, Stillman 1990 +, Wheeler 2007 -). These studies were from five different countries (Australia, Canada, Israel, Spain and USA) and were published from 1990 to 2010.

Patient population: Of the n=16 studies conducted in a mental healthcare setting, n=15 studies were at conducted at a facility for inpatients. Only one study (Sterling 1994 -) was for an outpatient program, and reports patient outcomes. Of the n=11 studies conducted in an acute or maternity secondary care setting, five studies report on patient outcomes. Nagle 1996 [+] and Donchin 2004 [+] report findings for all hospital users – staff, patients and visitors – without distinguishing between inpatients and outpatients. Studies by Gadmomski 2010 [+] and Kvern 2006 [-] report on findings for inpatients and Wheeler 2007 [-] reports bed occupancy rates, thus relevant to inpatients. The review's evidence statements refer to the evidence for inpatients and outpatients from these studies.

Type of ban: Thirteen of the studies were in secondary care settings that were implementing smokefree grounds, seven of these in a mental healthcare setting (Cormac 2010 +, Haller 1996 +, Hempel 2010, Kempf 1996 +, Patten 1995 +, Quinn 2000 -, Shetty 2010 +) and six of these in an acute and/or maternity healthcare setting (Gadomski 2010 +, Hudzinski 1990 +, Kvern 2006 -, Nagle 1996 +, Ripley-Moffitt 2010 +, Wheeler 2007 -). The other 14 studies were in settings that were implementing smokefree buildings policies or indoor smokefree legislation; the same level as the current smokefree legislative requirements of the UK.

Quality Scores

Twenty studies were rated as '+' for overall internal validity and seven studies were rated as '-' for overall internal validity. Nineteen studies were rated as '+' for external validity, four studies were rated as '-' and four studies were rated as '++' for external validity. See Appendix 6 for the quality scores for each study.

Narrative Synthesis

A narrative synthesis approach was adopted:

- Studies were first grouped according to their outcome measure for assessing compliance (to answer Research Question 1) and their outcome measures for assessing other consequences according to their secondary healthcare setting (to answer Research Questions 2 and 3).
- The key features of each study were described individually.
- Notable similarities and differences in methods or results across studies were described and interpreted.
- Evidence statements were devised.

Strength of Evidence

The strength of evidence rating for studies grouped together for an evidence statement was applied in the following way:

> **Weak evidence** – a single study (- or +); two studies (-- or - +); three studies (- - - or - - +) with the same direction of effect, or no change in effect.
> **Moderate evidence** – two studies (+ +); three studies (+ + -, + + +); four studies (- - + + or better) with the same direction of effect, or no change in effect.
> **Inconsistent evidence** – where two or more studies do not agree

2.7 Definitions & Outcomes Measured

Smokefree: the review uses the World Health Organization's FTCT definition of smokefree as "air that is 100% smoke free. This definition includes, but is not limited to, air in which tobacco smoke cannot be seen, smelled, sensed or measured" (FTCT 2008).

Indoor and/or Outdoor Smokefree terms used:

- *Indoor policies* – includes smokefree buildings, and vehicles where mentioned; "hospital smoking ban" was coded as an indoor policy.
- *Outdoor policies* – includes "smokefree grounds" and "smokefree campus". If is unclear from the use of 'campus' whether it covers indoor and outdoor, an assumption has been that 'campus' refers to both.
- *Local policy* – an indication is given for who instigated the policy e.g. hospital board, local health authority. Where this is unclear, 'hospital' is used.
- *National or state legislation* – for smokefree (indoor in all cases).

Table 2.1 Characteristics of smoke-free in studies in mental health settings and Table 2.2 Characteristics of smoke-free in studies in acute and maternity settings provided a summary for each study of the type of ban, its implementation stage (the most recent stage addressed in the study),

when it was assessed, the legislation, policy or other impetus for introducing smokefree in secondary care setting, and detail of the supporting strategies mentioned in the paper.

Settings: Throughout the report acute and maternity (non-mental health) secondary care settings are referred to as **Acute and Maternity Settings**; those in mental health secondary care settings are referred to as **Mental Health Settings**. It should be noted that some Acute and Maternity Settings may also include mental health services or wards, although this was not reported in the studies. For the purposes of the review they are referred to as Acute and Maternity Settings. Finally, no studies were identified that were set in a maternity setting.

In addition to the list of included outcomes below, tables are included at the beginning of each of the 3 findings sub-sections to summarise the outcome measures used in each study (Tables 3.1, 3.2 and 3.3).

Compliance Outcome Measures: Outcome measures for compliance with the smokefree policy or legislation in place in the secondary healthcare setting were not restricted at the screening stage and have all been included in the synthesis. Objective measures of compliance included: measures of atmospheric nicotine vapour as a proxy for environmental tobacco smoke; hospital records relating to incidences of patients' possession of smoking-related contraband, patients' violations of smokefree or fire incidents due to negligent smoking. Observation checklists to count smokers violating the smokefree policy, recorded security incidents and counts of cigarette butts were included as less objective compliance measures. Subjective measures of compliance included: self-reported compliance, observations of other people's compliance, self-reported challenges to smokefree violators, and perceived or actual exposure to environmental tobacco smoke.

Unintended Consequences Outcome Measures: 'Unintended consequences' have been interpreted in the review as 'other consequences'. Relevant outcomes, adverse or beneficial, were not restricted at the screening stage and have all been included in the synthesis. Measures of other outcomes in acute and maternity settings included: other consequences for patients such as smoking and cessation behaviours, use of cessation pharmacotherapies, signing out of hospital against medical advice, use of and attendance at acute hospitals; and other consequences for staff such as smoking and cessation behaviours, use of cessation pharmacotherapies; decrease work productivity, employee resignations, terminations and hires. Measures of other outcomes in mental healthcare settings included: other consequences for patients such as smoking and cessation behaviours, use of cessation pharmacotherapies, violent incidents/aggression, seclusion and restraint, medication changes, acuity levels, seizure rates, complaint investigations; and other consequences for staff such as absenteeism from work.

Table 2.1: Characteristics of smoke-free in studies in mental health settings

○ **Title** ○ **Study design** ○ **Acute and/or Maternity Setting** ○ **Type of ban** ○ **Implementation stage (the most recent stage addressed in the study)** ○ **When assessed**	**Legislation, policy or other impetus** *(As reported in the paper. If national legislation or a national or local policy is not cited in the article, other statements from the study are provided. All papers typically report the health risks to smokers and those around them in their introduction or literature review.)*	**Supporting strategies/ interventions**	**Sample size & characteristics**
Studies with Smokefree Grounds			
Kempf 1996 [USA +] **Randomised controlled trial** *The New Jersey Substance Abuse Treatment Campus, a 350 bed residential substance abuse treatment facility which incorporates a central intake unit and around the clock medical services.* **Intervention campus (18 month therapeutic community model):** Smokefree building(s) Smokefree doorways/entrances Smokefree grounds **Control campus (6 month chemical dependency model):** Smokefree building(s) *Designated outdoor areas for smoking* Smokefree in place: *(implementation date not reported)* After implementation – multiple time points: *Feb 94 – Feb 95*	"A primary **goal and responsibility of the treatment community** is to give patients the opportunity to recover from all their addictions, including nicotine addiction." [p.2]	Cessation support *Medical support for nicotine addiction available to all residents if nicotine abstinence is part of the addiction treatment plan*	Total sample *n=155 adolescents (figure cannot be broken down by random allocation to intervention or control)* Sample characteristics: *Age range 13-17 years, average 15.7 years; 82% male; 40% African-American, 32% Hispanic; 28% Caucasian; average highest school grade completed 8th; 41% have health insurance; 80% have an arrest record (other than traffic offences); 85% (n=132) smoke cigarettes, of these 25% smoke 1-5 cigs/day, 36% smoke a half pack (6-15 cigs)/day; 39% smoke a pack or more (16-35 cigs)/day; Drug of preference: 63% marijuana/hashish, 17% heroin/cocaine, 13% alcohol, 7% other.*

Hempel 2002 [USA +] **Uncontrolled before-and-after study (with same sample after intervention)** *A maximum security forensic campus (Vernon Campus) of the North Texas State Hospital* Smokefree building(s) Smokefree "other description": *States "on hospital property"* Smokefree in place: *Implemented 1st Dec 98* Before implementation – single time point: *4 weeks prior to implementation* After implementation – single time point: *4 weeks post implementation*	"As **a mandate from the superintendent of the North Texas State Hospital**, all nicotine products were banned from both of its campuses, effective December 1, 1998." [p.509]	Pharmacotherapies/NRT Other strategies: *Patient education about potential symptoms of withdrawal.* *Any tobacco product found on patients would be considered contraband, seized and appropriate actions taken against the individual.*	Total sample *140 patients* Sample characteristics: *86% male, 14% female* *50% Black, 31% White, 16% Hispanic, 2% Asian.* *Aged 19- 75 years (mean 39 years).* *Almost all suffered from a disorder that resulted in psychosis at some time prior to or during their hospitalization: most common diagnosis was schizophrenia, paranoid type; remaining diagnosed with another form of schizophrenia, schizoaffective disorder, bipolar disorder, delusion disorders or major depression.* *Four groups: (i) non-smoker (n=30), (ii) light (n=30), 1-9 cigs/day, (iii) moderate (n=34), 10-18 cigs/day, (iv) heavy (n=46), ≥19 cigs/day. Smokers consumed mean 14 cigs/day, usually filtered.*
Quinn 2000 [USA -] **Uncontrolled before-and-after study (with same sample after intervention)** *Wichita Falls State Hospital* Smokefree "other description": *"Tobacco could not be used on any part of the hospital campus" (applied to patients, staff and visitors)*	"To provide patients at Wichita Falls State Hospital the opportunity to be free of tobacco use, **the facility implemented** a tobacco-free policy" [p.451]	Written policy(ies) Cessation support *Patient education about smoking and tobacco addiction recovery.* Pharmacotherapies/NRT	Total sample *Nov 98: average daily census n=190; admissions n=68* *Jan 99: average daily census n=188; admissions n=73* Sample characteristics: *Smoking status not reported; aged 18-65 years; both acute and newly admitted psychiatrically ill*

Smokefree in place: *Implemented 1st Dec 98* Before implementation – single time point: *Nov 98* After implementation – single time point: *Jan 99*			*patients; 98% patients admitted on an involuntary basis.*
Shetty 2010 [UK +] **Uncontrolled before-and-after study (with same sample after intervention)** *NHS 60-bed medium secure unit that admits adult men with primary diagnoses of mental illness. In-patients are distributed between 3 wards (assessment, continuing care and rehabilitation) according to levels of risk.* Smokefree building(s) Smokefree grounds Smokefree "other description": *All in-patients in medium secure units were required to abstain from tobacco (unenforceable for small number with unescorted community leave)* Ban exclusions: *If the clinical team agreed there was a clinical reason not to enforce abstinence (in practice, none) or for the small number of patients who had unescorted community leave*. Smokefree in place: *Implemented Mar 07* Before implementation – single time point: *3 months pre-ban* After implementation – multiple time points: *3 months post-ban, 12 months post-ban*	"**The Health Act 2006** introduced legislation that prohibited smoking in all enclosed public areas and workplaces. In-patient mental health units in England and Wales were obliged to ensure that wards and communal areas became smoke-free, and **from 1 July 2008 the legislation covered any enclosed or substantially enclosed part of a mental health unit**. … Nottinghamshire Healthcare National Health Service (NHS) Trust introduced a smoke-free policy in March 2007 prohibiting the use of tobacco products within **the buildings and grounds of all Trust premises**" [p.287]	Posters/signage Cessation support *In-patients groups and individual sessions* Pharmacotherapies/NRT Closure of smoking rooms Staff training Other strategies: *Engagement with patients: individual & group discussions, patient advocates. A physical and procedural security infrastructure already adapted to the prevention of illicit substance use.*	Total sample *n=56* Sample characteristics: *All adult males with primary diagnoses of mental illness.* *89% patients smoked; mean 21 (range 5-50) cigarettes/patient; average daily cigarette consumption in Ward 1 (assessment) n=19 cigs/day, in Ward 2 (continuing care) n=23 cigs/day, in Ward 3 (rehabilitation) n=22 cigs/day*
Cormac 2010 [UK +]	"**The Health Act 2006** required that all	Cessation support	Total sample

Uncontrolled before-and-after study (with different sample after intervention) *Pre- and post-ban responses not linked but most sample the same (n=298 patients for study duration)* *A high secure, long-stay psychiatric hospital for patients with complex mental health disorders who are a grave and immediate danger to the public or themselves (the majority have committed serious offences)* Smokefree building(s) Smokefree grounds Smokefree in place: *Implemented 31 Mar 07* Before implementation – multiple time points: *Dec 06, Mar 07* After implementation – multiple time points: *Apr 07, Jul 07*	indoor and substantially enclosed outdoor workplaces and public places in England and Wales became smoke-free by 1 July 2007. Residential mental health settings were given a temporary exemption for 1 year only." [p.413]	Pharmacotherapies/NRT Staff training Other strategies: *Information provision (no further details)* *Surrender of smoking materials (in-patients)* *On the weekend of policy introduction, all wards were fully staffed and additional activities were provided as a distraction.*	*Patients n=175 (pre-ban) n=115 (post-ban); Staff n=1038 (pre-ban) n=670 (post-ban)* Sample characteristics: *Patients pre-ban (89% male, 70% smokers pre-ban) Patients post-ban (85% male, 87% smokers pre-ban); Staff pre-ban (46% male, 23% smokers pre-ban, 61% nursing staff) Staff post-ban (38% male, 22% smokers pre-ban, 54% nursing staff)*
Haller 1996 [USA +] **Uncontrolled before-and-after study (with different sample after intervention)** *A 16-bed locked inpatient unit in San Francisco, CA, with a 2-week mean length of stay.* Smokefree building(s) Smokefree grounds Smokefree in place: *(Implementation date not reported, early 1990s)* Before implementation – single time point:	"In 1992, the **Joint Commission on Accreditation of Healthcare Organizations** mandated that hospitals must be smoke-free." [p.329]	Pharmacotherapies/NRT *Prescriptions for patients* Other strategies: *Staff education to recognize and treat nicotine withdrawal symptoms/cigarette cravings; written information for patients (use of nicotine gum and how to manage cravings)*	Total sample *Patients: n=27 (pre-ban), n=26 (1 month post-ban), n=30 (2 months post-ban), n=36 (3 months post-ban), n=43 (4 months post-ban) (n=135 total post-ban)* Sample characteristics: *Schizophrenia 19% (pre-ban) 32% (post-ban), Mood disorder 48% (pre-) 28% (post-), Other (pre-) 33% (post-) 40%; 83% of the patients discharged over the 5 months of the study were civilly*

Chart data 1 month pre-ban After implementation – multiple time points: *Chart data 1, 2, 3 and 4 months post-ban*			*committed; Current smoker: Yes 41% (pre-) 53% (post-), No 59% (pre-) 47% (post-); Mean age 44 years (pre-) 42 years (post-); Male 41% (pre-) 57% (post-); White 63% (pre-) 71% (post-), Non-white 37% (pre-) 29% (post-). No statistically significant differences in demographic and clinical features between pre- and post-ban sample.*
Patten 1995 [USA +] **Uncontrolled before-and-after study (with different sample after intervention)** *A 28-bed locked adult inpatient psychiatric unit in Saint Marys Hospital, Rochester, Minnesota* Smokefree building(s) Smokefree grounds Ban exclusions: *Patients with off-unit privileges, at an appropriate level, were granted brief passes to leave the building unaccompanied to smoke ("very few patients")* Smokefree in place: *Implemented 1st Jan 91* Before implementation – single time point: *Records data 3 months pre-implementation* After implementation – single time point: *Rev 6: Records data 3 months post-implementation*	"The **Joint Commission on Accreditation of Healthcare Organizations** accreditation standards … In 1987 Mayo Medical Center initiated a smoke-free policy… the psychiatric units were initially excluded from complete adherence." [p.372]	Implementation committee Cessation support *Patients' weekly support group led by Nicotine Dependence Center* Pharmacotherapies/NRT *Nicotine gum (patients)* Other strategies: *Staff education sessions on the treatment of nicotine dependence; written information for patients*	Total sample *Patients: n=184 (pre-ban), n=178 (post-ban)* Sample characteristics: *Smoker 43.3% (pre-ban) 33.3% (post-ban); Mean years of smoking (smokers only) 16.2 (SD=11.0) (pre-ban) 16.9 (SD=12.6) (post-ban) Range 1-55 years (pre-ban) 1-64 years (post-ban); Cigarettes per day (smokers only) mean 27.1 (SD=17.8) (pre-ban) 28.7 (SD=28.7) (post-ban) Range 5-100 (pre-ban) 5-170 (post-ban); Mean age 39.3 (SD=16.2) years (pre-ban) 39.3 (SD=18.6) years (post-ban) Range 11-82 years (pre-ban) 14-83 years (post-ban); Male 40.8% (pre-ban) 48.3% (post-ban); Diagnosis: Mood disorders 32% (pre-ban) 35% (post-ban); Adjustment disorders 19% (pre-ban) 19% (post-ban); Psychotic disorders not*

			elsewhere classified 11% (pre-ban) 16% (post-ban); Schizophrenia 11% (pre-ban) 6% (post-ban); Psychoactive substance use disorders 7% (pre-ban) 8% (post-ban); (see Evidence Table for list of disorders occurring ≤4%). No statistically significant differences between the pre-ban and post-ban samples.
Studies with Smokefree Indoors Only			
Erwin 1991 [USA -] **Uncontrolled before-and-after study (with same sample after intervention)** *A VA (US Dept. of Veterans Affairs) hospital in an urban centre in Illinois. Two 21-bed acute care psychiatric wards for veterans with diagnose including schizophrenia, depression and post-traumatic stress disorder* Smokefree "other description": *Smokefree acute psychiatric wards (presume from the paper's introduction, the rest of hospital is smokefree)* Smokefree in place: *Implemented 1st Mar 90 (announced 2 months earlier)* Before implementation – single time point: *No date reported* After implementation – multiple time points: *1 week following implementation and 4 weeks following implementation*	"In December 1988, officials of the VA announced the goal of establishing smoke-free acute care sections by mid-1989. Patients excluded from this original proclamation included those hospitalized on psychiatric wards … The **Department of Psychiatry responded to the intentions of VA officials** by following through with the proposal of establishing smoke-free environments for veteran patients" [p.12-3]	Cessation support *Nursing interventions included "Encouraged patients to participate in smoking cessation groups"* Other strategies: *Interventions by nursing staff that address patients with the urge to smoke on the psychiatric ward (e.g. encouraging activities that foster energy replenishment/use; promoting physical benefits of not smoking and preventing harm; individualising care (p.r.n. medications, time outs); involving significant others in care).*	Total sample *n=29 nursing staff* Sample characteristics: *66% (n=19) registered nurses, 17% (n=5) licensed practical nurses, 17% (n=5) nurses aides*
Vorspan 2009 [France +]	"Psychiatric facilities were **included in the**	Pharmacotherapies/NRT	Total sample

Uncontrolled before-and-after study (with same sample after intervention) *Psychiatry department of Fernand Widal hospital, in Paris* Smokefree building(s) Smokefree in place: *Implemented 1st Feb 07* Before implementation – single time point: *1 month pre-ban (Jan 07)* After implementation – single time point: *1 month post-ban (Mar 07)*	**general smoking ban in public places** that occurred in France, in 2007." [p.529]	*For inpatients experiencing withdrawal symptoms (patches 10-40mg/day, inhalators and ad libitum gum); therapies available for staff willing to quit* Closure of smoking rooms *Indoor smoking areas were closed* Other strategies: *Patients evaluated for outdoor smoking breaks, ranging from none, limited and accompanied by a nurse, to unlimited.*	*n=42 staff* Sample characteristics: *76% women; mean age 37 (SD=10) years; location in hospital 62% ground floor, 38% 1st floor; 100% non-smokers, 100% smokerlyser CO measures <5ppm, n=2 lived with smoker.*
Etter 2008 [Switzerland +] **Uncontrolled before-and-after study (with different sample after intervention)** *(The staff sample consisted of largely the same people who answered successive surveys, although results not linked)* *Two in-patient, adult units of the Psychiatry Department of the Geneva University Hospitals: an admission and short-stay unit (16 beds, mean duration of stays=17 days, median=7 days) and a medium-stay unit (16 beds, mean duration of stays=37 days, median=15 days).* Smokefree building(s): *Patients (except those in locked rooms) and staff were allowed to leave the unit to smoke outside* Smokefree in place: *Implemented in Jan 06* Before implementation – multiple time points:	"The **hospital administration** decided that smoking would be banned everywhere inside hospital buildings beginning January 2006. The smoking rooms were then removed. Smoking continued to be allowed outdoors, and patients (except those in locked rooms) and staff were allowed to leave the unit to smoke outdoors." [p.573]	Posters/signage Cessation support Pharmacotherapies/NRT *NRT free for patients, not for staff.* Closure of smoking rooms Staff training	Total sample *2003 (no ban) n=106 (n=49 patients, n=57 staff), 2006 (total ban) n=134 (n=77 patients, n=57 staff)* Sample characteristics: *Patients 2003 (no ban) 91.8% Ever smoked 100+ cigarettes, Daily smokers 73.5%, Occasional (non-daily) smokers 6.1%, Former smokers 12.2%, Never smokers 8.2%; mean age 39.9 years; 59.2% men. Patients 2006 (total ban) 81.6% Ever smoked 100+ cigarettes, Daily smokers 65.8%, Occasional (non-daily) smokers 2.6%, Former smokers 15.8%, Never smokers 15.8%; mean age 41.0 years; 60.0% men.*

Oct 03 (pre ban), Apr 04 (2 months post-partial ban), Dec 05 (20 months post-partial ban/pre-total ban) After implementation – single time point: *Mar-May 06 (3-5 months post-total ban)*			*Staff 2003 (no ban) 64.9% Ever smoked 100+ cigarettes, Daily smokers 26.3%, Occasional (non-daily) smokers 7.0%, Former smokers 22.8%, Never smokers 43.9%; mean age 38.8 years; 35.1% men. Staff 2006 (total ban) 57.9% Ever smoked 100+ cigarettes, Daily smokers 26.3%, Occasional (non-daily) smokers 7.0%, Former smokers 22.8%, Never smokers 43.9%; mean age 40.7 years; 37.5% men.*
Joseph 1993 [USA +] **Cohort study** *The Minnesota Veterans Affairs Medical Centre Drug Dependency Treatment Programme* Smokefree building(s) Smokefree in place: *Implemented in Jun 88* Before implementation – single time point: *1st Jan 88 – 19th May 88* After implementation – single time point: *19th Jul 88 – 31st Dec 88*	"In June 1988, the **Minneapolis Veterans Affairs Medical Center (MVAMC) Drug Dependency Treatment Program (DDTP)** implemented a smoke-free policy on the inpatient unit. Simultaneously, the program began to include treatment for nicotine addiction along with other substances." [p.636]	Other strategies: *Patients informed of policy and cessation programme prior to admission. They were required to agree in writing to nicotine abstinence during treatment and asked to abstain from smoking even when off-site.*	Total sample *All patients n=314, Respondents n=197* Sample characteristics (respondents): *100% male patients; 18-65 years, mean 39.9 years; mean length of stay 22.4 days; 79% smoker on admission; 81% high school graduate; 45% divorced/separated; 61% unemployed on admission; 49% no medical conditions, 12% cardiovascular disease, 7% lung disease, 11% liver disease, 20% psychiatric disease.*
Matthews 2005 [USA -] **Uncontrolled before-and-after study (with different sample after intervention)** *An 18-bed acute crisis stabilization unit where all male patients are first admitted, for up to 3*	"The Joint Commission of Healthcare Organizations (JCAHO) (2005) has mandated that hospitals develop and implement policies to prohibit smoking but allows hospitals to permit patients' smoking only in areas designated separate	Cessation support *Patients - education about nicotine addiction and withdrawal* Pharmacotherapies/NRT *Patients - given nicotine gum (up to 12 mg per day was typically*	Total sample *Patients n=420 admissions (pre-ban) n=428 admissions (post-ban); Nursing staff n=14 (pre-ban) n=13 (post-ban)*

days, by which time patients are either discharged or referred to the male acute treatment unit. The unit is within Dorothea Dix State Psychiatric Hospital, which provides care to people in the south central region of North Carolina. Approx. 3,000 patients (1,800 men, 1,200 women) are admitted to adult psychiatry service per year (approx. 95% involuntarily). Smokefree "other description": *Described as "smoking ban"* Smokefree in place: *Implemented 21st Oct 02* Before implementation – single time point: *Clinical data 3 months pre-ban; other data not reported* After implementation – single time point: *Clinical data 3 months post-ban; other data not reported*	from care, treatment, and service. … **We implemented the ban** because of our frustration with having to schedule assessments and therapeutic activities around patients' smoking breaks. In addition, there were seemingly endless discussions (usually initiated by patients) about how many smoking breaks should be offered, how long they should last, and how many cigarettes they could have." [p.34]	*prescribed) or patches (offered in 7 mg, 14 mg, or 21 mg strengths (depending on the number of cigarettes the patients had reported smoking prior to admission)) to ease withdrawal symptoms.*	Sample characteristics: *Patients: 100% males; a statistically significant difference in diagnostic composition of the patient groups before and after implementation.*
Rees 2008 [USA +] **Uncontrolled before-and-after study (with different sample after intervention)** *The 13-bed First-Step Unit at Louisiana State University Medical centre is a publically funded inpatient substance abuse detoxification unit.* Smokefree "other description": *Ban on tobacco and discontinuation of patient smoke breaks.* Smokefree in place: *Apr 01* Before implementation – single time point: *12 months pre-ban*	"In August of 2000, **Louisiana State University Medical Center, Lafayette (UMC)** prohibited smoking, but made an exception for its inpatient acute medical detoxification facility … observations such as these [tobacco-related mortality rates] were influential in the decision of the First Step Unit to discontinue all patient smoke breaks and ban tobacco". [p.343]	Other strategies: *Patients informed of smoking ban policy as part of their admission screening process*	Total sample *n=516 patients (pre-ban), n=561 patients (post-ban)* Sample characteristics: *Mean age 36.7 years (SEM=0.41) (pre-ban) 35.7 years (SEM=0.41) (post-ban); 69.6% males (pre-) 73.6% males (post-); 72.7% European Americans (pre-) 76.5% European Americans (post-).*

After implementation – single time point: *12 months post-ban*			
Rauter 1997 [USA +] **Cohort study** *New Hampshire Hospital. Public inpatient psychiatric hospital, state of New Hampshire consisting of an acute psychiatric service (APS) with a 145 bed capacity, an adolescent program, and a psychiatric nursing home. APS has approx. 850 admissions annually.* Smokefree building(s) Other: *Designated open-air smoking areas established outside the buildings* Smokefree in place: *All units smokefree 1st Jan 91* Before implementation – multiple time points: *Two pre- implementation baseline measures: Oct 89-Mar 90 (for 6m, starting 15m pre-) and Oct 90-Dec 90 (for 3m pre-)* After implementation – multiple time points: *Two post-implementation measures: Jan 91-Mar 91 (3m post-) and Jan 92-Jun 92 (for 6m, starting 12m post-). (Acuity measures: Jan 91-Jun 91 (6m post-) only).*	"In **response to enlightened state legislative deliberations and concerns for a healthy patient environment** … the hospital administration implemented a strict smoking policy." [p.36]	Cessation support*Sessions from the New Hampshire Lung Association and workshops using hypnosis to quit smoking were offered to employees; 10 % signed up.* *Patients wishing to participate in smoking reduction workshops were urged to do so.*	Total sample *Pre-ban period 1: average daily census n=126; average admissions n=67; pre-ban period 2: average daily census n=129; average admissions n=56; post-ban period 1: average daily census n=129; average admissions n=55.* Sample characteristics: *Patients typically admitted on an involuntary basis with an age range from 18-65 years. A small percentage remains hospitalised for ≥6 months.*
Sterling 1994 [USA -] **Cohort study** *Outpatient cocaine treatment program.* Smokefree building(s)	"Nearly all health care facilities have by now adopted smoke-free environment policies … **reports [of surveys of substance abuse as well as other psychiatric inpatient and outpatient programs instituting smokefree policies] are encouraging** for administrators who have	Posters/signage Closure of smoking rooms *Prior to the ban, smoking was restricted to one large room* Other strategies: *Outpatients informed by therapist*	Total sample *Outpatients: n=204* Sample characteristics: *93.1% African American; 60.3% female; average age at admission 31.6 years (SD=6.4).*

Smokefree in place: *Implemented Sep YYYY (year not stated, early 1990s?)* Before implementation – multiple time points: *3 months pre-ban (Jun-Aug) breakdown; sub-sample 1 month pre-ban (Aug)* After implementation – multiple time points: *3 months post-ban (Sep-Nov) breakdown; sub-sample 1 month post-ban (Sep)*	considered smoke-free policies, these results are based primarily on attitudes and perceptions, and not on actual patient behaviour … we decided to conduct an empirical evaluation." [p.162]		
Velasco 1996 [USA -] **Cohort study** *25 bed, locked inpatient psychiatric service in the university of Louisville Hospital which serves primarily an inner city population.* Smokefree "other description": *Prohibited cigarette smoking of inpatients.* Smokefree in place: *Implemented 1st Oct 91* Before implementation – single time point: *6 weeks immediately prior (14th Aug-30th Sep 91)* After implementation – multiple time points: *6 weeks immediately after (1st Oct-12th Nov 91) and 6 weeks two years later (1st Oct-3rd Nov 93)*	"The **Joint Commission on Accreditation of Healthcare Organizations** (JCAHO) declared that all accredited hospitals be smoke-free as of January 1992." [p.200]	Posters/signage Pharmacotherapies/NRT Other strategies: *Patient notification prior to admission.*	Total sample *1991 (immediately prior and immediately post-ban combined): n=193 patients; 1993: n=96 patients* Sample characteristics: 1*991 (immediately prior and immediately post-ban combined): 52% female; 70% Caucasian, 28% African American, 2% other; About 40% of the patients have psychoses, 40% have an affective disorder, and 20% have a chemical dependence or personality or organic mental disorders". 1993: 53% women; 63% Caucasian, 36% African American, 1% other. Average length of stay approximately 9 days in 1991 and in 1993; and daily patient census and patient diagnosis similar in both years.*

Table 2.2: Characteristics of smoke-free in studies in acute and/or maternity (or non-mental health) settings

○ **Title** ○ **Study design** ○ **Acute and/or Maternity Setting** ○ **Type of ban** ○ **Implementation stage (the most recent stage addressed in the study)** ○ **When assessed**	**Legislation, policy or other impetus** *(As reported in the paper. If national legislation or a national or local policy is not cited in the article, other statements from the study are provided. All papers typically report the health risks to smokers and those around them in their introduction or literature review.)*	**Supporting strategies/ interventions**	**Sample size & characteristics**
Studies with Smokefree Grounds			
Nagle 1996 [Australia +] **Controlled before-and-after study (with different sample after intervention)** **Hospital 1 (H1 intervention):** A large urban teaching hospital of 530 beds. **Hospital 2 (H2 control):** A smaller rural hospital of 156 beds with similar case mix to H1. Smokefree building(s) Smokefree grounds *Partial - both H1 and H2 retained "smoking areas" within the grounds* Smokefree in place: *Indoor since 1988; partial outdoor in 1991 in H1, already in place in H2.* Before implementation – single time point: *2 weeks pre-implementation at H1 (both H1 and H2) in 1991* After implementation – single time point: *1 month post-implementation at H1 (both H1 and H2) in 1991*	"In Australia, **legislation was introduced in 1988, in New South Wales (NSW)**, which required a total prohibition of smoking by all staff, patients, and visors, in all hospital buildings and vehicles. … Recently a few hospitals … have undertaken initiatives aimed at the gradual implementation of totally smoke-free hospital sites (that is restrictions that include parts or all of the grounds outside the buildings." [p.199-200]	Implementation committee *H1: Formed by occupational health and safety team with reps from NSW Cancer Council, National Heart Foundation, hospital management, unions, and study's lead author* Posters/signage *H1: all signs displayed either the words "No Smoking" or the symbol and all were attached to the outer walls of the building in 22 sites (16%); H2: signs displayed the words "You are now entering a smoke-free environment, please extinguish your cigarette" and were positioned at the entrance of the site accompanied by an ashtray in 11 sites (16%).* Staff letters/payslip notes *H1: Newsletters notified staff* Other strategies: *H1: Policy launch incorporated into World No Tobacco Day Activities. Staff notified by bulletin boards and their supervisors.*	Control/Comparison sample *Hospital 2: T1 n=2414 observations; T2 n=1943 observations. 67 sites mapped and observed at different time points over 7 days: 3 courtyards, 5 main entrances, 22 secondary entrances, 2 covered exit passageways, 16 verandas, 1 internal and 3 external firestairs, 7 pathways >10m and <50m from any entrance, and 8 lawns/car parks >10m and <50m from entrances.* Intervention sample *Hospital 1: T1 n=4252 observations; T2 n=2787 observations. 135 sites mapped and observed at different time points over 7 days: 8 courtyards, 5 main entrances, 8 secondary entrances, 9 covered exit passageways, 88 verandas, 5 internal and 3 external firestairs, 9 pathways >10m and <50m from any entrance, and 4 lawns/car parks >10m and <50m from entrances*
Wheeler 2007 [USA -] **Uncontrolled before-and-after study (with different**	"Despite these concerns [such policies would lead employees and patients to migrate to	Written policy(ies) Implementation committee	Total sample *Questionnaire site 1 (staff): n=842*

sample after intervention) Two sites: Site 1: Arkansas's university hospital and academic medical center; and Site 2: a smaller, private children's hospital that uses the university's faculty and residents for its medical staff. Smokefree building(s) Smokefree vehicles Smokefree grounds Smokefree "other description": *All property owned or leased.* Smokefree in place: *Site 1: announced 29th Oct 03, implemented 4th Jul 04; Site 2: announced Spring 04, implemented 6 months later (employees) and Spring 05 (12 months later) (employees, visitors, patients)* Before implementation – single time point: *Site 1: Apr 04 (questionnaire), Jul 03-Jun 04 monthly mean (hospital utilisation), Jan 04 (employee resignations, terminations, hires); Site 2: 2 months after employee only ban (= 4 months pre-full smokefree) (questionnaire), May 04-Oct 04 monthly mean (hospital utilisation)* After implementation – single time point: *Site 1: May 05 (questionnaire), Aug 04-Jul 05 monthly mean (hospital utilisation), Jan 05 (employee resignations, terminations, hires); Site 2: May 05-Oct 05 monthly mean (hospital utilisation)*	other institutions, create difficult enforcement roles for hospitals, and cause hospitals to be viewed as uncaring and judgmental toward patients and families], **the leadership of Arkansas's only university hospital and academic medical center decided to adopt a smoke-free campus policy at the urging of the university's chancellor**. Soon thereafter, a similar policy was adopted by a smaller, private children's hospital that uses the university's faculty and residents for its medical staff." [p.745]	Posters/signage Staff meetings Staff letters/payslip notes Patient appointment letters Cessation support Pharmacotherapies/NRT *Site 1: free to employees for 6m (Apr-Sep 04), on sale on campus to non-employees. Site 2: free to employees (open-ended), n sale on campus to non-employees.* Other strategies: *Staff appointed (site 1: wellness director, site 2: tobacco control specialist with cessation expertise); Site 1: portable pagers in emergency dept. for patrons/visitors who needed to leave campus to smoke; Scripts for staff to deal with patrons smoking; Staff violations dealt with by HR dept.; Written policy in new employees packs; Neighbouring businesses notified; Announcements in local media.*	*(pre-implementation), n=912 (post-implementation)* Sample characteristics: *occupation distribution changed significantly due to a change in nurse respondents from 19% (pre-) to 11% (post-) (p<0.0001) and education distribution changed significantly due to decreases in 'high school or less' and 'college graduate' and an increases in 'professional or post-college education' (p=0.015). Gender (p=0.8964), age and race distributions did not change significantly between measures*
Kvern 2006 [Canada -] **Uncontrolled before-and-after study (with different sample after intervention)** A number of Winnipeg Regional Health Authority operations including Deer Lodge Centre (a long-term care facility), Health Sciences Centre (a tertiary care facility), community sites, Saint Boniface General Hospital and other long-term care facilities.	"In April 2003, the WRHA [Winnipeg Regional Health Authority] Smoke-free Policy Working Group (SFPWG) provided a smoke-free policy background paper to the WRHA Board for their information and consideration, and to request permission to develop a smoke-free policy. **Once the SFPWG received this permission, they developed WRHA's Smoke-free Policy (10.000.010), which was approved by the**	Written policy(ies) *Smokefree Policy; a Comprehensive Communications plan* Implementation committee *Smokefree Policy Working Group* Posters/signage *Signage; no-smoking symbols painted on pavements + driveways* Staff meetings	Total sample *Data reported from a range of hospitals and care facilities.*

Smokefree building(s) Smokefree doorways/entrances Smokefree grounds *Smokefree grounds policy excludes mental health services and home-based services* Smokefree in place: *Smokefree grounds implemented 5th Jul 04* Before implementation – single time point: *Policy compliance observation (31 May – 09 Jun '04)* After implementation – single time point: *Policy compliance observation (26 Jul – 9 Aug '04); Support for inpatients (NRT use) (Jul-Sep '04)* After implementation – multiple time points: *Policy compliance security contacts (Jul '04, Aug '04, Sep '04)*	**Board in June 2003**. The Board then tasked the SFPWG with developing a policy implementation plan for the smoke-free grounds aspect of this policy and to make recommendations on its operational implications; this was done over the ensuing year. After much planning, the smoke-free grounds aspect of the Smoke-free Policy began a phased-in implementation on July 5, 2004." [p.1]	Staff letters/payslip notes *Posted notices, pay stub inserts, facility newsletters* Cessation support *Staff: Information resources, on-site cessation groups* Pharmacotherapies/NRT *Staff: reimbursement for smoking cessation medication* *In-patients: prescribing aids to assist appropriate NRT* Temporary abstinence support *In-patients* Moved ashtrays/shelters *To the site periphery* Staff training *Admissions training for new staff (inform policy, identify NRT needs); Security staff trained to address non-compliance with a 'graded approach' – used info sheet as an aid, ask to extinguish cigarette or move off-site.* Other strategies: *Media (paid and earned) to inform public and patient groups; health organisations' websites; bilingual information sheet for inpatients and general public*	
Hudzinski 1990 [USA +] **Uncontrolled before-and-after study (with same sample after intervention)** A health care institution (clinic and medical foundation) with inpatient units employing staff physicians and psychologists Smokefree building(s) Smokefree "other description": *A "comprehensive campus-wide smokefree environment"*	"The Ochsner Medical Institutions (New Orleans, LA) have been a prime health care provider **advocating this health risk ever since one of our founders, Alton Ochsner, first reported the association of smoking and lung cancer in 1939**. More recently, we have established one of the first health care institution policies that enforced a comprehensive campus-wide smokefree environment." [p.1198]	Implementation committee *Smoke-Free Task Force (included clinicians, psychologists, and administrative personnel from public affairs and employee relations departments)*	Total sample *Staff: n=1946 (pre-ban), n=1608 (6m post-ban), n=684 (12m post-ban)* Sample characteristics: *At 12 months follow-up: 18% physicians, 82% other employees; 4% <35years, 29% 35-44 years, 27% ≥45 years; 29% male*

Ban exclusions: *Patient smoking permitted on the acute psychiatry inpatient unit by physician approval*. Smokefree in place: *Implemented 1986* Before implementation – single time point: *6 months pre-ban* After implementation – multiple time points: *6 months post-ban and 12 months post-ban*			
Gadomski 2010 [USA +] **Uncontrolled before-and-after study (with different patient sample), (with same staff sample)** A 180-bed, acute care inpatient teaching facility in a small town in upstate New York Smokefree building(s) Smokefree doorways/entrances Smokefree grounds *No description of how comprehensive grounds ban is.* Smokefree in place: *Implemented 1st Jul 06* Before implementation – single time point: *Staff: Mar-Jun 05* Before implementation – multiple time points: *Patients: each month Jan 05-Jun 06* After implementation – single time point: *Staff: Mar-Jun 06* After implementation – multiple time points: *Patients: each month Jul 06-Sep 08*	"Prior to the implementation of the smoke-free medical campus policy, it was common to see employees, visitors, and patients lined up outdoors around the main hospital entrances and smoking just beyond the ''no smoking'' signage. Inpatients could look out their windows at the main entrance or into the courtyard and see hospital staff, other patients, and visitors smoking." [p.51]	Cessation support Pharmacotherapies/NRT Other strategies: *Campus map detailing new smoke-free borders.* *Staff, community and patient education*	Total sample *Average of n=959 patients per month pre-ban, n=988 per month post-ban.* *Cohort of n=489 staff reporting in both 05 and 07. n=624 staff with anniversary date Mar-Jun 05; n=661 staff with anniversary date Mar-Jun 06; n=1112 staff with anniversary date Mar-Jun 07 (07 sample includes new hires and management staff).* Sample characteristics*: not reported*
Ripley-Moffitt 2010 [USA +] **Interrupted time series** University-affiliated hospital system in North Carolina	"With all U.S. hospitals having eliminated indoor smoking, an **increasing number have shown interest in adopting 100% tobacco-free hospital campus (TFHC) policies**" [p.e25]	Posters/signage Staff meetings Staff letters/payslip notes *Employee newsletters* Cessation support *Employees offered free smoking*	Total sample *n=2024 employees (37%) pre-smokefree; n=210 (68% smokers from baseline) enrolled in follow-up* Sample characteristics (of smoking

Smokefree buildings Smokefree grounds *"100% tobacco-free hospital campus"* Smokefree in place*: Implemented 4th Jul 07* Before implementation – single time point: *1 month prior to smokefree* After implementation – multiple time points: *6 months and 1 year after smokefree*		*cessation services through occupational health*	cohort): *average age 42 years (SD=10); 82% female 73% White (higher percentages than in the full-time employee population as a whole). 90% post-high school education; 97% private insurance (most with the state employee health plan)*
Studies with Smokefree Indoors Only			
Fernández 2008 [Spain +] **Uncontrolled before-and-after study (air vapour-phase nicotine samples)** 44 of 61 public hospitals (directly managed by or serving the national health service), all who have joined the Catalan Network for Smoke-Free hospitals and implemented the Smokefree Hospital Project. Smokefree building(s) Smokefree in place: *1st Jan 06* Before implementation – single time point: *Sep-Dec 05* After implementation – single time point: *Sep-Dec 06*	"On January 1st 2006, **Spain … enacted a comprehensive regulation to prevent and control smoking**. Smoking is banned in all indoor public workplaces, public transport, hospitality venues (with some exceptions), schools and universities, retail stores and shopping centers, as well as hospitals and other health care facilities. … smoking is now totally banned in any location within hospitals and health care buildings, eliminating smoking rooms, smokers' cafeterias and smokers' areas within cafeterias" [p.624]	Cessation support *to professionals, patients and visitors* Staff training *tobacco control training* Other strategies: *Guaranteeing common follow up and evaluation*	Total sample *n=44 public hospitals* Sample characteristics: *22 county hospitals of basic health care level, 10 reference hospitals and 12 university hospitals. Median number of beds=250, with 18 hospitals >300 beds. Median number of employees=612, with one third hospitals >800 workers.*
Donchin 2004 [Israel +] **Uncontrolled before-and-after study (with different sample after intervention)** A 959-bed university hospital in Jerusalem, employing over 3,700 salaried workers and accommodating 42,580 inpatients and 201,185 outpatient visits (2001). Smokefree building(s) Smokefree in place: *Implemented 1 Nov '00*	"Based on the U.S. experience, and in accordance with these laws, **the general director of Hadassah Hospital implemented a complete ''smoke-free'' policy in the hospital** as of November 2000. … In August 2001 (15 months later), antismoking law was revised in Israel. The revised law called for, among other things, a complete ban of smoking in all hospitals." [p.589-90]	Implementation committee Cessation support *Employees* Other strategies: *Smoking shelters ("booths") erected outside the hospital building; sale of tobacco products banned on site; Information campaign (2 months pre-policy) and press conference launch; Fines for violations authorised*	Total sample *n=368 staff (pre-policy), n=364 (post-policy)* Sample characteristics (pre- and post-policy): *Doctors and dentists 17.1% (pre-) 13.5% (post-), nurses 27.4% 31.9%, administrators and clerks 14.9% 17.0%,technicians 28.0% 26.6%, unskilled workers 12.5% 11.0%; <35 years 23.1% (pre-) 22.5% (post-), 35–*

Before implementation – single time point: *3 months pre-policy* After implementation – single time point: *6-9 months post-policy*			*44 years 26.9% 28.3%, 45– 54 years 29.3% 27.7%, 55+ years 20.7% 21.4%; Males 36.1% (pre-) 30.2% (post-); 0-12 years of education 23.2% (pre-) 25.4% (post-), 13-15 years of education 23.5% 18.5%, 16+ years of education 53.3% 56.1%. Smoking status: current smokers 19% (pre-) 19.5% (post-), past smokers 12.5% 19.5%.*
Stillman 1990 [USA +] **Cohort study *Prospective descriptive study*** The Johns Hopkins Hospital. Maryland, USA. A large urban medical centre encompassing 24 buildings in a 12-square-block area. (Same location as Stillman 1995 study) Smokefree building(s) Smokefree in place: *Announced 1st Jan 88, implemented 1st Jul 88.* Before implementation – single time point: *Survey Nov 87 (2 months pre-announcement); Ashtray butt counts monthly for 6 months pre-ban; Smoking observations monthly for 8 months pre-ban* Before implementation – multiple time points: *Nicotine vapour monitoring 8 months and 1 month pre-ban* After implementation – single time point: *Survey Nov-Dec 88 (1 year follow-up, 6 months post-ban); Nicotine vapour monitoring 8 months post-ban; Ashtray butt counts monthly for 6 months post-ban; Smoking observations monthly for 8 months post-ban*	"In 1987, **the Board of Trustees of The Johns Hopkins Hospital voted to eliminate smoking as of July 1, 1988, in all areas of the hospital complex** … the previous policy allowed smoking in the designated areas … except in The Children's Center. Smoking also persisted among visitors, patients, and staff in non-designated areas through the institution." [p.1565]	Written policy(ies) Implementation committee *Steering committee of representatives of all major departments was formed to implement the smokefree environment* Cessation support *Free to all employees: multi component 8-week smoking cessation groups, 1-hour quitting clinics, individualised counselling, and self-help manuals* Staff training *Targeted at all hospital managers, supervisors and security personnel to ensure proper policy enforcement* Other strategies: *Internal media and educational campaign; Free employee screening for cholesterol, blood pressure, CO, cardiovascular risk assessment counselling 6 months before implementation and continued to the present.*	Total sample *n=5190 staff pre-implementation (59%); of those still employed post-implementation, n=2877 (64%).* *n=1260 minutes of observations of employee and visitor smoking in the cafeterias and n=1440 minutes in the lounges*
Martínez 2008 [Spain +] **Interrupted time series *4 surveys between 2001-2006***	"After the ratification of the Framework Convention on Tobacco Control on January 27, 2005, **a new law for Prevention and Control of**	Closure of smoking rooms Staff training *For nurses: tobacco control educational*	Total sample *Staff: n=188 in 2001, n=186 in 2002, n=206 in 2004, n=237 in 2006*

The Catalan Institute of Oncology, a Comprehensive Cancer Centre in Barcelona Smokefree "other description": *The Hospital became "entirely smoke-free" in 2005* Smokefree in place *A smoke free policy was introduced progressively from '97: in '03, smoking was only allowed in 1 smoking area, exclusively for employees. In Jul '05, the Hospital became entirely smoke-free.* After implementation – multiple time points *2001, 2002 and 2004 (all pre-full ban implementation) 2006 (post-full ban implementation)*	**Smoking has been implanted in Spain**. Restrictions in selling, advertising, and using tobacco in public places, workplaces and hospitals have been established …The Catalan Institute of Oncology (ICO), a Comprehensive Cancer Center in Barcelona, Spain, began the implementation of the ‘‘smoke-free’’ policy in 1997. Before the official launching, ICO gradually developed a smoke-free policy plan whose main element was to facilitate an organizational change.” [p.89]	*and training courses*	Sample characteristics: *Occupation 2001 20% doctors 34% nurses 56% administrative employees 35.3% other; 2002 24.3% doctors 32.3% nurses 46.7% administrative employees 30.7% other; 2004 17.2% doctors 30% nurses 31.3% administrative employees 47.8% other; 2006 15.2% doctors 32.6% nurses 37% administrative employees 35.7% other.* *Smoking status: 2001 34.5% smokers 38.3% never smokers 27.1% former smokers; 2002 32.8% smokers 44.6% never smokers 22.6% former smokers; 2004 34% smokers 37.9% never smokers 28.2% former smokers; 2006 30.6% smokers 39.4% never smokers 30.1% former smokers.*
Daughton 1992 [USA -] **Uncontrolled before-and-after study (with same sample after intervention)** *(Post-sample is a sub-sample of the pre-sample*) "In a hospital setting" Smokefree building(s) *A “total indoor smoking ban”* Smokefree in place *No implementation date reported* After implementation – multiple time points *Post-ban Survey 1 (1 year after policy announced, 5 months after implementation); Post-ban Survey 2 (2 years after policy announced, 17 months after implementation)*	Not reported	Implementation committee *32-member Smoke-Free Campus Task Force* Staff letters/payslip notes *Employee bulletins and newsletters* Cessation support *Hospital-promoted cessation programs, and offer to subsidise costs of locally available cessation programs.* Other strategies: *In-house media campaign*	Total sample *Staff Survey 1: n=1070* Sample characteristics: *n=589 non-smokers, n=284 ex-smokers (self-report abstinent for >5 months prior to ban announcement), n=16 ban-year quitters (self-report abstinent for ≥3 months), n=181 smokers (n=55 light smokers <10 cigs/day, n=110 moderate smokers 10-29 cigs/day, n=22 heavy smokers ≥30 cigs/day). Occupations (of those who identified themselves) included: physicians, nurses, cafeteria workers, painters, mailroom clerks, laboratory technicians, administrators, secretaries, researchers and environmental service workers.*

			Staff survey 2: n=88

3. Review Findings

Twenty-seven studies, published in English since 1990, were included in Review 6 to answer the review questions on the effectiveness of smokefree strategies and interventions in secondary care settings and any other consequences from their adoption in mental healthcare or acute and maternity healthcare settings. This section is structured by the three research questions:

- Q1: How effective are strategies and interventions for ensuring compliance with smokefree legislation and local smokefree policies in secondary care settings? (And how does the effectiveness vary for different population groups, by health status or by specialty care services?)
- Q2: Are there any unintended consequences from adopting smokefree approaches in acute and maternity care settings?
- Q3: Are there any unintended consequences from adopting smokefree approaches in mental healthcare settings?

Each of the three sections begins with a summary table outlining the outcomes measured by each study used to answer the question, followed by a figure containing descriptive summaries of the main features of the studies. Findings from the studies are then organised by outcome measure for acute and maternity services then mental health services in secondary care settings, and the evidence statements and their applicability to the UK setting are presented throughout. The full evidence tables for each study are appended (Appendix 7) and the tables summarising the type and extent of each study's smokefree policy and supporting strategies can also be referred to in the previous section (Table 2.1 for mental health setting studies and Table 2.2 for acute and maternity setting studies).

3.1 Q1: How Effective are Strategies and Interventions for Ensuring Compliance with Smokefree Legislation and Local Smokefree Policies in Secondary Care Settings?

Subsidiary question: how does the effectiveness vary for different population groups, health status or specialty care services?

Thirteen studies were identified and included in the review which addressed this question, seven conducted in acute and maternity settings and six in mental healthcare settings. The outcomes measures of effectiveness for each study are presented in Table 3.1 and the studies are summarised in full detail in the evidence tables in Appendix 7. The findings from the studies are presented (studies are annotated with the country and internal validity score in parentheses following the citation).

Table 3.1: Outcome measures of compliance with smokefree by setting, type of ban & study

Title Study design	Type of ban	Outcomes measured: compliance with smokefree
Acute And Maternity Settings		
Smokefree Grounds		
Nagle 1996 [Australia +] **Before-and-after study (with different sample after intervention)**	Smokefree building(s) Smokefree grounds *Partial - both H1 and H2 retained "smoking areas" within the grounds*	**Outcomes: compliance with smokefree** Number of smokers (anyone who was either lighting, stubbing out, or smoking a cigarette, pipe or cigar) and non-smokers observed in pre-defined outdoor sites (researcher observation). **Outcomes: effectiveness of strategy to ensure compliance** Number of smokers (anyone who was either lighting, stubbing out, or smoking a cigarette, pipe or cigar) and non-smokers observed in pre-defined outdoor sites (researcher observation).
Wheeler 2007 [USA -] **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree building(s) Smokefree vehicles Smokefree grounds Smokefree "other description": *All property owned or leased.*	Proportion of employees exposed to ETS (self-report to walking through cigarette smoke on campus).
Kvern 2006 [Canada -] **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree building(s) Smokefree doorways/entrances Smokefree grounds	Number of individuals smoking on the property (1 individual, made all observations at both time points). Number of contacts security personnel had with staff smokers smoking on facility grounds (data records). Number of contacts security personnel had with contractor smokers smoking on facility grounds (data records). Number of contacts security personnel had with visitor smokers smoking on facility grounds (data records). Number of contacts security personnel had with in-patient smokers smoking on facility grounds (data records). Measured but no pre- comparator; outcome excluded from review: *number of complaints received about policy (data records).*
Smokefree Indoors Only		
Fernández 2008 [Spain +] **Before-and-after study (air vapour-phase nicotine samples)**	Smokefree building(s)	Overall change in median airborne nicotine concentrations across the hospitals (sampled using a plastic cassette, with a windscreen on one side, containing a 37mm diameter filter treated with sodium bisulphate.) Change in median airborne nicotine concentrations by locations (7 public and staff locations: cafeterias, surgical area staff dressing rooms, general surgery unit corridors, general medicine hospitalization unit

		corridors, top floor fire escapes, emergency department waiting rooms, and main entrance halls) across the hospitals (sampled using a plastic cassette, with a windscreen on one side, containing a 37mm diameter filter treated with sodium bisulphate.)
Donchin 2004 [Israel +] **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree building(s)	Rate of observed smoking in unauthorized areas by staff (How often do you see people [employees, patients or visitors] smoking at work in places where smoking is banned?' Frequently, occasionally, never.) Proportion of staff reporting they usually leave their workstation to smoke (Do you usually leave your work station to smoke? Always, sometimes, never).
Stillman 1990 [USA +] **Cohort study** ***Prospective descriptive study***	Smokefree building(s)	Proportion of staff observed actively smoking (in hospital cafeterias, in lounges) Proportion of visitors observed actively smoking (in hospital cafeterias, in lounges) Median levels of vapour-phase nicotine concentration (a proxy for ETS) levels in 7 indoor locations around the hospital (using passive diffusion nicotine monitors) Number of cigarette remnants (in ashtrays, morning and afternoon, at Elevator lobbies, Waiting lounges, Hospital entrances at the parking garages) Number of negligent smoking fires (hospital incident reports)
Martínez 2008 [Spain +] **Interrupted time series** ***4 surveys between 2001-2006***	Smokefree "other description": *The Hospital became "entirely smoke-free" in 2005*	Proportion of employees reporting to have smoked in selected hospital areas (self-reported measure). Proportion of employees reporting to work in a smokefree environment (Asked to estimate the number of hours they are exposed to ETS during their shift: zero hours (smokefree), <1 hour, 1-4 hours, >4 hours).
Title **Study design**	**Type of ban**	**Outcomes: compliance with smokefree**
Mental Health Settings		
Smokefree Grounds and/or Buildings		
Patten 1995 [USA +] **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree building(s) Smokefree grounds Ban exclusions: *Patients with off-unit privileges, at an appropriate level, were granted brief passes to leave the building unaccompanied to smoke ("very few patients")*	Frequency of incidents of patients smoking in the hospital room (data from patient charts)

Shetty 2010 **[UK +]** **Uncontrolled before-and-after study (with same sample after intervention)**	Smokefree building(s) Smokefree grounds Smokefree "other description": *All in-patients in medium secure units were required to abstain from tobacco (unenforceable for small number with unescorted community leave)* Ban exclusions: *If the clinical team agreed there was a clinical reason not to enforce abstinence (in practice, none) or for the small number of patients who had unescorted community leave*.	Measured but no pre- comparator; outcome excluded from review: *frequency of illicit use or possession of tobacco (from chart data and hospital records)*
Smokefree Buildings		
Erwin 1991 **[USA -]** **Interrupted time series**	Smokefree "other description": *Smokefree acute psychiatric wards (presume from the paper's introduction, the rest of hospital is smokefree)*	**Outcomes: effectiveness of strategy to ensure compliance** Staff's rating of their own overall individual effectiveness (use of strategies, regardless of the number and type) to help patients comply with smokefree on the wards by addressing their urge to smoke (self-report measure). Data for 'mildly effective', 'moderately effective' ratings reported. Data for 'not effective' or 'very effective' not reported, no p values calculated **Outcomes: compliance with smokefree** Frequency of nursing staff reporting they requested patients to terminate smoking a lit cigarette (self-report measure). Frequency of nursing staff reporting they requested family to desist 'smuggling' cigarettes to patients (self-report measure).
Vorspan 2009 **[France +]** **Uncontrolled before-and-after study (with same sample after intervention)**	Smokefree building(s)	Non-smoking staff exposure to ETS measured by salivary cotinine levels (quantified by high performance liquid chromatography). Employees were defined as ''exposed'' before the ban if cotinine level >25ng/ml. Subjective measures of exposure to ETS before and after smokefree both taken after implementation; excluded from review.
Etter 2008 **[Switzerland +]**	Smokefree building(s) *Patients (except those in*	Perceived exposure to ETS among non-smokers patients in unit (bedrooms, dining rooms, corridors) –

Uncontrolled before-and-after study (with different sample after intervention) *(The staff sample consisted of largely the same people who answered successive surveys, although results not linked)*	*locked rooms) and staff were allowed to leave the unit to smoke outside*	never, sometimes, often (self-report measure). Perceived exposure to ETS among non-smokers staff in unit (bedrooms, dining rooms, corridors) – never, sometimes, often (self-report measure). Annoyance from ETS among non-smokers patients in unit (bedrooms, dining rooms, corridors) – absolutely not, somewhat, a lot (self-report measure). Annoyance from ETS among non-smokers staff in unit (bedrooms, dining rooms, corridors) (self-report measure).
Matthews 2005 [USA -] **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree "other description": *Described as "smoking ban"*	Staff anticipating/reporting an increase in patients' smoking-related contraband (self report measure) Instances of smuggling smoking-related contraband (Patient records data)
Rauter 1997 [USA +] **Cohort study**	Smokefree building(s) Other: *Designated open-air smoking areas established outside the buildings*	Frequency of possession of unauthorised cigarettes or matches incidents (hospital incident reports)

3.1.1 Effectiveness of Supporting Strategies and Interventions for Ensuring Compliance: Acute and Maternity Settings

One study was identified which specifically looked at the effectiveness of supporting strategies for ensuring compliance with a smokefree policy or national legislation in an acute and maternity setting. It showed a decrease in indicators of compliance with a local-level smokefree policy.

3.1.1.1 Effectiveness of the Introduction of 'No Smoking Outdoors' Signs

One before and after study reported outcomes relating to the effectiveness of the introduction of 'no smoking outdoors' signs for ensuring compliance with a local (hospital board's) outdoor partial smokefree policy (see Table 2.2 above). It showed a decrease in indicators of compliance with a local (hospital board's) outdoor partial smokefree policy, at a hospital that had already implemented New South Wales state legislation for indoor (hospital buildings and vehicles) smokefree.

[9]**Nagle's 1996 [Australia +] controlled before and after study (with different sample after)** described the type and location of smokers on the grounds of hospitals with local smokefree policies, and the impact of introducing smokefree signs in outdoor areas of the grounds. Assessments were conducted at the intervention hospital (H1) at a single time point before and after

[9] A discrepancy is noted in Table 3 of Nagle et al., 1996 (p.202) between the raw data and percentages given: the "n/total n" figures do not correspond to the (%) figures for Hospital 1 at Time 1 (32% and 68%, also quoted in the text on p.202 and the abstract). From our calculations, the Chi-square test results do correspond to the "n/total n" figures as printed and we believe the percentages may be incorrect (by our calculations, 18% and 82% for Hospital 1 at Time 1). As the two percentages are the only discrepant figures in the data in Table 3, we have made the assumption that the frequencies data is correct and used it in our review.

the policy was implemented, and at a control hospital (H2) at the same two time periods. Supporting strategies included an implementation committee, posters, a policy launch incorporated into the World No Tobacco Day activities, staff newsletters, bulletin boards and information by supervisors. In the intervention hospital 2 weeks before the implementation of smokefree areas in the grounds, **Nagle 1996 [Australia +]** reports that 18% of all outdoor smokers (105/593) used the outdoors sites selected to become smokefree. There was a significant increase to 28% of all outdoor smokers (83/301) observed in those sites 1 month following the implementation of smokefree outdoor areas signage ($p<0.001$). In the control hospital, there was no significant change in the proportion of all outdoor smokers who smoked in outdoor sites with smokefree signage at 2 weeks before implementation (48%, 62/130) and at 1 month following implementation (46%, 68/148) ($p=0.771$).

The study provides limited details about which outdoor sites at the control hospital (H2) were smokefree and which were smoking areas, but the authors note that in the main entrance site "*clear geographical boundaries existed and the smokefree signs were positioned at all entries to the area with the wording 'You are now entering a smoke-free environment, please extinguish your cigarette'*". Only 7% of all outdoor smokers were observed in the main entrance location in violation of the signs at 1 week pre- and 1 month post-intervention. Sites within 10m of entrances and exits of the control and intervention hospitals were more popular with outdoor smokers at both time points (82% (1 week pre-), 82% (1 month post-) and 90% (1 week pre-), 93% (1 month post-) respectively) than sites more than 10m and less than 50m from entrances in exits of the control and intervention hospitals. These two zones are not further sub-divided in the report, however, into those with smokefree sites and those with smoking areas.

Effectiveness of Supporting Strategies and Interventions for Ensuring Compliance: Acute and Maternity Settings

Evidence statement 1.1: There is **weak** evidence from one before and after study in Australia (**Nagle 1996 [+]**) in an **acute and maternity setting** that 'no smoking outdoors' signage decreases compliance with state indoor (hospital buildings and vehicles) smokefree legislation in New South Wales and a local (hospital board's) outdoor partial smokefree policy. Comparing use of the outdoor sites selected to become smokefree 2 weeks before implementation of the smokefree outdoor signage, with usage 1 month after its implementation, there was a significant increase in the proportion of outdoor smokers who smoked in those areas at the intervention hospital ($p<0.001$, Chi-square=11.71, df=1). ***Other supporting strategies*** *were: an implementation committee (formed by occupational health and safety team with reps from NSW Cancer Council, National Heart Foundation, hospital management, unions, and study's lead author), the policy launch incorporated into the World No Tobacco Day activities, staff newsletters, bulletin boards and information by supervisors*.

UK Applicability: This evidence was conducted outside the UK, however the policy covers outdoor smokefree (a local policy similar to the UK context) and there is no reason to believe the strategy's effect is not applicable to the UK setting.

3.1.1.2 How does the effectiveness vary for different population groups, by health status or by specialty care services?

There were no sub-group analyses for different population groups, by health status or by specialty care services in the only study (**Nagle 1996 [Australia +]**) which specifically looked at the

effectiveness of supporting strategies for ensuring compliance with a local outdoor partial smokefree policy in an acute and maternity setting.

3.1.2 Effectiveness of Supporting Strategies and Interventions for Ensuring Compliance: Mental Healthcare Settings

One study was identified which specifically looked at the effectiveness of supporting strategies for ensuring compliance with a smokefree policy or national legislation in a mental healthcare setting. It showed an increase in indicators of compliance with a local-level smokefree policy.

3.1.2.1 Effectiveness of Staff Aiding Patients' Compliance

One before and after study in a mental healthcare setting reported outcomes relating to the effectiveness of staff aiding inpatients' compliance with a local smokefree buildings policy by the US Department of Veteran's affairs.

Erwin 1991 [USA -] interrupted time series
This study presents the reactions of 29 nursing staff members on two inpatient psychiatric wards at a Veterans Affairs hospital who experienced the transition to smokefree status after the introduction of a local smokefree buildings policy by the US Department of Veterans Affairs. Assessments were conducted before implementation, and at 1 week and 4 weeks following implementation. Outcomes relevant to this review were only reported for two post-implementation time points. Nursing interventions included encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke to support the strategy.

Erwin 1991 [USA -] reports that 1 week post-implementation, nursing staff ratings of their own overall individual effectiveness (use of strategies, regardless of the number and type) to help inpatients comply with smokefree on the wards by addressing their urge to smoke were 80% and 70% (Wards A and B) 'mildly' or 'moderately effective'; and 75% and 90% (Wards A and B) 'mildly' or 'moderately effective' 4 weeks post-implementation. (Data for 'not effective' or 'very effective' were not reported, no p values calculated). Nursing Interventions used by nursing staff to address a patient's urge to smoke on the psychiatric ward included: encouraging patients to participate in smoking cessation groups; encouraging activities that foster energy replenishment or energy use; promoting the physical benefits of not smoking and preventing harm; individualising care (e.g. p.r.n. medications, "time outs"); and involving significant others in care.

Effectiveness of Supporting Strategies and Interventions for Ensuring Compliance: Mental Healthcare Settings

Evidence statement 1.2: There is **weak** evidence from one interrupted time series in the USA (**Erwin 1991 [-]**) in a **mental healthcare setting** that staff aiding inpatients' compliance through strategies such as encouraging patients to participate in smoking cessation groups and addressing patients' urge to smoke increases patient compliance a local (US Department of Veterans Affairs') smokefree buildings policy. One week post-implementation, nursing staff ratings of their own overall individual effectiveness using policies listed above to help inpatients comply with smokefree on the wards by addressing their urge to smoke increased four weeks post-implementation (no p values calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke.*

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor

smokefree) is already national legislation in the UK. However there is no reason to believe the strategy's effect is not applicable to the UK setting.

3.1.2.2 How does the effectiveness vary for different population groups, by health status or by specialty care services?

There were no sub-group analyses for different population groups, by health status or by specialty care services in the only study (**Erwin 1991 [USA -]**) which specifically looked at the effectiveness of supporting strategies for ensuring compliance with a local (US Department of Veterans Affairs) smokefree buildings policy in a mental healthcare setting.

3.1.3 Supporting Strategies and Indicators of Compliance with Smokefree Policy: Acute and Maternity Settings

As the extent of evidence on the effectiveness of smokefree strategies was limited to two studies, the data presented in the following two sections reviews studies using a comparative design to measure indicators of compliance in settings which had a smokefree policy covering the whole estate or an indoors-only smokefree policy with at least one supporting strategy. This section covers studies conducted in secondary care acute and maternity settings, and is organised into the following six measured outcome sub-headings: staff compliance with smokefree: smoking behaviour; visitor compliance with smokefree: smoking behaviour; patient compliance with smokefree: smoking behaviour; all hospital users compliance with smokefree: smoking behaviour; air quality; and other indicators of smokefree compliance. The subsequent section (Section 3.1.4) covers studies conducted in mental healthcare settings.

Figure 3.1: Study descriptions for studies with supporting strategies and indicators of compliance with smokefree policy: acute and maternity settings

Donchin 2004 [Israel +] before and after study (with different sample)
This study was a process and outcome evaluation of a local (hospital board's) smokefree buildings policy implementation using two successive random-sample surveys among hospital employees, assessing attitudes towards the policy, changes in employee smoking behaviour and short term impact on smoking in unauthorised areas. Assessments were conducted 3 months before and between 6 and 9 months after the policy was introduced. Supporting strategies included an implementation committee, cessation support, smoking shelters erected outside the hospital building, bans on the sale of tobacco products on site, an information campaign 2 months before the policy was introduced, a press conference launch and fines for violations.

Martinez 2008 [Spain +] interrupted time series
This study examined the extent of smoking compliance with tobacco restrictions among hospital employees where a smokefree policy was progressively introduced to comply with national indoor smokefree legislation which came into force in 2005. Assessments were conducted annually for 6 years after policy implementation. Supporting strategies included the closure of smoking rooms and staff training.

Stillman 1990 [USA +] cohort study
This study evaluated a local (hospital board's) smokefree buildings policy in a large urban medical centre among employees at the hospital and school of medicine. Assessments were conducted before and after implementation of the policy. Supporting strategies included written policies, an

implementation committee, cessation support, an internal media and educational campaign and free health checks for employees.

Kvern 2006 [Canada -] before and after study (with different sample)
This study evaluated the processes used to implement a local (regional health authority's) smokefree grounds policy. Assessments were conducted at a single time point before and after the implementation of the policy. Supporting strategies included written policies, an implementation committee, signage, staff meetings, notices in staff payslips, cessation support, pharmacotherapies, temporary abstinence support for inpatients, moving of ashtrays and shelters to the site periphery, staff training, media campaigns, bilingual information sheets for patients and the public and information on health organisations' websites.

Wheeler 2007 [USA –] before and after study
This study measured the impact of a local (university hospital board's) smokefree indoors and outdoors policy on employees and patients at two sites on a hospital campus. Pre ban assessments were conducted between 2003 and 2004; prior to full implementation at site one, and between the implementation of an employee only ban and full ban to also include patients and visitors. Post ban assessments were conducted between August 2004 and October 2005. Supporting strategies included written policies, an implementation committee, posters, staff meetings, letters in staff payslips, patient appointments letters, cessation support, pharmacotherapies and announcements in local media.

Fernandez 2008 [Spain +] before and after study
This study measured airborne nicotine concentrations in public hospitals in Catalonia, Spain to assess changes in second hand smoke exposure after introduction of national indoor smokefree legislation. Assessments were made at a single time point before and after the implementation of smokefree policy. Supporting strategies included cessation support to professionals, patients and visitors, staff training in tobacco control and guaranteeing common follow up and evaluation.

3.1.3.1 Staff Compliance with Smokefree: Smoking Behaviour (Acute & Maternity)

Two cohort studies, one before and after study and one interrupted time series, in an acute and maternity setting reported outcomes relating to staff smoking at work (see study descriptions in Figure 3.1 and Table 2.2 above). All showed an increase in indicators of compliance with local-level smokefree policy or national smokefree legislation.

Donchin 2004's [Israel +] before and after study (with different sample) reported a significant increase in staff smokers reporting they always usually leave their workstation to smoke after implementation of a local (hospital board's) smokefree buildings policy (62.1%) compared with pre-policy (16.9%) ($p<0.0001$). Post-policy self-reported compliance (leaving workstation to smoke) of smokers with the new regulations was associated with occupation: clerical staff (85.7%), nurses (76.5%) and doctors (66.7%) were most likely to comply while technicians (40.0%) and unskilled workers (e.g. cleaners, 47.1%)) were least likely to do so ($p=0.04$). There was no significant association found for gender or years of education. In **Martinez 2008's [Spain +] interrupted time series,** a smokefree policy was introduced progressively from 1997: in 2003, smoking was only permitted in one smoking area exclusively for employees, and in July 2005 the Hospital became entirely smokefree to comply with national indoor smokefree legislation. In a series of annual cross-sectional surveys from 2001-2006, hospital staff were asked whether they smoked in selected smokefree areas. In 2001 "few smokers" (no data given) reported to have smoked inside the nursing rooms and in 2006 no employee respondents reported smoking inside the nursing rooms. In 2004

and 2006, no employees reported smoking in the smokefree cafeteria and the employees' rest areas. A **cohort study** by **Stillman 1990 [USA +]** reported that in the 8 months before the local (hospital board's) smokefree buildings policy was introduced, 2% staff (of 422 staff observed) were recorded actively smoking in two of the hospital cafeterias with a significant decrease to 0% staff (of 330 observed) recorded at 1 and 6 months after the policy was introduced ($p<0.0001$). A similar observation in four lounge areas of the hospital found a significant decrease in observed staff smoking from 39% (of 23 staff observed) to 0% (of 17 staff observed) before and after the smokefree policy was introduced ($p<0.0001$). In **Kvern 2006's [Canada -] before and after study (with different sample)**, the number of contacts security personnel had with staff smokers decreased from 22 in the first month post implementation of a local (regional health authority's) smokefree grounds policy to eight in the second month post-implementation to two in the third month post-implementation.

Staff Compliance with Smokefree: Smoking Behaviour (Acute & Maternity)

Evidence statement 1.3: There is **moderate** evidence from two cohort studies in the USA **(Stillman 1990 [+]**) and Canada (**Kvern 2006 [-])**, one before and after study (**Donchin 2004 [Israel +]**) and one interrupted time series from Spain that (**Martinez 2008 [Spain +])** the implementation of local-level policy and national legislation for smokefree implementation in an **acute and maternity setting** decreases the number of staff smoking.

UK Applicability: This evidence was conducted outside the UK and the policy or national legislation covered in most (indoor smokefree) is already national legislation in the UK however one recent study's policy covers smokefree grounds (a local policy similar to the UK context); there is no reason to believe the effect is not applicable to the UK setting.

(a) Observed Smoking Behaviour: There is evidence from two cohort studies in the USA (**Stillman 1990 [+]** and Canada (**Kvern 2006 [-]**) that the implementation of local smokefree policies in an **acute and maternity setting** decreases the number of staff observed smoking. In the USA, **Stillman 1990 [+]** reported a significant decrease in observed staff smoking in hospital cafeterias and lounge areas at 1 and 6 months after the local (hospital board's) smokefree buildings policy was introduced ($p<0.0001$). ***Supporting strategies*** *included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees*. **Kvern 2006 [-]** in Canada reported that the number of contacts security personnel had with staff smokers on hospital grounds decreased over 1, 2 and 3 months post-implementation of a local (regional health authority's) smokefree grounds policy. ***Supporting strategies*** *included written policies, an implementation committee, signage, staff meetings, notices in staff payslips, cessation support, pharmacotherapies, temporary abstinence support for inpatients, moving of ashtrays and shelters to the site periphery, staff training, media campaigns, bilingual information sheets for patients and the public and information on health organisations' websites.*

(b) Self-reported Smoking Behaviour: There is evidence from one before and after study in Israel (**Donchin 2004 [+]**) and one interrupted time series in Spain (**Martinez 2008 [+]**) that local-level policy and national legislation for smokefree implementation with supporting strategies decreases staff self-reported smoking during working hours in an **acute and maternity setting**. **Donchin 2004 [+]** in Israel reported a significant increase in staff smokers reporting they always usually leave their workstation to smoke following the implementation of a local (hospital board's) smokefree buildings policy, measured 3 months before and 6-9 month after implementation ($p<0.0001$). ***Supporting strategies*** *included an implementation committee, cessation support, smoking shelters erected outside the hospital building, bans on the sale of tobacco products on site, an information campaign 2 months before the policy was introduced, a press conference launch and fines for violations*. **Martinez 2008 [+]** reported that in 2001 "few smokers" (no data given) reported to have smoked

inside the nursing rooms and, following the implementation of national indoor smokefree legislation in Spain in 2005, no employee respondents reported smoking inside the nursing rooms in 2006. In 2004 and 2006, no employees reported smoking in the smokefree cafeteria and the employees' rest areas. ***Supporting strategies*** *included the closure of smoking rooms and tobacco control training for nurses*.

3.1.3.2 Visitor Compliance with Smokefree: Smoking Behaviour (Acute & Maternity)

One cohort study and one before and after study in an acute and maternity setting reported outcomes relating to visitors' smoking (see study descriptions in Figure 3.1 and Table 2.2 above). All showed an increase in indicators of compliance with local-level smokefree policy.

In the **cohort study** by **Stillman 1990 [USA +],** during the 8 months before the local (hospital board's) smokefree buildings policy was introduced, 13% visitors (of 424 visitors observed) were recorded actively smoking in two of the hospital cafeterias with a significant decrease to 0.3% visitors (equivalent to 1 visitor of 329 observed) recorded at 1 and 6 months after the policy was introduced ($p<0.0001$). A similar observation in four lounge areas of the hospital found a significant decrease in observed visitors smoking from 41% (of 64 visitors observed) to 0% (of 68 visitors observed) before and after the smokefree policy was introduced ($p<0.0001$). In **Kvern 2006's [Canada -] before and after study (with different sample)**, the number of contacts security personnel had with visitor smokers decreased from 173 in the first month post implementation of a local (regional health authority's) smokefree grounds policy to 86 in the second month post-implementation to 26 in the third month post-implementation.

Visitor Compliance with Smokefree: Smoking Behaviour (Acute & Maternity)

Evidence statement 1.4: There is **weak** evidence from two cohort studies, one in the USA **(Stillman 1990 [+])** and one in Canada **(Kvern 2006 [-])**, in an **acute and maternity setting** that implementation of local smokefree policies with supporting strategies decreases hospital visitor smoking.

UK Applicability: This evidence was conducted outside the UK, however one of the two studies' policy covers smokefree grounds (a policy implemented in parts of the UK) and there is no reason to believe the effect is not applicable to the UK setting.

In the USA, **Stillman 1990 [+]** reported a significant decrease in observed visitor smoking in hospital cafeterias and lounge areas at 1 and 6 months after the local (hospital board's) smokefree buildings policy was introduced ($p<0.0001$). ***Supporting strategies*** *included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees*. **Kvern 2006 [-]** in Canada reported that the number of contacts security personnel had with visitor smokers on hospital grounds decreased over 1, 2 and 3 months post-implementation of a local (regional health authority's) smokefree grounds policy. ***Supporting strategies*** *included: written policies, an implementation committee, signage, staff meetings, notices in staff payslips, cessation support, pharmacotherapies, temporary abstinence support for inpatients, moving of ashtrays and shelters to the site periphery, staff training, media campaigns, bilingual information sheets for patients and the public and information on health organisations' websites*.

3.1.3.3 Patient Compliance with Smokefree: Smoking Behaviour (Acute & Maternity)

One before and after study in acute and maternity setting reports outcomes relating to patients observed smoking in hospital grounds (see study descriptions in Figure 3.1 and Table 2.2 above). It showed an increase in indicators of compliance with local-level smokefree policy.

Kvern 2006's [Canada -] before and after study (with different sample) reported that the number of contacts security personnel had with inpatient smokers decreased from 65 in the first month post implementation of a local (regional health authority's) smokefree grounds policy to 14 in the second month post-implementation to 16 in the third month post-implementation.

Patient Compliance with Smokefree: Smoking Behaviour (Acute & Maternity)

Evidence statement 1.5: There is **weak** evidence from one before and after study in Canada (**Kvern 2006 [-]**) about the impact of local smokefree policies with supporting strategies on inpatient smoking behaviour in an **acute and maternity setting**.

UK Applicability: This evidence was conducted outside the UK, however the policy covers smokefree grounds (a policy implemented in parts of the UK) and there is no reason to believe the effect is not applicable to the UK setting.

There is **weak** evidence from one cohort study in Canada (**Kvern 2006 [-]**) that the number of inpatients challenged about smoking on hospital grounds by security personnel decreased over 1, 2 and 3 months post-implementation of a local (regional health authority's) smokefree grounds policy with supporting strategies. ***Supporting strategies*** *included written policies, an implementation committee, signage, staff meetings, notices in staff payslips, cessation support, pharmacotherapies, temporary abstinence support for inpatients, moving of ashtrays and shelters to the site periphery, staff training, media campaigns, bilingual information sheets for patients and the public and information on health organisations' websites*.

3.1.3.4 All Hospital Users' Compliance with Smokefree: Smoking Behaviour (Acute & Maternity)

Two before and after studies in an acute and maternity setting, report outcomes relating to observed smoking in contrary to smokefree policy (see study descriptions in Figure 3.1 and Table 2.2 above). All showed an increase in indicators of compliance with local-level smokefree policy.

In a **before and after study (with different sample)**, **Donchin 2004 [Israel +]** found a significant reduction in observed smoking (by employees, patients, or visitors) in unauthorized areas was reported by staff in the hospital building after implementation of a local (hospital board's) smokefree buildings policy: frequently observe smoking in unauthorized places (63.2% pre- vs. 41.4% post-, p value not given), occasionally observe smoking in unauthorized places (22.6% pre- vs. 16.3% post-, p value not given), never observe smoking in unauthorized places (14.2% pre- vs. 42.3% post-, $p<0.001$). Smokers and non-smokers responded similarly in the pre-policy survey. However, smokers were less likely to report observation of smoking in unauthorized places than non-smokers post-policy ($p=0.03$). No significant association was found for gender, age or occupation. **Kvern 2006's [Canada -] before and after study (with different sample)** reported that, over 6 days of observation covering five locations and four standard break-times, 1 month before implementation of a local (regional health authority's) smokefree grounds policy n=314 (tertiary care centre) and n=115 (long-term care facility) people were observed smoking on facility grounds. Post-policy, at the same times and locations 1 month later, the number of people observed smoking on facility grounds

had reduced to n=32 (tertiary care centre) and n=6 (long-term care facility). No further statistical analysis was provided.

All Hospital Users' Compliance with Smokefree: Smoking Behaviour (Acute & Maternity)

Evidence statement 1.6: There is **weak** evidence from two before and after studies in Canada (**Kvern 2006 [-])** and Israel (**Donchin 2004 [+]**) in an **acute and maternity setting** that local smokefree policy implementation with supporting strategies decreases observed smoking amongst all hospital users as a whole (patients, staff and visitors).

UK Applicability: This evidence was conducted outside the UK, however one of the two studies' policy covers smokefree grounds (a policy implemented in parts of the UK) and there is no reason to believe the effect is not applicable to the UK setting.

In Israel, **Donchin 2004 [+]** reported a significant reduction in observed smoking (p<0.001), frequently observed smoking (p value not reported) and occasionally observed smoking (p value not reported) by employees of other employees, patients, or visitors in unauthorized areas in the hospital following the implementation of a local (hospital board's) smokefree buildings policy, measured 3 months before and 6-9 month after implementation. ***Supporting strategies*** *included an implementation committee, posters/signage, staff letters/payslip notes, incorporating the policy launch with World No Tobacco Day, notices on staff bulletin boards and notification by supervisors*. In Canada, **Kvern 2006 [-]** reported that the number of people observed smoking on facility grounds had reduced between 1 month pre-implementation of a local (regional health authority's) smokefree grounds policy and 1 month post-implementation. ***Supporting strategies*** *included written policies, an implementation committee, signage, staff meetings, notices in staff payslips, cessation support, pharmacotherapies, temporary abstinence support for inpatients, moving of ashtrays and shelters to the site periphery, staff training, media campaigns, bilingual information sheets for patients and the public and information on health organisations' websites*.

3.1.3.5 Air Quality in Acute & Maternity Settings

Two before and after studies and two cohort studies report outcomes relating to air quality in an acute and maternity setting (see study descriptions in Figure 3.1 and Table 2.2 above). All showed an increase in indicators of compliance with local-level smokefree policy or national smokefree legislation.

Two studies used objective measures of air quality. A **before and after study** by **Fernandez 2008 [Spain +]**, reported that 198 standard locations across 44 hospitals were sampled for vapour-phase nicotine before and after the implementation of a smokefree policy to comply with national indoor smokefree legislation (in Sep-Dec '05 and in Sep-Dec '06 respectively). Airborne nicotine was detected in 96.5% of the locations in 2005 (191/198) and decreased to 66.2% of the locations in 2006 (131/198 sample). No p-value reported. The overall median nicotine concentration level significantly declined by 56.5%, from 0.23 mcg/m3 (IQR, 0.13–0.63) in 2005 (pre-implementation) to 0.10 mcg/m3 (Inter quartile range (IQR) 0.02–0.19) in 2006 (post-implementation) (p<0.01). There were no sub-group differences in median nicotine concentrations before and after smokefree implementation by the type of hospital (county, reference or university) or the size of hospital (number of beds and number of employees). Median nicotine concentration levels declined significantly in all seven locations measured across the 44 hospitals between 2005 and 2006.

Before smokefree implementation to comply with the legislation, median nicotine concentrations were highest in cafeterias (0.62 mcg/m^3, IQR 0.23–3.43), followed by top-floor fire escapes (0.31 mcg/m^3, IQR 0.14–0.87) dropping by 83.9% (to 0.10 mcg/m^3, IQR 0.02–0.18) and by 51.6% (to 0.15 mcg/m3, IQR, 0.02–0.22), respectively (p<0.01). Before smokefree legislation, median nicotine concentrations were lowest in staff dressing rooms (in the surgical area) (0.18 mcg/m^3, IQR 0.18–1.17) dropping by 83.3% (to 0.03 mcg/m^3, IQR 0.02–0.22, p<0.05). The greatest declines in median nicotine concentration levels after smokefree implementation occurred in general surgery hospitalization unit corridors, dropping by 97.8% (from 0.23 mcg/m^3, IQR 0.09–0.42) to concentrations under the limit of quantification (0.01 mcg/m^3, IQR 0.01–0.14, p<0.01); and in general medicine hospitalization unit corridors, dropping by 97.2% (from 0.18 mcg/m^3, IQR 0.10–0.33) to concentrations also under the limit of quantification (0.01 mcg/m^3, IQR 0.01–0.10, p<0.01).

Following the implementation of smokefree to comply with national legislation, airborne nicotine concentrations declined to a lesser extent in the emergency department waiting rooms, by 30.4% (from 0.23 mcg/m^3 (IQR 0.15–0.52) to 0.16 mcg/m^3 (IQR 0.7–0.24), p<0.01), and at the main hall entrance, by 31.6% (from 0.19 mcg/m^3 (IQR 0.13–0.63) to 0.13 mcg/m^3 (IQR 0.06–0.22), p<0.01). For the 33 hospitals where airborne nicotine concentrations levels were measured in the cafeterias, before the smokefree legislation was implemented, smoking was still totally permitted in the cafeteria in 3 hospitals, partially permitted in the cafeteria in six hospitals and already totally prohibited in the cafeteria in 24 hospitals. The median nicotine concentrations were highest in cafeterias where smoking was partially permitted (3.67 mcg/m^3 (IQR, 3.04–6.25)) and totally permitted before the ban (3.61 mcg/m^3 (IQR, 0.82–11.48)) dropping by 93.2% (to 0.25 mcg/m^3 (IQR, 0.03–0.42), p<0.01) and by 97.0% (to 0.11 mcg/m^3 (IQR, 0.05–0.19), p=0.109) after the ban, respectively. The median nicotine concentration level was already low in hospital cafeterias where smoking was already prohibited in 2005 (0.48 mcg/m^3 (IQR 0.18–0.68)) and declined by 81.3% after implementation (to 0.09 mcg/m^3 (IQR, 0.02–0.17), p<0.01).

In a **cohort study, Stillman 1990 [USA +]** used passive diffusion nicotine monitors to measure atmospheric nicotine vapour as a proxy for environmental tobacco smoke (ETS) levels in seven indoor locations around the hospital at 1 and 8 months pre-implementation of a local (hospital board's) smokefree buildings policy and 8 months post-implementation. In six locations there was a significant decrease in median levels of nicotine concentrations after smokefree was implemented: in visitor/patient waiting areas (from 3.88 to 0.28 mcg/m^3) and in cafeterias (from 7.06 to 0.22 mcg/m^3) (both p<0.001); in staff lounges (from 2.43 to 0.12 mcg/m^3) and in offices (from 2.05 to 0.12 mcg/m^3) (both p<0.01); in corridors and elevators (from 2.28 to 0.20 mcg/m^3) and in patient areas (from 0.84 to 0.12 mcg/m^3) (both p<0.05). The decrease in median concentration of vapour-phase nicotine in restrooms of to 17.71 to 10.00 mcg/m^3 was not significant, and the levels of ETS were high before and after implementation of smokefree.

Wheeler 2007 [USA -] in a **before and after study** reported that significantly fewer employees at site one reported that they had to walk through cigarette smoke on campus after implementation of a local (university hospital board's) smokefree indoors and outdoors policy than before implementation (18.0% vs. 43.1%, p<0.0001). In the **interrupted time series** by **Martinez 2008 [Spain +]**, it is reported that smokefree policy was introduced progressively from 1997: in 2003, smoking was only permitted in one smoking area exclusively for employees, and in July 2005 the Hospital became entirely smokefree to comply with national indoor smokefree legislation in Spain. In a series of annual cross-sectional surveys from 2001-2006, hospital staff were asked to estimate the number of hours they are exposed to environmental tobacco smoke during their shift. The proportion of employees who reported working in a smokefree environment (i.e. reported exposure to ETS for 0 hours during their shifts) increased significantly from 33.0% (95% CI: 26.2-39.7) in 2001

(pre-implementation) to 91.4% (95% CI: 87.3-94.6) in 2006 (1 year post-implementation). One year after smokefree implementation, some hospital employees still reported being exposed to ETS during their shifts: 5.3% (95% CI: 2.4-8.1) were exposed for <1 hour in 2006 (a significant decrease from 46.3% in 2001 (95% CI: 39.1-53.4)); and 1% (95% CI: 0-2.2) were exposed for 1 to 4 hours in 2006 (a significant decrease from 18.1% in 2001 (95% CI: 12.6-23.6)).

Air Quality in Acute & Maternity Settings

Evidence statement 1.7: There is evidence from two before and after studies, one in the USA **(Wheeler 2007 [-]** and one in Spain **(Fernandez 2008 [+]**), one interrupted time series in Spain **(Martinez 2008 [+])** and one cohort study in the USA **(Stillman 1990 [USA +])** about the impact of local-level policy and national legislation for smokefree on air quality in an **acute and maternity setting**.

UK Applicability: This evidence was conducted outside the UK and the policy or national legislation covered in most (indoor smokefree) is already national legislation in the UK, however one study's policy covers smokefree grounds and buildings (a policy implemented in parts of the UK); there is no reason to believe the effect is not applicable to the UK setting.

(a) There is **moderate** evidence from one before and after study in Spain (**Fernandez 2008 [+]**) and one cohort study in the USA (**Stillman 1990 [+]**) using objective measures that local-level policy and national legislation for smokefree implementation with supporting strategies decreases atmospheric nicotine vapour measurements. **Fernandez 2008 [+]** in Spain reported that median nicotine concentration levels declined significantly in all seven locations measured across the 44 hospitals over the 4 months pre-implementation to the same period 1 year post-implementation of national indoor smokefree legislation in Spain. The overall median nicotine concentration level significantly declined from pre- to post-implementation ($p<0.01$). There were no sub-group differences in median nicotine concentrations before and after indoor smokefree legislation implementation by the type or size of hospital and number of employees. ***Supporting strategies*** *included cessation support to professionals, patients and visitors, staff training in tobacco control and guaranteeing common follow up and evaluation*. In the USA, **Stillman 1990 [USA +]** reported a significant decrease in median levels of nicotine concentrations 8 months after the local (hospital board's) smokefree buildings policy was implemented, compared with 8 months before implementation: in visitor/patient waiting areas and in cafeterias (both $p<0.001$); in staff lounges and in offices (both $p<0.01$); in corridors and elevators and in patient areas (both $p<0.05$). ***Supporting strategies*** *included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees*.

(b) There is **weak** evidence from one before and after study in the USA (**Wheeler 2007 [-]**) and one interrupted time series in Spain (**Martinez 2008 [+]**) that local-level policy and national legislation for smokefree implementation with supporting strategies decreases perceived or actual exposure to environmental tobacco smoke (subjective measures). In the USA, **Wheeler 2007 [USA -]** reported significantly fewer employees claiming that they had to walk through cigarette smoke on campus 10 months after the implementation of a local (university hospital board's) smokefree indoors and outdoors policy, than 3 months before the policy ($p<0.0001$). ***Supporting strategies*** *included written policies, an implementation committee, posters, staff meetings, letters in staff payslips, patient appointments letters, cessation support, pharmacotherapies and announcements in local media*. In Spain, **Martinez 2008 [+]** reported the proportion of employees who claimed to work in a smokefree environment increased significantly from 2 years pre- to 1 year post-implementation of national indoor smokefree legislation in Spain, 95% CI: 26.2-39.7 in 2001 to 95% CI: 87.3-94.6 in 2006. The

proportion who reported they were exposed for <1 hour and for 1-4 hours decreased significantly from pre to post ban. ***Supporting strategies*** *included the closure of smoking rooms and staff training*.

3.1.3.6 Other Indicators of Smokefree Compliance (Acute & Maternity)

One cohort study used other indicators of compliance with local-level smokefree buildings policy. It measured the quantity of cigarette butts in ashtrays, and examined records for fire incidents due to negligent smoking.

Cigarette Butts from Ashtrays

One cohort study in an acute and maternity setting reported outcomes relating to the presence of cigarette butts from ashtrays (see study descriptions in Figure 3.1 and Table 2.2 above). The study found mixed results but an increase in indicators of compliance with local-level smokefree policy in most of the locations measured.

In a **cohort study, Stillman 1990 [USA +]**, morning and afternoon counts of cigarette butts from ashtrays at the hospital's elevator lobbies, waiting lounges and hospital entrances at the parking garages were conducted monthly in the 6 months before implementation of a local (hospital board's) smokefree buildings policy and at one, 3 and 6 months following implementation. (Ashtrays remained in place after implementation as they were wall-mounted). A significant reduction of 80.7% in counts was recorded in the elevator lobby areas after smokefree implementation (from n=958 to n=184, $p<0.01$) and a significant decrease of 96.8% was recorded in the waiting lounges after implementation (from n=342 to n=11, $p<0.01$). There was a non-significant increase of 7.7% in the number of butts recorded in ashtrays at the hospital entrances at the parking garages (from n=90 to n=97); the change was only significant ($p<0.05$) for the morning count in this location which increased by 88.2% (from n=17 to n=32).

Fire Incidents Due to Negligent Smoking

One cohort study in an acute and maternity setting reports outcomes relating to fires caused by negligent smoking (see study descriptions in Figure 3.1 and Table 2.2 above), which showed an increase in compliance with local-level smokefree buildings policy.

Stillman's 1990 [USA +] cohort study reports that in the 4 years preceding the implementation of a local (hospital board's) smokefree buildings policy, there was an average of 20 fire incidents per year in the hospital (range, 12-29 incidents). There were no fire incidents due to negligent smoking within the first year of the smokefree policy.

Other Indicators of Smokefree Compliance (Acute & Maternity)

Evidence statement 1.8: There is **inconsistent** evidence from one cohort study in the USA (**Stillman 1990 [+]**) in an **acute and maternity setting** that implementation of the local smokefree buildings policy with supporting strategies decreases the presence of cigarette butts in ashtrays. In the USA, **Stillman 1990 [+]** found a significant reduction in counts in indoor locations: the elevator lobby areas ($p<0.01$) and waiting lounges ($p<0.01$) in the 6 months after smokefree implementation of the local (hospital board's) smokefree buildings policy compared with the 6 months before. There was a non-significant increase in the number of butts recorded in ashtrays at the hospital entrances at the parking garages and the change was only significant ($p<0.05$) for the morning count in this location.

Supporting strategies *included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees*.

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the effect is not applicable to the UK setting.

Evidence statement 1.9: There is **weak** evidence from one cohort study in the USA **(Stillman 1990 [+])** in an **acute and maternity setting** that implementation of the local (hospital board's) smokefree buildings policy with supporting strategies decreases fire incidents due to negligent smoking between the total 4 years before implementation to the total 1 year after implementation. ***Supporting strategies*** *included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees.*

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the effect is not applicable to the UK setting.

3.1.4 Supporting strategies and indicators of compliance with smokefree policy: Mental Healthcare Settings

This section covers studies conducted in mental health settings, and is organised into the following three measured outcome sub-headings: patient compliance with smokefree: requests to terminate smoking; patient compliance with smokefree: smoking-related contraband; and air quality in mental healthcare settings.

Figure 3.2: Study descriptions for studies with supporting strategies and indicators of compliance with smokefree policy: mental healthcare settings

Erwin 1991 [USA -] interrupted time series
This study presents the reactions of 29 nursing staff members on two inpatient psychiatric wards at a Veterans Affairs hospital who experienced the transition to smoke-free status with the introduction of a local (US Department of Veterans Affairs) smokefree buildings policy. Assessments were conducted before implementation, and at 1 week and 4 weeks following implementation. Outcomes relevant to this review were only reported for two post-implementation time points. Nursing interventions included encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke to support the strategy.

Patten 1995 [USA +] uncontrolled before and after study (with different sample)
This study evaluates the effect of a local (hospital board's) smokefree buildings and smokefree grounds policy on the behaviour of inpatients. Hospital chart data were examined for the 3 months prior to implementation and the 3 months post implementation. The strategy was supported by an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence.

Matthews 2005 [USA -] uncontrolled before and after study (with different sample)
This study aimed to evaluate the implementation of a local (hospital's) smokefree buildings policy on an acute crisis stabilization (psychiatric) unit for men. Assessments were conducted with 14 staff 3 months prior to implementation and 13 staff 3 months post-implementation. The strategy was supported by patient education about nicotine addiction and withdrawal and pharmacotherapies.

Rauter 1997 [USA +] cohort study
This study described the effects of a local (hospital's) smokefree buildings policy (introduced on January 1st 1991) in a major 145-bed psychiatric hospital, focussing on assault rates and other indicators. Assessments were made twice pre implementation at 15 months (Oct '89-Mar '90) and 3 months (Oct '90-Dec '90), immediately after implementation (Jan '91-Mar '91) and 1 year post implementation (Jan '92-Jun '92). Patients wishing to participate in smoking reduction workshops were urged to do so, but no other supporting strategies for the policy were reported.

Etter 2008 [Switzerland +] uncontrolled before and after study (with different sample)
This study compares the acceptability and efficacy of a partial and total smoking ban (via the local (hospital administration's) smokefree buildings policy) amongst 240 patients and staff in an inpatient psychiatric hospital. Assessments were conducted prior to implementation, 2 months post partial implementation, 20 months post partial implementation/pre total implementation and 3 to 5 months post total implementation of the smokefree buildings policy. The strategy was supported by posters and/or signage, cessation support, pharmacotherapies, closure of smoking rooms and staff training.

Vorspan 2009 (before and after study in different sample and cross sectional study, France, +)
This study evaluated smoking exposure in employees of a psychiatric facility in France, after the implementation of national indoor smokefree legislation in France. Assessments were conducted 1 month before and 1 month after the introduction of the policy. Supporting strategies included pharmacotherapies for patients and staff, closure of smoking rooms and evaluation of patients for smoking breaks.

3.1.4.1 Patient Compliance with Smokefree: Requests to Terminate Smoking (Mental Healthcare)

One interrupted time series and one before and after study in a mental healthcare setting reported outcomes relating to patients' compliance by requests from staff to terminate their smoking (see study descriptions in Figure 3.2 and Table 2.1 above). All showed a decrease in indicators of compliance with local-level smokefree policy.

In **Erwin's 1991 [USA -] interrupted time series**, there was an increase in the proportion of nursing staff reporting that they requested patients to terminate smoking a lit cigarette, from 30% and 20% (Wards A and B) 1 week post-implementation to 63% and 40% respectively 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated). In **Patten's 1995 [USA +] uncontrolled before and after study** examining hospital chart data, there was a significant increase in the frequency of smoking in the hospital room from zero to 18 instances between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy ($p<0.05$).

Inpatient Compliance with Smokefree: Requests to Terminate Smoking (Mental Healthcare)

Evidence statement 1.10: There is **weak** evidence from one interrupted time series in the USA **(Erwin 1991 [-])** and one before and after study in the USA (**Patten 1995 [+]**) that implementation of local smokefree policies, one indoors only **(Erwin 1991 [-])** and one indoors and outdoors (**Patten 1995 [+]**, both in the USA), with supporting strategies may increase inpatient smoking violations in a **mental healthcare setting.**

UK Applicability: This evidence was conducted outside the UK and the policy covered in one (indoor smokefree) is already national legislation in the UK however the other study's policy covers smokefree grounds and buildings (a policy implemented in parts of the UK); there is no reason to believe the effect is not applicable to the UK setting.

One interrupted time series (**Erwin 1991 [USA -]**) reported an increase in nursing staff requesting inpatients cease smoking a lit cigarette, between 1 week post-implementation and 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke*. One before and after study (**Patten 1995 [USA +]**) found that the frequency of smoking in the hospital room according to chart reports increased significantly between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy ($p<0.05$). ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence*.

3.1.4.2 Patient Compliance with Smokefree: Smoking-Related Contraband (Mental Healthcare)

One before and after study, one cohort study and one interrupted time series, all in a mental healthcare settings reported outcomes relating to patient's smoking-related contraband (see study descriptions in Figure 3.2 and Table 2.1 above). All showed a decrease in indicators of compliance with local-level smokefree policy.

In an **uncontrolled before and after study (with different sample) (Matthews 2005 [USA -])**, two of the 14 nursing staff respondents anticipated an increase in male inpatients' smoking-related contraband 3 months before the local (hospital's) smokefree buildings policy was implemented. There was a significant increase to seven of 13 respondents reporting a perceived increase in contraband post-implementation ($p=0.05$). No significant differences were found between the 3 months before and after the ban was implemented related to the total number of instances of contraband.

Rauter's 1997 [USA +] cohort study, using data from hospital incident reports found 25 reports of possession of unauthorised cigarettes or matches in the 3 months prior to the implementation of a local (hospital's) smokefree buildings policy, 20 of these reports in the final month. There was an increase to 36 reports of contraband possession in the first 3 months of the smokefree policy. For the same period 1 year later, 12 incidents of contraband possession were recorded. (No further statistical analysis was provided.)

In **Erwin's 1991 [USA -] interrupted time series**, there was a decline in the proportion of nursing staff reporting that they had discouraged family or significant others from "smuggling" cigarettes to inpatients, from 40% and 75% (Wards A and B) 1 week post-implementation to 20% and 60% respectively 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated).

Inpatient Compliance with Smokefree: Smoking-Related Contraband (Mental Healthcare)

Evidence statement 1.11: There is **weak** evidence from one before and after study in the USA (**Matthews 2005 [-]**), one interrupted time series in the USA **(Erwin 1991 [-])** and one cohort study in the USA **(Rauter 1997 [+])** in **mental health settings** that local policies for smokefree implementation indoors with supporting strategies increases occurrences of inpatient's smoking related contraband, although this is not maintained.

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the effect is not applicable to the UK setting.

Matthews 2005 [-] in the USA reported that 3 months after the implementation of a local (hospital's) smokefree buildings policy, there was a rise in nursing staff respondents reporting a *perceived* increase in male inpatients' smoking-related contraband post-implementation compared with respondents *anticipating* an increase in male inpatients' smoking-related contraband 3 months pre-implementation (p=0.05). No significant differences were found between the total number of recorded instances of contraband related to the 3 months before and 3 months after the smokefree policy was implemented. ***Supporting strategies*** *included patient education about nicotine addiction and withdrawal and pharmacotherapies*. **Erwin 1991 [-]** in the USA reported a decline in nursing staff reporting that they had discouraged family or significant others from "smuggling" cigarettes to inpatients, between 1 week post-implementation and 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values were calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke*. **Rauter 1997 [-]** in the USA reported instances of possession of unauthorised cigarettes and matches were raised in the 3 months before a local (hospital's) smokefree buildings policy was initiated in the psychiatric hospital's buildings, and in the first 3 months of smokefree. For the same period 1 year later, recorded incidents of contraband possession had dropped by two-thirds (no statistical analysis reported). *Patients wishing to participate in smoking reduction workshops were urged to do so, but no other supporting strategies for the policy were reported*.

3.1.4.3 Air Quality in Mental Healthcare Settings

Two before and after studies in a mental healthcare setting reported outcomes relating to perceived or actual exposure environmental tobacco smoke (ETS); and one of these before and after studies also reported outcomes relating to annoyance from (ETS) (see study descriptions in Figure 3.2 and Table 2.1 above). All showed an increase in indicators of compliance with local-level smokefree policy or national smokefree legislation.

In **Etter's 2008 [Switzerland +] uncontrolled before and after study** (with different samples), between 2003 (2 years pre-) and 2006 (1 year post-implementation of a local (hospital administration's) smokefree buildings policy), there was a significant increase in the percentage of non-smoker inpatients reporting that they were 'absolutely not' annoyed by ETS in their unit in bedrooms (61.5% to 76.9%, p=0.108), in dining rooms (38.5% to 80.8%, p=0.007) and in corridors (38.5% to 69.2%, p=0.162). For the same time period, there was a significant increase in the percentage of non-smokers staff reporting that they were 'absolutely not' annoyed by ETS in their unit in dining rooms (31.0% to 81.00%, p<0.001) and a significant increase in bedrooms (23.8% to 45.2%, p=0.095), and in corridors (23.8% to 52.4%, p=0.023). After the 2006 total ban, 15.8% of non-smokers (staff and inpatients) reported that they were 'a lot' or 'somewhat' annoyed by ETS in their

unit in bedrooms, 13.6% in corridors and 1.8% in dining rooms (no p values given). Non-smoker staff reported more annoyance from ETS than inpatients across all surveys.

The same study (**Etter 2008 [Switzerland +]**) examined perceived or actual exposure to environmental tobacco smoke. Between 2003 (2 years pre-) and 2006 (1 year post-implementation of a local (hospital administration's) smokefree buildings policy), there was a non-significant increase in the percentage of non-smoker inpatients reporting that they were 'never' exposed to ETS in their unit in bedrooms (69.2% to 88.5%, p=0.058), in dining rooms (30.8% to 73.1%, p=0.09) and in corridors (23.1% to 65.4%, p=0.029). Over the same time period, there was a significant increase in the proportion of non-smoker staff reporting that they were 'never' exposed to ETS in their unit in bedrooms (16.7% to 31.0%, p=0.041), in dining rooms (26.2% to 71.4%, p=0.004) and in corridors (9.5% to 38.1%, p=0.006). After the 2006 total ban, 31% of non-smokers (staff and inpatients) reported that they were 'often' or 'sometimes' exposed to ETS in their unit in bedrooms, 12.0% were 'often' exposed to ETS in corridors (no p values given) and none reported that they were 'often' exposed to ETS in dining rooms and offices. Non-smoker staff reported more exposure to ETS than inpatients across all surveys.

In a before and after study, with the same sample after (**Vorspan 2009 [France +]**), reported that 1 month before the implementation of national indoor smokefree legislation in France, 83% (n=34) of non-smoking staff in the psychiatry department had a median of 0ng/ml cotinine level, thus defined as "non-exposed" to ETS at work (cotinine ≤25ng/ml); 17% (n=7) of the staff had cotinine levels >25ng/ml and were defined as "exposed" to ETS at work pre-legislation. (Exposed sub-sample characteristics: none lived with a smoker; occupation: nurse-assistant (n = 4), nurse (n = 2), pharmacist (n = 1); mean age 47 years; n=5 women; all worked on the ground floor (44% ground floor staff)). One month after the implementation of a national indoor smoking legislation, 83% (n=34) of non-smoking staff in the psychiatry department remained "non-exposed" to ETS at work (median of 0ng/ml cotinine level). In the sub-sample of "exposed" non-smokers (n=7), 1 month after the implementation of an indoor smoking legislation there was a significant 8ng/ml decrease in mean cotinine level from 40 (SD=17) ng/ml pre-legislation to 32 (SD=8) ng/ml post-legislation (p=0.045) but this sub-sample remained "exposed" (>25ng/ml) cotinine.

Air Quality in Mental Healthcare Settings

Evidence statement 1.12: There is **moderate** evidence from two before and after studies, one in Switzerland **(Etter 2008 [+]** and one in France **(Vorspan 2009 [+])**, about the impact of local-level policy and national legislation for smokefree implementation on air quality in a **mental healthcare setting**. Both studies found that indoor smokefree implementation with supporting strategies decreases perceived or actual exposure to environmental tobacco smoke, whereas the Swiss study (**Etter 2008 [+])** also reported that non-smoking inpatient and staff reports of annoyance from environmental tobacco smoke also decreased after the implementation of the local indoor smokefree policy.

UK Applicability: This evidence was conducted outside the UK and the policy or national legislation covered (indoor smokefree) is already national legislation in the UK however there is no reason to believe the effect is not applicable to the UK setting.

(a) Impact on Hospital Staff: From 2 years pre- to 1 year post-implementation of a local (hospital administration's) smokefree buildings policy, **Etter 2008 [+]** in Switzerland found there was a significant increase in the percentage of non-smokers staff reporting that they were 'absolutely not' annoyed by ETS in their unit in dining rooms (p<0.001) and corridors (p=0.023). Between 2003 (no

indoor smokefree policy) and 2006 (total indoors smokefree), there was a significant increase in the proportion of non-smoker staff reporting that they were 'never' exposed to ETS in their unit in bedrooms (p=0.041), dining rooms (p=0.004) and corridors (p=0.006). Non-smoker staff reported more exposure to ETS than patients across all surveys. ***Supporting strategies*** *included signage, cessation support, pharmacotherapies, closure of smoking rooms and staff training*. **Vorspan 2009 [+]** in France reported that in a sub-sample of staff classified as "exposed" [to ETS] non-smokers pre-ban, 1 month after the implementation of national indoor smokefree legislation in France there was a significant decrease in mean cotinine level (p=0.045). ***Supporting strategies*** *included pharmacotherapies for patients and staff, closure of smoking rooms and evaluation of patients for smoking breaks*.

(b) Impact on Inpatients: From 2 years pre- to 1 year post-implementation of a local (hospital administration's) smokefree buildings policy, **Etter 2008 [+]** in Switzerland found there was a significant increase in the percentage of non-smoker inpatients reporting that they were 'absolutely not' annoyed by ETS in their unit in dining rooms (p=0.007). Between 2003 (no indoor smokefree policy) and 2006 (total indoors smokefree), there was a non-significant increase in the percentage of non-smoker inpatients reporting that they were 'never' exposed to ETS in their unit in corridors (p=0.029). ***Supporting strategies*** *included signage, cessation support, pharmacotherapies, closure of smoking rooms and staff training*.

3.2 Q2: Are There Any Unintended Consequences from Adopting Smokefree Approaches in Acute And Maternity Care Settings?

Nine studies were identified and included in the review which addressed this question. The outcomes measures of effects of smokefree implementation for each study are presented in Table 3.2 and the studies are summarised in full detail in the evidence tables in Appendix 7.

This section covers studies conducted in secondary care acute and maternity settings, and is organised into the following two measured outcome sub-headings: other consequences from smokefree for patients; and other consequences from smokefree for staff. The findings from the studies are presented (studies are annotated with the country and internal validity score in parentheses following the citation).

Table 3.2: Outcome measures of other consequences from smokefree by type of ban & study

Title Study design	Type of ban	Outcomes measured: other consequences from smokefree implementation
Smokefree Grounds		
Hudzinski 1990 [USA +] **Uncontrolled before-and-after study (with same sample after intervention)**	Smokefree building(s) Smokefree "other description": *A "comprehensive campus-wide smokefree environment"* Ban exclusions: *Patient smoking permitted on the acute psychiatry inpatient unit by physician approval*.	Number of staff by smoking behaviours (smoking status, cigs per day, smoking during/after work hours) (all self-reported using Likert-scales) Number of staff by cessation intention and behaviour (all self-reported using Likert-scales)
Gadomski 2010 [USA +] **Uncontrolled before-and-after study (with different sample after intervention)** ***Patient sample*** **Uncontrolled before-and-after study (with same sample after intervention)** ***Staff sample***	Smokefree building(s) Smokefree doorways/entrances Smokefree grounds *No description of how comprehensive grounds ban is.*	Number of patients signing out against medical advice (hospital records) Mean inpatient volume per month (hospital records) Rates of inpatients smoking (self-report to admitting nurse) Number of NRT prescriptions for inpatients (hospital records) Rates of staff smoking (self-reported)
Wheeler 2007 [USA -] **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree building(s) Smokefree vehicles Smokefree grounds Smokefree "other description":	Hospital utilisations (Monthly occupancy rates calculated using licensed bed and staffed bed counts, Mean patient bed days and Mean daily censuses) (hospital records). Number of employees reporting they are 'currently a cigarette smoker' (self-report).

	All property owned or leased.	Cessation support utilisation Mean employee resignations/terminations (hospital records). Mean employee new hires (hospital records).
Kvern 2006 [Canada -] **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree building(s) Smokefree doorways/entrances Smokefree grounds	Volume of nicotine patches and gum dispensed to in-patients (hospital records). Measured but no pre-comparator; excluded from review: *volume of requests from staff for smoking cessation medication costs reimbursements (data records).*
Ripley-Moffitt 2010 [USA +] **Interrupted time series**	Smokefree buildings Smokefree grounds *"100% tobacco-free hospital campus"*	Proportion of employee smokers by current quitting status (self-reported measure)
Smokefree Indoors Only		
Daughton 1992 [USA -] **Uncontrolled before-and-after study (with same sample after intervention)** ***(Post-sample is a sub-sample of the pre-sample*)**	Smokefree building(s) *A "total indoor smoking ban"*	Number of staff trying to quit smoking (self-reported). Mean number of cigarettes during work hours; during work days; during non-work days (self-reported measures). Measured but no pre-/post- comparator; excluded from review: *percentage of staff reporting decreased work productivity (self-reported): percentage of staff reporting changed eating locations to smoke (self-reported).*
Donchin 2004 [Israel +] **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree building(s)	Mean cigs/day smoked by staff (self-reported measure) Mean cigs/working hours smoked by staff (self-reported measure) Proportion of staff smokers by readiness to quit (based on self-reported answers to series of questions related to Prochaska's stages of change model)
Stillman 1990 [USA +] **Cohort study** ***Prospective descriptive study***	Smokefree building(s)	Rate of current smoking by employees (self-reported measure) Measured but no post-comparator; excluded from review: *employee quit rates (self-reported measure)*
Martínez 2008 [Spain +] **Interrupted time series** ***4 surveys between 2001-2006***	Smokefree "other description": *The Hospital became "entirely smoke-free" in 2005*	Rate of current smoking by employees (self-reported measure). Number of cigs/day smoked by employee smokers (self-reported measure). Proportion of employee smokers reporting at least one previous attempt to quit smoking (self-reported measure). Proportion of employee smokers expressing their readiness to plan to quit (self-reported measure).

Figure 3.2: Study descriptions for studies with supporting strategies and indicators of other consequences from adoption of smokefree: acute and maternity settings

Gadomski 2010 [USA +] uncontrolled before and after study (with same sample – staff; with different sample – patients)
This study investigates the effect of a local (hospital's) smokefree buildings and smokefree grounds policy on inpatient smoking rates, number of patients signing out against medical advice, and the extended effects of the ban on employee smoking rates. Assessments were conducted before and after implementation at a single time point with staff and multiple time points with patients. Supporting strategies included pharmacotherapies, cessation support, a campus map detailing smokefree borders, and staff, community and patient education.

Wheeler 2007 [USA -] uncontrolled before and after study
This study measured the impact of a local (university hospital board's) smokefree indoors and outdoors policy on employees and patients at 2 sites on a hospital campus. Pre ban assessments were conducted between 2003 and 2004; prior to full implementation at site one (a university hospital), and between the implementation of an employee only ban and full ban to also include patients and visitors at site 2 (a private children's hospital). Post ban assessments were conducted between August 2004 and October 2005. Supporting strategies included written policies, an implementation committee, posters, staff meetings, letters in staff payslips, patient appointments letters, cessation support, pharmacotherapies and announcements in local media.

Kvern 2006 [Canada -] uncontrolled before and after study (with different sample)
This study evaluated the processes used to implement a local (regional health authority's) smokefree grounds policy. Assessments were conducted at a single time point before and after the implementation of the policy. Supporting strategies included written policies, an implementation committee, signage, staff meetings, notices in staff payslips, cessation support, pharmacotherapies, temporary abstinence support for inpatients, moving of ashtrays and shelters to the site periphery, staff training, media campaigns, bilingual information sheets for patients and the public and information on health organisations' websites.

Hudzinski 1990 [USA +] uncontrolled before and after study (with same sample)
This study investigated the effects of tobacco smoke on employees and patients at a healthcare institution, the acceptance of a smokefree policy and the consequences of the policy for employees who were smokers. Assessments were conducted 6 months before, and at 6 and 12 months after the implementation of a local (medical foundation's) smokefree (campus) buildings and grounds policy. Supporting strategies included an implementation committee.

Donchin 2004 [Israel +] uncontrolled before and after study (with different sample)
This study was a process and outcome evaluation of implementation of a local (hospital board's) smokefree buildings policy using 2 successive random-sample surveys among hospital employees, assessing attitudes towards the policy, changes in employee smoking behaviour and short term impact on smoking in unauthorised areas. Assessments were conducted 3 months before and between 6 and 9 months after the policy was introduced. Supporting strategies included an implementation committee, cessation support, smoking shelters erected outside the hospital building, bans on the sale of tobacco products on site, an information campaign 2 months before the policy was introduced, a press conference launch and fines for violations.

Stillman 1990 [USA +] cohort study
This study evaluated a local (hospital board's) smokefree buildings policy in a large urban medical centre among employees at the hospital and school of medicine. Assessments were conducted

before and after implementation of the policy. Supporting strategies included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees.

Martinez 2008 [Spain +] interrupted time series
This study examined the extent of compliance with smoking restrictions among hospital employees where a smokefree policy was progressively introduced, to comply with national indoor smokefree legislation in Spain. Assessments were conducted annually for 6 years after policy implementation. Supporting strategies included the closure of smoking rooms and staff training.

Daughton 1992 [USA -] uncontrolled before and after study (with same sample)
This study examined the early and long term influence of a local (hospital's) smokefree buildings policy on smoking cessation rates, smoker behaviour and comfort in a hospital setting. Assessments were conducted at 5 and 17 months after policy implementation. Supporting strategies included an implementation committee, employee bulletins and newsletters, cessation support and an in-house media campaign.

Ripley-Moffitt 2010 [USA +] interrupted time series
This study examined the influence of a local (hospital's) smokefree (campus) buildings and grounds policy on smoking behaviour amongst employees. Assessments were conducted immediately prior to the implementation of smokefree and at 6 months and 1 year after. Supporting strategies included posters, staff meetings, an employee newsletter and cessation support.

3.2.1 Other Consequences from Smokefree for Patients (Acute & Maternity)

This section is organised into the following sub-headings: hospital utilisation and patient retention; and patient NRT prescriptions and NRT use.

3.2.1.1 Hospital Utilization and Patient Retention (Acute & Maternity)

Hospital Utilizations

Two uncontrolled before and after studies report outcomes relating to the impact of local policy implementation for smokefree buildings and grounds with supporting strategies on hospital utilizations in acute or maternity care settings (see study descriptions in Figure 3.2 and Table 2.2 above). Both showed no adverse change in effects from local-level smokefree policy implementation.

Gadomski's 2010 [USA +] uncontrolled before and after study (with different patient samples) observes that for the 18 months before implementation of a local (hospital's) smokefree buildings and smokefree grounds policy, there was an average of 959 inpatients admitted per month and for the 23 months post-ban, there was an average of 988 inpatients admitted per month. The authors state "*no adverse effects were observed on inpatient volume*" (no statistical analysis presented). Inpatients were screened for smoking status by the admitting nurse. The monthly average of admitted patients who smoke was approximately 21.6% following the ban. The authors note that "*There has been little variation in the percentage of inpatients who smoke pre-ban and post-ban except for the start-up period in 2006 and the onset of the 2007 respiratory illness season*", however precise data is not reported.

In **Wheeler's 2007 [USA -] uncontrolled before and after study** at Site 1 (a university hospital), the 12-month mean licensed bed occupancy increased slightly from 57.0% before implementation of a

local (university hospital board's) smokefree indoors and outdoors policy to 58.1% post-implementation, similarly the 12-month mean staffed bed occupancy increased slightly from 87.2% pre-implementation to 87.8% post-implementation. Over the measured 24 months, the mean monthly occupancy rate using staffed beds and licensed beds was 87.4% and 57.5%, respectively. Comparing the 12-month means before and after smokefree implementation, the mean monthly number of patient bed days at site 1 was 7,012, with a low of 6,649 occurring before policy implementation (Nov 03) and a high of 7,409 occurring after implementation (Jul 05) (no statistical analysis presented). The Mean Daily Census for the 12 months pre-implementation was 228.2 and for post-implementation was 232.6. Over the 24 months of the study period, the Mean Daily Census was 230.1, with the lowest census (218.9) and the highest census (244.4) both occurring prior to implementation (in Aug 03 and Feb 04 respectively) (no statistical analysis presented). At site 2 (a private children's hospital) in **Wheeler's 2007 [USA -]** study, comparisons of the 6-month averages before and after implementation local (university hospital board's) smokefree indoors and outdoors policy show that the licensed bed occupancy rate increased slightly after implementation (from 73.3% to 74.7%) and the staffed bed occupancy rate declined slightly after implementation (from 79.3% to 71.6%). (There was a concurrent increase in the number of staffed beds over this period due to hospital expansion activities.) The mean monthly occupancy rate using staffed beds was 74.4%, with the lowest being 69.4% in May 2005 (post-implementation) and the highest being 82.8% in June 2004 (pre-implementation). The equivalent mean monthly occupancy rate for licensed beds was 73.8%, the lowest being 70.4% in August 2004 (pre-implementation) and the highest being 76.8% in June 2005 (post-implementation). Comparisons of the 6-month averages before and after implementation of the campus-wide smoke-free policy at site 2 show that the mean patient bed days increased slightly after implementation (from 6298 to 6413). During that period, the mean monthly patient days at site two were 6,305, with a low of 5,766 in Feb 05 and a high of 6,590 in May 04, both pre-implementation. The overall Mean Daily Census was 206.7, with August 2004 having the lowest Mean Daily Census (197.1, pre-implementation) and June 2005 having the highest Mean Daily Census (215.3, post-implementation). Comparisons of the six-month averages before and after implementation of the campus-wide smoke-free policy at site two show that the Mean Daily Census increased slightly after implementation (from 205.4 to 209.2). Overall demand for hospital services increased after implementation as indicated by 2% in mean patient bed days and mean daily censuses (no statistical analysis presented).

Patients Signing Out Against Medical Advice

One uncontrolled before and after study reported outcomes relating to the impact of local policy implementation for smokefree buildings and grounds with supporting strategies on patients signing out against medical advice in acute or maternity care settings (see study descriptions in Figure 3.2 and Table 2.2 above). It showed no adverse change in effects from local-level smokefree policy implementation.

In **Gadomski 2010 [USA +]**, the proportion of inpatients signing out against medical advice giving the reason of 'having to smoke' varied little between 6 months pre- and 6 months post-implementation of a local (hospital's) smokefree buildings and smokefree grounds policy (13.8% pre ban, 13.6% post ban); dropping to 0% in 2007. Smoking amongst all inpatients signing out against medical advice increased from 48.3% 6 months pre ban, to 59% 6 months post ban and 50.8% 2007 (no statistical analysis presented).

Other Impacts on Patients: Hospital Utilization and Inpatient Retention (Acute & Maternity)

Evidence statement 2.1: There is **weak** evidence from two uncontrolled before and after studies in the USA **(Gadomski 2010 [+], Wheeler 2007 [-]**) about the impact of local policy implementation for smokefree buildings and grounds with supporting strategies on hospital inpatient admissions in an **acute and maternity setting**.

UK Applicability: This evidence was conducted outside the UK, however the policies include smokefree grounds and buildings (a policy implemented in parts of the UK), the papers were published in the last 5 years, and there is no reason to believe the effect on patients is not applicable to the UK setting.

(a) There is **weak** evidence from two uncontrolled before and after studies in the USA (**Gadomski 2010 [+], Wheeler 2007 [-]**) in an **acute and maternity setting** that local smokefree buildings and grounds policy implementation with supporting strategies does not adversely change the number or characteristics of inpatients admitted to hospital. **Gadomski 2010 [+]** in the USA observed no adverse effects on inpatient volume in the 18 months before implementation of the local (hospital's) smokefree buildings and smokefree grounds policy, and in the 23 months post-implementation and there was little variation in the proportion of inpatients who smoked before and after implementation. ***Supporting strategies*** *included pharmacotherapies, cessation support, a campus map detailing smokefree borders, and staff, community and patient education*. **Wheeler 2007 [-]** in the USA reported that the 12-month mean licensed bed occupancy and the 12-month mean staffed bed occupancy increased slightly from pre-to post-implementation of a local (university hospital board's) policy for smokefree indoors and outdoors with supporting strategies. ***Supporting strategies*** *included written policies, an implementation committee, posters, staff meetings, letters in staff payslips, patient appointments letters, cessation support, pharmacotherapies and announcements in local media*.

(b) There is **weak** evidence from one uncontrolled before and after study in the USA (**Gadomski 2010 [+]**) in an **acute and maternity setting** that implementation of a local (hospital's) smokefree buildings and smokefree grounds policy with supporting strategies does not change the number of inpatients signing out against medical advice (AMA) due to 'having to smoke' in the 6 months before and 6 months after implementation (no p values given). Smoking amongst all inpatients signing out AMA increased between 6 months pre-smokefree and 6 months post-smokefree but returned to the pre-smokefree baseline 1 year later (no statistical analysis presented). ***Supporting strategies*** *included pharmacotherapies, cessation support, a campus map detailing smokefree borders, and staff, community and patient education*.

3.2.1.2 Patient NRT Prescriptions and NRT Use (Acute & Maternity)

Two uncontrolled before and after studies report outcomes relating to the impact of local policy implementation for smokefree with supporting strategies (including pharmacotherapy provision) on patient prescriptions for NRT or patients' use of NRT in acute or maternity care settings (see study descriptions in Figure 3.2 and Table 2.2 above). Both showed an increase in effects from local-level smokefree policy or national smokefree legislation implementation.

In **Gadomski's 2010 [USA +] uncontrolled before and after study (with different patients sample)**, NRT prescriptions for inpatients increased from *n*=832 in the 2 years prior (April 1st 2004-March 31st 2006) to the implementation of a local (hospital's) smokefree buildings and smokefree grounds policy, to *n*=2,475 in the 2 years after the policy (April 1st 2006-March 31st 2008). In a time series

analysis of the NRT orders, there was a highly significant increase in prescriptions for inpatients between May and June 2006, 1 month prior to ban (p=0.008), with the linear rise continuing to climb more steeply in the following months. In **Kvern's 2006 [Canada -] uncontrolled before and after study (with different sample)**, evaluating a local (regional health authority's) smokefree grounds policy, from a pre-implementation utilisation level of zero for NRT support for inpatients, one hospital reported using just under *n*=150 NRT patches and a tertiary care facility reported using approximately *n*=550 NRT patches and *n*=650 pieces of NRT gum during the first 3 months of the policy.

Other Impacts on Patients: Inpatient NRT Prescriptions and NRT Use (Acute & Maternity)

Evidence statement 2.2: There is **weak** evidence from two uncontrolled before and after studies with different samples, one in the USA (**Gadomski 2010 [+])** and one in Canada (**Kvern 2006 [-]**), that **local smokefree policy implementation** with the supporting strategies of cessation support and pharmacotherapies/NRT provision increases the use of NRT by inpatients who smoke in an **acute or maternity care setting**.

UK Applicability: This evidence was conducted outside the UK, however the policies include smokefree grounds (a policy implemented in parts of the UK), and there is no reason to believe the effect on patients is not applicable to the UK setting.

Gadomski 2010 [+] in the USA reported that NRT prescriptions for inpatients increased in the 18 months before and 23 months after implementation of a local (hospital's) smokefree buildings and smokefree grounds policy, with a significant increase in prescriptions 1 month prior to implementation (p=0.008). ***Other supporting strategies*** *included cessation support, a campus map detailing smokefree borders, and staff, community and patient education*. **Kvern 2006 [-]** in Canada reported that NRT usage for inpatient support increased between before implementation of a local (regional health authority's) smokefree grounds policy and 3 months post-implementation. ***Other supporting strategies*** *included written policies, an implementation committee, signage, staff meetings, notices in staff payslips, cessation support, temporary abstinence support for inpatients, moving of ashtrays and shelters to the site periphery, staff training, media campaigns, bilingual information sheets for patients and the public and information on health organisations' websites*.

3.2.2 Other Consequences from Smokefree for Staff (Acute & Maternity)

This section is organised into the following sub-headings: staff smoking; staff quitting activity; staff readiness to quit; and employee resignations and hires.

3.2.2.1 Staff Smoking and Quitting Activity (Acute & Maternity)

Staff Smoking Rates

Three before and after studies, one cohort study and one interrupted time series report outcomes relating to the impact of local policy implementation for smokefree buildings and grounds and national legislation for smokefree implementation with supporting strategies on staff smoking in acute or maternity care settings (see study descriptions in Figure 3.2 and Table 2.2 above). All showed an increase in beneficial effects from local-level smokefree policy or national smokefree legislation implementation.

In an **uncontrolled before and after study (with same sample)**, **Hudzinski 1990 [USA +]** found that 6 months before and after a local (medical foundation's) smokefree (campus) buildings and grounds policy was implemented was implemented, 22% and 20% respectively, of hospital staff self-reported that they smoked, and this was reduced to 14% of hospital staff 12 months after the policy was implemented (Chi-square=11.53, p<0.003). In an **uncontrolled before and after study (with same staff sample), Gadomski 2010 [USA +]** reported that among a cohort of 489 staff, there was a 12% smoking prevalence in 2005, this decreased significantly to 7.5% in 2006 after implementation of a local (hospital's) smokefree buildings and smokefree grounds policy (p<0.001). Among all employees, smoking prevalence was 14.3% March-June 2005, 14.8% March-June 2006, decreasing significantly to 9.4% March-June 2007 (p<0.0002). **Wheeler 2007's [USA -] uncontrolled before and after study** finds that significantly fewer employees reported they were 'currently a cigarette smoker' after implementation of a local (university hospital board's) smokefree indoors and outdoors policy than before implementation (2.6% vs. 9.6%, p<0.0001). As the authors were concerned that the rates in the survey were biased by smokers who did not report their behaviours, they attempted to validate their results using other self-report surveys with that hospital's employees and found pre-implementation prevalence of 16.4%, and a further survey report post-implementation prevalence of 8% (no statistical analysis presented). **Stillman 1990's [USA +] cohort study** reports that during the year between surveys, the reported cross sectional smoking prevalence declined by 25%, from 21.7% 8 months pre- to 16.2% 6 months post-implementation of a local (hospital board's) smokefree buildings policy (p=0.0001).

Martinez 2008's [Spain +] interrupted time series around the implementation of national indoor smokefree legislation in Spain in 2005, found a non-significant decrease in employee smoking prevalence from 34.5% (95% CI: 27.7-41.2) in 2001 (before the complete ban) to 30.6% (95% CI: 24.7-36.4) in 2006 (after the complete ban). There were non-significant decreases in occupational sub-groups: smoking prevalence among doctors decreased from 20.0% in 2001 (95% CI: 6.7-33.2) before the complete ban implementation to 15.2% in 2006 (95% CI: 2.9-27.4), after the complete ban implementation (not significant); decreased among nurses, from 34.0% in 2001 (95% CI: 24.4-43.5) to 32.6% in 2006 (95% CI: 22.8-42.3) (not significant); decreased among administrative employees, from 56.0% in 2001 (95% CI: 36.5-75.4) to 37.0% in 2006 (95% CI: 18.7-55.2) (not significant); and remained the same among other employees at 35.3% in 2001 (95% CI: 19.1-51.2) and 35.7% in 2006 (95% CI: 21.2-50.2) (not significant).

Staff Smoking by Number of Cigarettes

Three before and after studies and one interrupted time series report outcomes relating to the impact of local policy implementation for smokefree and national legislation for smokefree with supporting strategies on the number of cigarettes smoked by staff in acute or maternity care settings (see study descriptions in Figure 3.2 and Table 2.2 above). All showed an increase in beneficial effects from local-level smokefree policy or national smokefree legislation implementation.

In **Donchin 2004's [Israel +] uncontrolled before and after study (with different sample)**, there was no appreciable change in the mean number of cigarettes smoked (in total or during work hours only) before and after implementation of a local (hospital board's) smokefree buildings policy. (Mean total cigarettes per day 13.6 (SD=10.4) (pre-), 12.9 (SD=10.4) (post-); mean cigarettes smoked during work hours 5.38 (SD=4.7) (pre-) 4.9 (SD=4.7) (post-), no further statistical analysis presented.) In an **uncontrolled before and after study (with same sample)** by **Daughton 1992 [USA -]**, 5 months after implementation and 17 months after implementation of a local (hospital's) smokefree buildings policy, there was a significant decrease in mean cigarette consumption during work hours by staff, from 7.3 cigarettes (SD=0.45) to 4.2 cigarettes (SD=0.26) (p<0.0001); during workdays, from 15.6 cigarettes (SD=0.83) to 12.7 cigarettes (SD=0.69), p<0.001; and during non-workdays, from 19.6

cigarettes (SD=0.92) to 18.6 cigarettes (SD= 0.89), p<0.01. This significant decrease in mean cigarette consumption mostly occurred amongst staff self-reported as moderate to heavy smokers (≥10 cigs/day) who reduced from 21.1 (SD=0.93) to 14.7 (SD=0.80) cigarettes, p<0.001. Light smokers (<10 cigs/day) day) showed only a slight decrease in mean daily cigarette consumption from 4.8 (SD=0.39) to 4.4 (SD=0.44) cigarettes, p<0.05. In a second **uncontrolled before and after study (with same sample)**, **Hudzinski 1990 [USA +]** 12 months after a local (medical foundation's) smokefree (campus) buildings and grounds policy was implemented, fewer cigarettes were smoked by staff in comparison to the previous year's data; after 12 months, 81% of smokers reported using <8 cigarettes per day (no other data reported). Approximately 1 in 4 staff smokers self-reported that they no longer smoked cigarettes during work hours 6 and 12 months after policy implementation. Approximately 40% of staff smokers self-reported that their cigarette consumption after work hours remained unchanged at both 6 and 12 months after policy implementation.

Martinez 2008's [Spain +] interrupted time series of annual assessments around the implementation of national indoor smokefree legislation in Spain in 2005, found that one year after the complete ban was implemented, in 2006 48.8% employees smoked <10 cigs/day (95% CI: 35.3-60.7), an increase from 30.8% in 2001 (95% CI: 24.8-51.19) (not significant). In 2001, 61.5% of employee smokers smoked 10-20 cigs/day (95% CI: 47.7-74.3), decreasing to 37.2% in 2006 (95% CI: 24.6-49.3), a year after complete ban implementation (not significant). Hospital employees smoking >20 cigs/day increased between 2001 (pre-implementation of the complete ban) and 2006 (post-implementation) from 7.7% (95% CI: 0.7-13.2) to 14.0% (95% CI: 5.1-22.8) (not significant).

Other Impacts on Staff: Staff Smoking (Acute & Maternity)

Evidence statement 2.3: There is evidence from five before and after studies, four in the USA **(Hudzinski 1990 [+], Gadomski 2010 [+], Wheeler 2007 [-], Daughton 1992 [+])**, and one in Israel **(Donchin 2004 [+])**, one cohort study in the USA (**Stillman 1990 [+]**) and one interrupted time series in Spain (**Martinez 2008 [+]**) about the impact of local-level policy and national legislation for smokefree implementation on staff smoking in an **acute and maternity setting**.

UK Applicability: This evidence was conducted outside the UK, however nearly half the studies test smokefree grounds and buildings (a policy implemented in parts of the UK); the others test indoor smokefree already national legislation in the UK. There is no reason to believe the effect on staff is not applicable to the UK setting.

(a) Staff Smoking Rates: There is **moderate** evidence from three before and after studies in the USA (**Hudzinski 1990 [+], Gadomski 2010 [+], Wheeler 2007 [-]**), one cohort study in the USA (**Stillman 1990 [+]**) and one interrupted time series in Spain (**Martinez 2008 [+]**) to suggest that local-level policy and national legislation for smokefree implementation with supporting strategies **decreases** smoking rates amongst staff in an **acute and maternity setting**.

Hudzinski 1990 [+] in the USA reported that the proportion of hospital staff who self-reported that they smoked significantly decreased from 6 months pre- to 6 months post-implementation of a local (medical foundation's) smokefree (campus) buildings and grounds policy (Chi-square=11.53, p<0.003). ***Supporting strategies*** *included a Smoke-Free Task Force (with clinicians, psychologists, and administrative personnel from public affairs and employee relations departments)*. **Gadomski 2010 [+]** in the USA reported a decrease in employee smoking prevalence from 1 year pre- to 1 year post-implementation of a local (hospital's) smokefree buildings and smokefree grounds policy (p<0.001). ***Supporting strategies*** *included pharmacotherapies, cessation support, a campus map detailing smokefree borders, and staff, community and patient education*. **Wheeler 2007 [-]** in the

USA reported significantly fewer employees reporting that they were a current smoker 10 months after the implementation of a local (university hospital board's) policy for smokefree indoors and outdoors than 3 months before implementation (p<0.0001). ***Supporting strategies*** *included written policies, an implementation committee, posters, staff meetings, letters in staff payslips, patient appointments letters, cessation support, pharmacotherapies and announcements in local media*. **Stillman 1990 [+]** in the USA reported a significant decline in staff smoking prevalence from 8 months pre- to 6 months post-implementation of a local (hospital board's) smokefree buildings policy (p=0.0001). ***Supporting strategies*** *included written policies, an implementation committee, cessation support, an internal media and educational campaign and free health checks for employees*. Following implementation of national indoor smokefree legislation in Spain in 2005, **Martinez 2008 [+]** in Spain found a non-significant decrease in employee smoking prevalence from 4 years before the smokefree legislation (95% CI: 27.7-41.2) to 1 year after the legislation (95% CI: 24.7-36.4). ***Supporting strategies*** *included the closure of smoking rooms and staff training*.

(b) Staff Smoking by Number of Cigarettes: There is **moderate** evidence from three before and after studies, one in the USA (**Hudzinski 1990 [USA +], Daughton 1992 [-]**) and one in Israel (**Donchin 2004 [+]**), and one interrupted time series in Spain (**Martinez 2008 [+]**) to suggest that local-level policy and national legislation for smokefree implementation with supporting strategies **decreases** the number of cigarettes smoked by staff both during working hours and overall in an **acute and maternity setting**. **Hudzinski 1990 [+]** in the USA reported a decrease in the number of cigarettes staff reported smoking from 6 months pre- to 6 months post-implementation of a local (medical foundation's) smokefree (campus) buildings and grounds policy (data not reported). ***Supporting strategies*** *included a Smoke-Free Task Force (with clinicians, psychologists, and administrative personnel from public affairs and employee relations departments)*. **Donchin 2004 [+]** in Israel reported no change in the mean number of cigarettes smoked, either in during work hours or in total following the implementation of a local (hospital board's) smokefree buildings policy, measured 3 months before and 6-9 months after implementation. ***Supporting strategies*** *included an implementation committee, cessation support, smoking shelters erected outside the hospital building, bans on the sale of tobacco products on site, an information campaign 2 months before the policy was introduced, a press conference launch and fines for violations*. Following implementation of a local (hospital's) smokefree buildings policy, **Daughton 1992 [-]** in the USA reported a significant decrease in mean cigarette consumption during work hours (p<0.0001), during workdays (p<0.001) and during non-workdays (p<0.01) by staff between 5 months and 17 months post-implementation. The significant decrease in mean cigarette consumption mostly occurred amongst staff self-reported as moderate to heavy smokers (≥10 cigs/day) (p<0.001); Light smokers (<10 cigs/day) day) showed only a slight decrease in mean daily cigarette consumption (p<0.05). ***Supporting strategies*** *included an implementation committee, employee bulletins and newsletters, cessation support and an in-house media campaign*. After the implementation of national indoor smokefree legislation in Spain in 2005, **Martinez 2008 [+]** in Spain reported a non-significant increase in the number of employees self-reporting they smoked <10 cigs/day after the implementation 1 year after the legislation (95% CI: 35.3-60.7) compared with 4 years before (95% CI: 24.8-51.19). There was a non-significant decrease in the number of employees who smoked 10-20 cigs/day and a non-significant increase in those who smoked >20 cigs/day 1 year after the legislation (95% CI: 24.6-49.3 and 95% CI: 5.1-22.8 respectively) compared with 4 years before (95% CI: 47.7-74.3 and 95% CI: 0.7-13.2 respectively). ***Supporting strategies*** *included the closure of smoking rooms and staff training*.

Staff Quitting Activity

Two before and after studies and two interrupted time series report outcomes relating to the impact of local policy implementation for smokefree and national legislation for smokefree with supporting strategies on staff quitting activity in acute or maternity care settings (see study descriptions in

Figure 3.2 and Table 2.2 above). There were inconsistent results showing no change or a decrease in beneficial effects from local-level smokefree policy or national smokefree legislation implementation.

In an **uncontrolled before and after study (with same sample)** by **Daughton 1992 [USA -]**, 5 months after the implementation of a local (hospital's) smokefree buildings policy, 39% of the surveyed staff smokers (n=79) self-reported trying to quit: 22 enrolled in a stop-smoking program and 57 used a non-program approach. Of those enrolled in a smoking program, 32% (n=7) reported abstinence ≥6 months and of those using a non-program approach, 16% (n=9) reported being smokefree ≥3 months. Of the 284 ex-smokers sampled, 7% (n=20) had stopped smoking in the year pre-ban, which was only slightly lower than the 8% quit rate (16 of 203) achieved during the ban year (non-significant). Seventeen months after implementation of a total indoor ban on smoking at the hospital, 41% staff smokers (n=36) self-reported trying to quit during the second year of the ban. Two years after the policy was announced, 8% staff smokers (n=7) were reportedly smoke-free for ≥3 months (a similar rate to both pre-ban and ban-year institutional quit rates). In an **uncontrolled before and after study (with same sample)**, **Hudzinski 1990 [USA +]** report that 6 months before a local (medical foundation's) smokefree (campus) buildings and grounds policy was implemented, 28% of staff smokers reported that they intended to stop smoking if the institution implemented a policy; 12 months post-Implementation, "most who expressed that interest had attempted to do so" (no data given). Twenty-five percent and 21% of staff smokers reported that they tried to stop smoking at 6 and 12 months post-implementation respectively.

Martinez 2008's [Spain +] interrupted time series around the implementation of national indoor smokefree legislation in Spain in 2005, found a non-significant decrease in the proportion of hospital employee smokers reporting having attempted to quit smoking at least once decreased from 64.6% in 2001 (95% CI: 52.0-76.0), before the implementation of a complete ban, to 42.4% in 2006 (95% CI: 29.8-55.0), 1 year after the implementation of a complete ban.

Ripley-Moffitt's 2010 [USA +] interrupted time series, was conducted 1 month prior to the implementation of a local (hospital's) smokefree (campus) buildings and grounds policy and at 6 months and 12 months post-implementation. At 1 month before implementation, 31 participants (15%) reported that they had quit smoking in the previous 6 months pre-implementation. Of the 179 current smokers, 45% reported a quit attempt within the previous 6 months. Six months after the policy took effect, 33 participants (15.7%) reported not smoking; this included 16 who reported quitting more than 6 months previously, plus 17 who reported quitting during the intervening 6 months. Among the 133 participants who reported currently smoking, 53% reported quit attempts in the intervening 6 months (no statistical analysis presented). Among the 117 who reported current smoking at the 12-month survey, 48% reported attempts to quit smoking in the preceding 6 months. At each survey, approximately 60% of employees who currently smoked reported plans to quit smoking in the next 30 days or 6 months (no statistical analysis presented). The majority of employees who had self-reported either not smoking or making quit attempts stated that the smokefree (campus) buildings and grounds policy had some influence on their behaviour. Over a third (39%) of those not smoking reported a strong influence of the policy at baseline, and 36% indicated a strong influence at 6- and 12-month follow ups. Those who smoked also reported a strong influence of the policy on their quit attempts (20% at baseline, and 24% and 20% at follow-up surveys).

Other Impacts on Staff: Staff Quitting Activity (Acute & Maternity)

Evidence statement 2.4: There is **inconsistent** evidence from two before and after studies from the USA **(Daughton 1992 [-], Hudzinski 1990 [+])**, and two interrupted time series, one from Spain (**Martinez 2008 [+])** and one from the USA (**Ripley-Moffitt 2010 [+])**, about the impact of local-level policy and national legislation for smokefree implementation with supporting strategies on staff quit attempts in an **acute and maternity setting**.

UK Applicability: This evidence was conducted outside the UK and the policy covered in three studies (indoor smokefree) is already national legislation in the UK, however the other study's policy is for smokefree grounds and buildings (a policy implemented in parts of the UK). There is no reason to believe the effect on staff is not applicable to the UK setting.

(a) Quit attempts: There is **inconsistent** evidence from two before and after studies from the USA (**Daughton 1992 [-], Hudzinski 1990 [+]**) and two interrupted time series, one in Spain (**Martinez 2008 [+]** and one in the USA (**Ripley-Moffitt 2010 [+]**), to suggest that smokefree implementation with supporting strategies decreases or has no effect on the number of quit attempts by staff.

Three studies found no change or a decrease post-implementation. **Hudzinski 1990 [+]** in the USA reported that the proportion of hospital staff smokers who reported that they intended to stop smoking if the institution implemented a policy was slightly higher than the proportion that staff who reported that they tried to stop smoking at six and 12 months post-implementation a local (medical foundation's) smokefree (campus) buildings and grounds policy. ***Supporting strategies*** *included a Smoke-Free Task Force (with clinicians, psychologists, and administrative personnel from public affairs and employee relations departments)*. Following implementation of a local (hospital's) smokefree buildings policy, **Daughton 1992 [-]** in the USA reported **no change** in the rate of staff smokers self-reporting trying to quit (around two-fifths) between 5 months and 17 months post-implementation. ***Supporting strategies*** *included an implementation committee, employee bulletins and newsletters, cessation support and an in-house media campaign*. Following implementation of national indoor smokefree legislation in Spain in 2005, **Martinez 2008 [+]** in Spain reported a non-significant decrease the proportion of hospital employee smokers reporting having attempted to quit smoking at least once from 4 years before the smokefree legislation (95% 95% CI: 52.0-76.0) to 1 year after the legislation (95% CI: 29.8-55.0). ***Supporting strategies*** *included the closure of smoking rooms and staff training*.

One study found an increase post-implementation. **Ripley-Moffitt 2010 [+]** in the USA reported an increase in current smokers self-reporting to have made a quit attempt in the preceding 6 months from the month pre-implementation of a local (hospital's) smokefree (campus) buildings and grounds policy to 6 months post-implementation, the proportion falling at 12 months post-implementation but still a higher than before smokefree was in place. There was no change in the proportion of employees who currently smoked who reported plans to quit smoking in the next 30 days or 6 months across all three surveys; it was always higher than the proportion who made quit attempts. ***Supporting strategies*** *included posters, staff meetings, an employee newsletter and cessation support.*

(b) Successful quitting: There is **weak** evidence from one before and after study in the USA (**Daughton 1992 [-]**) and one interrupted time series in the USA (**Ripley-Moffit 2010 [+]**) to suggest that implementation of a local smokefree policy for buildings or buildings and grounds with supporting strategies does not change the proportion of staff who quit smoking. **Daughton 1992 [-]** in the USA found a similar quit rate for staff who remain smoke-free for ≥3 months in the year pre-policy, at 5 months post-policy and at 7 months post-policy. ***Supporting strategies*** *included an*

implementation committee, employee bulletins and newsletters, cessation support and an in-house media campaign. **Ripley-Moffitt 2010 [+]** in the USA reported no change in the proportion of staff reporting that they had quit smoking in the previous 6 months at the month pre-implementation of a local (hospital's) smokefree (campus) buildings and grounds policy to those reporting at 6 months post-implementation. ***Supporting strategies*** *included posters, staff meetings, an employee newsletter and cessation support.*

Staff Readiness to Quit

One before and after study and one interrupted time series report outcomes relating to the impact of local policy implementation for smokefree and national legislation for smokefree with supporting strategies on staff readiness to quit[10] in acute or maternity care settings (see study descriptions in Figure 3.2 and Table 2.2 above). There were inconsistent results showing some increases and decreases in beneficial effects from local-level smokefree policy or national smokefree legislation implementation.

In **Donchin 2004's [Israel +] uncontrolled before and after study (with different sample)**, the majority of staff smokers in both surveys, one pre- and one post- implementation of a local (hospital board's) smokefree buildings policy, were classified in the pre-contemplation stage (49.2% pre- and 57.4% post-policy); few were classified in the preparatory stage (12.7% pre- and 8.2% post-policy). The distribution by stages of change was not associated with age, gender, education or occupation, or with degree of compliance to the new policy (no further statistical analysis presented). **Martinez 2008's [Spain +] interrupted time series** around the implementation of national indoor smokefree legislation in Spain in 2005, found a significant increase in hospital employee smokers expressing readiness to quit increased significantly from 40.3% in 2001 (95% CI: 28.4-52.2), in 2001 (before the complete ban) to 58.6% in 2006 (95% CI: 55.4-61.8), in 2006 (after the complete ban) ($p<0.05$).

Other Impacts on Staff: Staff Readiness to Quit (Acute & Maternity)

Evidence statement 2.5: There is **inconsistent** evidence from one before and after study in Israel (**Donchin 2004 [+]**) and one interrupted time series in Spain (**Martinez 2008 [+]**) that that smokefree implementation with supporting strategies may increase the number of staff smokers' readiness to quit in an acute or maternity care setting.

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the strategy's effect is not applicable to the UK setting.

Martinez 2008 [+] in Spain found a significant increase in hospital employee smokers expressing readiness to quit after the implementation of national indoor smokefree legislation in Spain in 2005 compared with before ($p<0.05$). ***Supporting strategies*** *included the closure of smoking rooms and staff training*. Whereas **Donchin 2004 [+]** in Israel reported an increase in staff smokers classified in the pre-contemplation stage, and a smaller decrease in those classified in the preparatory stage, following the implementation of a local (hospital board's) smokefree buildings policy, measured 3 months before and 6-9 months after implementation, indicating less readiness to quit. ***Supporting strategies*** *included an implementation committee, cessation support, smoking shelters erected outside the hospital building, bans on the sale of tobacco products on site, an information campaign 2 months before the policy was introduced, a press conference launch and fines for violations*. The evidence from **Donchin 2004 [+] in Israel** could be due to those who were most motivated to quit

[10] Prochaska JO, DiClemente CC, Velicer WF, Rossi JS (1993). Standardized, individualized, interactive, and personalized self-help programs for smoking cessation. *Health Psychology*, 12(5): 399-405.

doing so as a result of smokefree, leaving the least motivated group; alternatively smokefree had an effect that made staff smokers less likely to want to quit.

3.2.2.2 Other Impacts on Staff (Acute & Maternity)

Employee Resignations and Hires

One uncontrolled before and after study reports outcomes relating to the impact of local policy implementation for smokefree indoors and outdoors with supporting strategies on employee resignations and hires in acute or maternity care settings (see study descriptions in Figure 3.2 and Table 2.2 above). The study showed no adverse change in effects from local-level smokefree policy implementation.

One **uncontrolled before and after study** (**Wheeler 2007 [USA -]**) reports no discernible changes in mean employee resignations/terminations after implementation of the local (university hospital board's) policy for smokefree indoors and outdoors at either site. At site 1, the mean resignations/terminations rate for the 6 month period pre- implementation was 6.14% of all active employees, this decreased slightly to 6.05% for the 6 month period post-implementation. There were no discernible changes in rate of new employee hires after implementation of the campus smoking ban at either site. More employees stated that they were likely to stay as a result of the policy (more than 30% in both years) or were unaffected by the policy (60% or greater in both years) than those who said they were likely to leave because of the policy (less than 5% in both years). Researchers were "*concerned that underrepresentation of smokers, who may have chosen not to return the survey, might have influenced results*" and reweighted the data (more weight to smokers to bring the prevalence in April 2004 (2 months pre-implementation) and May 2005 up to 15% and reduced weights to non-smokers). On reanalysis of the 'likelihood to leave as a result of the new policy' variable, percentages changed proportionally in both years, but only by 2-3% without any effect on significance testing. No further statistical analysis presented.

Other Impacts on Staff: Employee Resignations and Hires (Acute & Maternity)

Evidence statement 2.6: There is **weak** evidence from one uncontrolled before and after study in the USA (**Wheeler 2007 [-]**) that implementation of a local (university hospital board's) policy for smokefree indoors and outdoors with **extensive** supporting strategies does not change the mean number of the number of employee resignations/terminations, the likelihood of employees leaving as a result of the policy, or the rate of new employee hired in an acute or maternity care setting.

UK Applicability: This evidence was conducted outside the UK, however the policy covers smokefree grounds and buildings (a policy implemented in parts of the UK) and there is no reason to believe the effect is not applicable to the UK setting.

Wheeler 2007 [-] in the USA found no discernible changes in mean employee resignations/terminations or new employee hires after implementation of a local (university hospital board's) policy for smokefree indoors and outdoors. More employees stated that they were likely to stay as a result of the policy or were unaffected by the policy than those who said they were likely to leave because of the policy. ***Supporting strategies*** *included written policies, an implementation committee, posters, staff meetings, letters in staff payslips, patient appointments letters, cessation support, pharmacotherapies and announcements in local media*.

3.3 Q3: Are There Any Unintended Consequences from Adopting Smokefree Approaches in Mental Healthcare Settings?

Fifteen studies were identified and included in the review which addressed this question. The outcomes measures of effects of smokefree implementation for each study are presented in Table 3.3 and the studies are summarised in full detail in the evidence tables in Appendix 7.

This section covers studies conducted in secondary care mental healthcare settings, and is organised into the following two measured outcome sub-headings: other consequences from smokefree for patients; and other consequences from smokefree for staff. The findings from the studies are presented (studies are annotated with the country and internal validity score in parentheses following the citation).

Table 3.3: Outcome measures of other consequences from smokefree by type of ban & study

Title **Study design**	**Type of ban**	**Outcomes measured: other consequences from smokefree implementation**
Smokefree Grounds		
Kempf 1996 **[USA +]** **Randomised controlled trial**	**Intervention campus (18 month therapeutic community model):** Smokefree building(s) Smokefree doorways/entrances Smokefree grounds **Control campus (6 month chemical dependency model):** Smokefree building(s) *Designated outdoor areas for smoking*	Recruitment into treatment programme (declined admission to the tobacco-free programme) (records data). Programme retention rates at 2 days and 2 weeks (records data).
Hempel 2002 **[USA +]** **Uncontrolled before-and-after study (with same sample after intervention)**	Smokefree building(s) Smokefree "other description": *States "on hospital property"*	Verbal aggression incidents: behaviour viewed by staff as hostile or threatening and directed towards a person or object without the application of physical force (patient's chart data). Physical aggression incidents: behaviour viewed by staff as hostile or threatening toward a person or object with the application of physical force. (patient's chart data). Instances of PRN medication for agitation (irritability or restlessness) (patient's chart data). Instances of PRN medication for verbal or physical aggression (patient's chart data). Instances of restraint (physical or chemical) and seclusion (quiet room under observation) (patient's chart data).

		Instances of sick call (visit of patient to medical doctor for a physical complaint) (patient's chart data).
Quinn 2000 **[USA -]** **Uncontrolled before-and-after study (with same sample after intervention)**	Smokefree "other description": *"Tobacco could not be used on any part of the hospital campus" (applied to patients, staff and visitors)*	Rate of verbal acts of aggression per month (chart data). Rate of physical acts of aggression per month (chart data).
Shetty 2010 **[UK +]** **Uncontrolled before-and-after study (with same sample after intervention)**	Smokefree building(s) Smokefree grounds Smokefree "other description": *All in-patients in medium secure units were required to abstain from tobacco (unenforceable for small number with unescorted community leave)* Ban exclusions: *If the clinical team agreed there was a clinical reason not to enforce abstinence (in practice, none) or for the small number of patients who had unescorted community leave*.	Incidents of smoking-related verbal aggression (from chart data and hospital records) Incidents of smoking-related physical aggression (from chart data and hospital records) PRN tranquillising medication levels (from chart data and hospital records) Clozapine serum levels (from chart data and hospital records) Use of NRT (from chart data and hospital records) Measured but no pre- comparator; excluded from review: p*atients' smoking cessation course attendance*
Cormac 2010 **[UK +]** **Uncontrolled before-and-after study (with different sample after intervention)** *Pre- and post-ban responses not linked but most sample the same (n=298 patients for study duration)*	Smokefree building(s) Smokefree grounds	Rate of violent incidents by patient (including self-harm (threats or actual), verbal abuse (or aggression or threats), physical aggression (attempted or actual), damage to property) (patient's chart data). Rate of patient episodes of seclusion due to threatening behaviour, attacks on staff, attacks on fellow patients (patient's chart data). Average daily dose of 4 classes of psychotropic medication: regular antipsychotics, regular benzodiazepines, PRN antipsychotics, PRN benzodiazepines (patient's chart data). Number of patients receiving NRT (patient's chart data).
Haller 1996 **[USA +]** **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree building(s) Smokefree grounds	Proportion of 8 hours shifts with and without aggressive behaviour: physical aggression against other people Proportion of 8 hours shifts with and without aggressive behaviour: physical aggression against objects Proportion of 8 hours shifts with and without

		aggressive behaviour: physical aggression against self Proportion of 8 hours shifts with and without aggressive behaviour: verbal aggression Proportion of patients secluded Proportion of patients restrained Proportion of patients received p.r.n. medication Proportion of patients discharged against medical advice Proportion of patients eloped
Patten 1995 **[USA +]** **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree building(s) Smokefree grounds Ban exclusions: *Patients with off-unit privileges, at an appropriate level, were granted brief passes to leave the building unaccompanied to smoke ("very few patients")*	Rate of patients in seclusion (data from patient charts) Rate of use of restraints for patients (data from patient charts) Total PRN medication use (data from patient charts) Proportion of patient days with PRN medication (data from patient charts) Number of patients who left against medical advice (data from patient charts) Patients' smoking status (self-reported) Number of patient consultations to the Nicotine Dependence Center (unit records) Number of recorded patient complaint investigations related to right to smoke (unit records) Measured but no pre- comparator; excluded from review: *patient use of cessation support during hospitalisation; and patient use of cessation support following hospital discharge (self-reported).*
Smokefree Indoors Only		
Erwin 1991 **[USA -]** **Interrupted time series**	Smokefree "other description": *Smokefree acute psychiatric wards (presume from the paper's introduction, the rest of hospital is smokefree)*	Frequency of nursing staff reporting they intervened verbally or physically to prevent a patient who demanded to smoke from harming self or others (self-report measure). Frequency of nursing staff reporting they encouraged room "time outs" to decrease stimulation (self-report measure). Frequency of nursing staff reporting they offered medications as needed (p.r.n. medications) (self-report measure). Frequency of nursing staff reporting they encouraged patients to participate in smoking cessation groups (self-report measure).
Etter 2008 **[Switzerland +]** **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree building(s) *Patients (except those in locked rooms) and staff were allowed to leave the unit to smoke outside*	Smoking behaviour of patients who smoke (self-report measures: mean cigs/day, now; mean cigs/day, before admission; smoke more/less/same since admission) Frequency of use of smoking cessation by patients who smoke Measured but no pre- comparator; excluded from

(The staff sample consisted of largely the same people who answered successive surveys, although results not linked)		review: *provision of smoking cessation interventions for patients by staff*
Joseph 1993 **[USA +]** **Cohort study**	Smokefree building(s)	Patient smoking/quitting status (self reported measure). Patient smoking habits at time of interview compared with at hospital admission (less, the same, more) (self reported measure).
Matthews 2005 **[USA -]** **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree "other description": *Described as "smoking ban"*	Number of patients who committed at least one episode of assault or self-harm (clinical data). Number of episodes of assault or self-harm (clinical data). Number of patients who required seclusion or restraint (clinical data). Number of episodes of seclusion or restraint (clinical data). Number of callouts (i.e., scheduled staff not coming in for their shift, absenteeism) (HR records).
Rees 2008 **[USA +]** **Uncontrolled before-and-after study (with different sample after intervention)**	Smokefree "other description": *Ban on tobacco and discontinuation of patient smoke breaks.*	Rates of patients leaving the unit against medical advice (records). Rates of patient transfers to other inpatient facilities (records). Number of programme admissions (records). Average length of patient stay (records). Rates of seizure among patients (records).
Rauter 1997 **[USA +]** **Cohort study**	Smokefree building(s) Other: *Designated open-air smoking areas established outside the buildings*	Number of assault rates involving a patient (incident reports). Number of smoking-related assault rates involving a patient (incident reports). Average monthly patient acuity level (from one, most acute, to five, ready for discharge) (recorded daily by nurses). Recorded patient complaint investigations related to smoking & perceived rights violations (incident reports).
Sterling 1994 **[USA -]** **Cohort study**	Smokefree building(s)	Proportion of 'premature terminators' (drop-outs) from program (program records). Average number of outpatients attending groups (program records). Average number of daily new admissions per week (program records).
Velasco 1996 **[USA -]** **Cohort study**	Smokefree "other description": *Prohibited cigarette smoking of inpatients.*	Number of verbal assaults (openly expressed anger such as threats, personal insults, or other derogatory remarks directed at other patients or staff) per shift (records).

		Number of physical assaults per shift (records). Number of applications of patient seclusion per shift (records). Number of applications of leather restraints (wrist or ankle bindings) per shift (records). Number of applications of soft restraints (cloth devices e.g. poesy vest) per shift (records). Number of security calls (for help from security officers) per shift (records). Number of administrations of PRN medication for anxiety per day (records). Number of discharges against medical advice each day (records). Number of patients who received nicotine gum or transdermal nicotine per day (records).

Figure 3.3: Study descriptions for studies with supporting strategies and indicators of other consequences from adoption of smokefree: mental healthcare settings

Erwin 1991 [USA -] interrupted time series
This study presents the reactions of 29 nursing staff members on two inpatient psychiatric wards at a veterans affairs hospital who experienced the transition to smoke-free status with the introduction of a local (US Department of Veterans Affairs) smokefree buildings policy. Assessments were conducted before implementation, and at 1 week and 4 weeks following implementation. Outcomes relevant to this review were only reported for two post-implementation time points. Nursing interventions included encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke to support the strategy.

Hempel 2002 [USA +] uncontrolled before and after study (with same sample)
This study investigated the effects of a total smoking ban via a local (hospital board's) smokefree (campus) buildings and smokefree grounds policy on the behaviour of 140 forensic patients in a maximum security psychiatric hospital. Assessments were conducted 4 weeks prior to, and 4 weeks after implementation. Staff were provided with education about potential withdrawal symptoms, and any tobacco products found on patients were seized. Patient charts were reviewed for records of 'disruptive behaviours' including verbal or physical aggression towards a person or object and loss of privileges as a result of disruptive behaviours.

Quinn 2000 [USA -] uncontrolled before and after study (with same sample)
This study investigated rates of verbal and physical aggression amongst inpatients, and compared the number of incidents before (November 1998) and after (January 1999) the implementation of a local (hospital's) smokefree (campus) buildings and smokefree grounds policy. Written policies supported the strategy, and pharmacotherapy and cessation support education about smoking and tobacco addiction recovery were provided.

Shetty 2010 [UK +] uncontrolled before and after study (with same sample)
This study retrospectively evaluates changes in behaviour, incidents and medication requirements of 56 patients in a medium secure male hospital smokefree due to national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy. Assessments were conducted 3 months prior to the implementation of policy and at three and 12 months post implementation. The strategy was supported by posters/signage, group and individual cessation support, pharmacotherapies, closure of smoking rooms and staff training.

Cormac 2010 [UK +] uncontrolled before and after study (with different sample)
This study evaluates the impact of a total smoking ban, due to national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy, on 298 patients in buildings and grounds of a high secure psychiatric hospital. Assessments were conducted prior to implementation in December 2006 and March 2007, and post implementation in April and July 2007. The strategy was supported by pharmacotherapy, cessation support, staff training and patient surrender of smoking materials.

Haller 1996 [USA +] uncontrolled before and after study (with different sample)
This study investigates the effect of a complete smoking ban via a local (hospital's) smokefree buildings and smokefree grounds policy on patient or ward disruption on a 16 bed locked psychiatric unit. Patient charts were assessed 1 month prior to implementation (n=26), and at 1, 2, 3 and 4 months post implementation (n=135). The strategy was supported by pharmacotherapies, staff education to recognise and treat nicotine withdrawal and written information for patients.

Matthews 2005 [USA -] uncontrolled before and after study (with different sample)
This study aimed to evaluate the implementation of a local (hospital's) smokefree buildings policy on an acute crisis stabilization (psychiatric) unit for men. Assessments were conducted with 14 staff 3 months prior to implementation and 13 staff 3 months post-implementation. The strategy was supported by patient education about nicotine addiction and withdrawal and pharmacotherapies.

Rauter 1997 [USA +] cohort study
This study described the effects of a local (hospital's) smokefree buildings policy (introduced on January 1st 1991) in a major 145-bed psychiatric hospital, focussing on assault rates and other indicators. Assessments were made twice pre implementation at 15 months (Oct '89-Mar '90) and 3 months (Oct '90-Dec '90), immediately after implementation (Jan '91-Mar '91) and 1 year post implementation (Jan '92-Jun '92). Patients wishing to participate in smoking reduction workshops were urged to do so, but no other supporting strategies for the policy were reported.

Velasco 1996 [USA -] cohort study
This study examines the effect of a local (hospital's) smokefree buildings policy on the behaviour of patients on a 25 bed locked psychiatric inpatient unit. Assessments of daily recorded data were made over a 6 week period immediately before and over a 6 week period immediately after the implementation of the smoking ban on October 1st 1991, and again 2 years later in 1993. Patients were notified of the ban prior to admission in support of the policy.

Patten 1995 [USA +] uncontrolled before and after study (with different sample)
This study evaluates the effect of a local (hospital board's) smokefree buildings and smokefree grounds policy on the behaviour of inpatients. Hospital chart data were examined for the 3 months prior to implementation and the 3 months post implementation. The strategy was supported by an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence.

Rees 2008 [USA +] uncontrolled before and after study
This study examined whether a local (university hospital's) smokefree buildings policy in its inpatient medical detoxification unit would deter patients. Assessment of patient records was carried out for the 12 month period before (n=516) and after (n=561) the ban. Patients were informed of the smoking ban as part of their admission screening process but no other strategies to support the policy was reported.

Sterling 1994 [USA -] cohort study
This study examined the impact of adopting a local (facility's) smokefree buildings policy on admissions and attendance on 204 admissions to a cocaine treatment programme offering outpatient group therapy sessions for 3 half days per week. Assessments were conducted at 1 and 3 months pre and post implementation. Outpatients were informed of the ban by a therapist and posters were displayed to support the strategy.

Kempf 1996 [USA +] randomised controlled trial
This study assesses the effect of a local (facility's) smokefree campus policy on adolescent patient intake and retention in a 350-bed residential substance abuse treatment facility. One hundred and fifty five adolescents admitted had smoking data available, 105 of which were allocated to the tobacco-free programme (smokefree indoors and outdoors), 50 to the other programme (smoking permitted in designated outdoor areas). No strategies to support the policy were reported.

Etter 2008 [Switzerland +] uncontrolled before and after study (with different sample)
This study compares the acceptability and efficacy of a partial and total smoking ban (via the local (hospital administration's) smokefree buildings policy) amongst 240 patients and staff in an inpatient psychiatric hospital. Assessments were conducted prior to implementation, 2 months post partial implementation, 20 months post partial implementation/pre total implementation and 3 to 5 months post total implementation of the smokefree buildings policy. The strategy was supported by posters and/or signage, cessation support, pharmacotherapies, closure of smoking rooms and staff training.

Joseph 1993 [USA +] cohort study
This study investigated the potential impact of local (facility's) smokefree buildings policy and smoking interventions on the results of treatment for drug and alcohol use among 314 male inpatients. Assessments were made before implementation with one patient cohort's (admitted during January-May 1998) chart data retrospectively reviewed and interviewed 14-21 months after discharge; and after implementation with a second patient cohort's (July-December 1988) chart data retrospectively reviewed and interviewed 8-19 months after discharge. Inpatients in the smokefree cohort were informed of the policy and cessation programme prior to admission, and were required to agree in writing to nicotine abstinence during the treatment but no other supporting strategies are reported.

3.3.1 Other Consequences from Smokefree for Patients (Mental Healthcare)

This section is organised into the following sub-headings: violent incidents/aggression; seclusion and restraint; security calls for help; medication changes; disruptive behaviours; admittance and length of stay; complaint investigations; smoking and quitting behaviours; and other health impacts on patients.

3.3.1.1 Violent Incidents/Aggression (Mental Healthcare)

Six uncontrolled before and after, two cohort studies and one interrupted time series(report outcomes relating to the impact of local policy or national legislation for implementation of smokefree buildings and/or grounds with supporting strategies on violent incidents and aggression in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). There were inconsistent results showing no change, a decrease or an increase in beneficial effects from local-level smokefree policy or national smokefree legislation implementation.

In **Erwin's 1991 [USA -]** interrupted time series, there was a decline in the proportion of nursing staff reporting that they intervened verbally or physically to prevent a patient who demanded to smoke from harming self or others, from 20% and 37% (Wards A and B) 1 week post-implementation to 20% and 10% respectively 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated).

In **Hempel's 2002 [USA +]** before and after study with the same sample of forensic patients assessed 4 weeks prior to, and 4 weeks after implementation a local (hospital board's) smokefree (campus) buildings and smokefree grounds policy, there was a significant post-implementation decline in verbal aggression in heavy smokers (≥19 cigarettes/day) ($Z = -2.12$, $p=0.034$). There were no significant changes post-implementation in verbal aggression for light (1-9 cigarettes/day) and moderate smokers (10-18 cigarettes/day) and a decline in non-smokers closely approached significance ($Z = -1.91$, $p=0.056$). There were no significant changes 4 weeks after implementation of the smokefree policy in physical aggression for non-smokers, light smokers, moderate smokers or heavy smokers, compared with 4 weeks pre-implementation.

In **Quinn's 2000 [USA -] uncontrolled before and after study (with same sample)**, there were n=1,184 verbal acts of aggression during the month of November 1998, the month before implementation of the local (hospital's) smokefree (campus) buildings and smokefree grounds policy on 1st December 1998. There were n=656 verbal acts of aggression a month later, during January 1999, which corresponded to a significant 45% decrease ($p<0.01$). One month pre-implementation, there were n=266 physical acts of aggression and 1 month post-policy, there were n=133 physical acts of aggression, which corresponded to a significant 50% decrease ($p<0.01$).

One **uncontrolled before and after study** (with the same sample) set in England (**Shetty 2010 [UK +])** found a reduction in the number of recorded physical aggression incidents by male patients from 3 months before implementing the national indoor smokefree legislation and a local (NHS Trust's) smokefree grounds policy, to 3 months after (20 incidents versus 11 incidents); the change in rates of physical aggression was not statistically significant ($p=0.6$). Twelve months post-implementation, there was no recorded physical aggression by male patients directly related to nicotine withdrawal. Three months pre-implementation of the national indoor legislation and local outdoors policy, n=3 male patients threatened violence to staff or other patients if forced to abstain, however none of the patients who threatened violence were involved in any aggressive incident during the follow-up period. There was a reduction in the number of recorded verbal aggression incidents by male patients from 3 months before implementation to 3 months after (29 incidents versus 16 incidents); the change in rates of verbal aggression was not statistically significant ($P=0.9$). Three months post-implementation, n=2 male patients were involved in verbal outbursts attributed to nicotine withdrawal during the first month after policy implementation. Twelve months post-implementation, there was no recorded verbal aggression by male patients directly related to nicotine withdrawal.

In **Cormac's 2010 [UK +] uncontrolled before and after study (with a different patient sample)**, there were significantly more violent incidents for pre-ban smokers in July 2007 (n=198) after implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy than in December 2006 before its implementation (n=158) ($p=0.01$). Other results were not significant for comparisons between pre-ban smokers or non-smokers or all patients for either time period comparison.

In an **uncontrolled before and after study, Haller 1996 [USA +]** reported there was no significant change in the proportion of 8-hour shifts in which physical aggression against other people or

physical aggression against objects occurred over the month preceding a local (hospital's) smokefree buildings and smokefree grounds policy and during the 4 months following its implementation. The proportion of 8-hour shifts in which physical aggression against self occurred increased during the second month of the smokefree policy (from 1.2% to 17.9%), then returned to the pre-implementation level by 3 months (1.2%) and 4 months (14.3%) into its implementation ($p<0.01$). The proportion of 8-hour shifts in which verbal aggression occurred decreased 1 month following the policy's implementation (from 35.7% to 21.4%), increased during the second month (60.7%), and returned to the pre-implementation levels at 3 (23.8%) and 4 months (35.7%) ($p<0.01$).

In an **uncontrolled before and after study (with different sample) (Matthews 2005 [USA -])**, no significant differences were found in the 3 months before and 3 months after the local (hospital's) smokefree buildings policy was implemented related to the total number of patients who committed at least 1 episode of assault or self-harm. No significant differences were found in the total number of episodes of assault or self-harm between the time periods pre- and post- policy implementation.

Rauter's 1997 [USA +] cohort study found that the highest frequency of assaults was during the 6 months of baseline period one (15 months prior to the implementation of a local (hospital's) smokefree buildings policy), with an average of 49 incidents per month. The first 3 months of the ban showed a decrease in the average monthly assault rate (46.30 incidents) when compared to the same time 1 year previously (58.67 incidents). One year after implementation, an average of 28.5 monthly assault rates occurred in the first 6 months of the year. No further statistical analysis reported. A sub-set of recorded patient assaults were related to smoking. Three smoking-related assaults occurred in the final month of baseline period two (3 months prior to the ban) and four smoking-related assaults occurred in the first 3 months of the policy. One year after smokefree implementation, four smoking-related assaults occurred in the first 6 months of the year.

Another cohort study in the USA (**Velasco 1996 [USA -]**) reported that the mean number of verbal assaults during the period immediately after implementation of a local (hospital's) smokefree buildings policy in 1991 was significantly higher than in the period before implementation ($F=8.80$, $df=2,109$, $p<0.001$), but there was no difference in the number of assaults before implementation and in the 1993 follow up. The mean number of physical assaults did not change significantly between any of the three time periods; 6 weeks immediately before implementation of the ban, 6 weeks immediately after the 1991 ban, and the 1993 follow up.

Other Impacts on Patients: Inpatient Violent Incidents/Aggression (Mental Healthcare)

Evidence statement 3.1: There is **moderate** evidence from four before and after studies, three in the USA (**Hempel 2002 [+], Quinn 2000 [-], Haller 1996 [+])** and one in the UK **(Shetty 2010 [+]**) that smokefree implementation with supporting strategies may decrease or have no effect on inpatient verbal aggression in a mental healthcare setting. One cohort study in the USA (**Velasco 1996 [-]**) showed an immediate significant increase in verbal aggression, but this was not maintained in the long term.

UK Applicability: Evidence comes from one recent UK study but mostly from outside the UK. However nearly half the studies test smokefree grounds and buildings (a policy implemented in parts of the UK), the others test indoor smokefree already national legislation in the UK. There is no reason to believe the effect is not applicable to the UK setting.

In the USA, **Hempel 2002 [+]** reported a significant decline in verbal aggression in heavy smokers (≥19 cigs/day) ($Z = -2.12$, $p=0.034$) 4 weeks after implementation a local (hospital board's) smokefree

(campus) buildings and smokefree grounds policy compared with 4 weeks prior to implementation. There were no significant changes for non-smokers, light smokers (1-9 cigs/day) and moderate smokers (10-18 cigs/day). ***Supporting strategies*** *included education for staff about potential withdrawal symptoms, and any tobacco products found on patients were seized.*

In the USA, **Quinn 2000 [-]** reported a significant decrease in verbal acts of aggression 1 month post-implementation of a local (hospital's) smokefree (campus) buildings and smokefree grounds policy compared to the month prior to implementation ($p<0.01$). ***Supporting strategies*** *included written policies, pharmacotherapy and patient education about smoking and tobacco addiction recovery.*

In the USA, **Haller 1996 [+]** reported a significant decrease in verbal aggression 1 month following a local (hospital's) smokefree buildings and smokefree grounds policy, an increase during the second month, and a return to pre-policy levels at 3 and 4 months following the policy's implementation ($p<0.01$). **Supporting strategies** were pharmacotherapies, staff education to recognise and treat nicotine withdrawal and written information for patients.

In the UK, **Shetty 2010 [+]** reported a non-significant reduction in the number of recorded verbal aggression incidents by male patients from 3 months before implementing the national indoor smokefree legislation and a local (NHS Trust's) smokefree grounds policy, to 3 months after ($P=0.9$). Two male patients were involved in verbal outbursts attributed to nicotine withdrawal during the first month after implementation, however 12 months after implementation, there was no recorded verbal aggression directly related to nicotine withdrawal. ***Supporting strategies*** *were posters, group and individual cessation support, pharmacotherapies, closure of smoking rooms and staff training.*

In the USA, **Velasco 1996 [-]** reported that the mean number of verbal assaults during the 6-week period immediately after implementation of local (hospital's) smokefree buildings policy in 1991 was significantly higher than in the 6-week period before implementation ($p<0.001$). ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

Evidence statement 3.2: There is **inconsistent** evidence from six before and after studies in the USA (**Hempel 2002 [+], Quinn 2000 [-], Haller 1996 [+], Matthews 2005 [-])** and the UK (**Shetty 2010 [+], Cormac 2010 [+],**) two cohort studies in the USA (**Rauter 1997 [+], Velasco 1996 [-]**) and one interrupted time series in the USA (**Erwin 1991 [-]**) that smokefree implementation with supporting strategies may affect inpatient physical aggression in a **mental healthcare setting**.

UK Applicability: Evidence comes from two recent UK studies but mostly from outside the UK. However over half the studies test smokefree grounds and buildings (a policy implemented in parts of the UK), the others test indoor smokefree already national legislation in the UK. There is no reason to believe the effect is not applicable to the UK setting.

One before and after study in the UK (**Cormac 2010 [+]**) showed a significant increase in inpatient violent incidents for pre-implementation smokers 4 months after implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy compared with 4 months before implementation ($p=0.01$). There was no significant difference between pre-ban smokers assessed 1 month pre- and 1 month post-implementation. ***Supporting strategies*** *were pharmacotherapy, cessation support, staff training and patient surrender of smoking materials.*

Five studies that reported significance values found that smokefree implementation with supporting strategies either significantly decreases inpatient physical aggression (**Quinn 2000 [-]**), or has no

significant effect on inpatient physical aggression (**Hempel 2002 [+]**, **Haller 1996 [+]**, **Matthews 2005 [-]**, **Velasco 1996 [-]**). Three further studies reported a non-significant decline in inpatient physical aggression (**Shetty 2010 [+]**, **Rauter 1997 [-]**) or a decline in inpatient physical aggression (without providing the p values) (**Erwin 1991 [-]**) in a **mental healthcare setting**.

One interrupted time series in the USA (**Erwin 1991 [-]**) reported a decline in the proportion of nursing staff reporting that they intervened verbally or physically to prevent a patient who demanded to smoke from harming self or others, between 1 week post-implementation and 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke*.

In the USA, **Hempel 2002 [+]** reported no significant changes in physical aggression in non-smokers or smokers 4 weeks after implementation a local (hospital board's) smokefree (campus) buildings and smokefree grounds policy compared with 4 weeks prior to implementation. ***Supporting strategies*** *included education for staff about potential withdrawal symptoms, and any tobacco products found on patients were seized.*

In the USA, **Quinn 2000 [-]** reported a significant decrease in physical acts of aggression 1 month post-implementation of a local (hospital's) smokefree (campus) buildings and smokefree grounds policy compared to the month prior to implementation ($p<0.01$). ***Supporting strategies*** *included written policies, pharmacotherapy and patient education about smoking and tobacco addiction recovery.*

In the UK, **Shetty 2010 [+]** reported a non-significant reduction in the number of recorded physical aggression incidents by male patients from 3 months before implementing the national indoor smokefree legislation and a local (NHS Trust's) smokefree grounds policy, to 3 months after ($P=0.6$). ***Supporting strategies*** *were posters, group and individual cessation support, pharmacotherapies, closure of smoking rooms and staff training.*

In the USA, **Haller 1996 [+]** reported no significant change in physical aggression against other people or physical aggression against objects occurred over the 1 month preceding the local (hospital's) smokefree buildings and smokefree grounds policy or the 4 months following its implementation. There was a significant increase in physical aggression against self during the second month post-policy and a decrease to pre-policy levels at 3 and 4 months following the policy's implementation ($p<0.01$). ***Supporting strategies*** *were pharmacotherapies, staff education to recognise and treat nicotine withdrawal and written information for patients.*

In the USA, **Matthews 2005 [-]** reported no significant differences between the number of episodes or total number of patients who committed at least 1 episode of assault or self-harm in the 3 months before and 3 months after the local (hospital's) smokefree buildings policy was implemented. ***Supporting strategies*** *included patient education about nicotine addiction and withdrawal and pharmacotherapies.*

In the USA, **Rauter 1997 [-]** reported a decrease in the average monthly assault rate for the first three months of the implementation of a local (hospital's) smokefree buildings policy when compared to the same time 1 year previously. ***Supporting strategies*** *included smoking reduction workshops and patients wishing to participate were urged to do so.*

In the USA, **Velasco 1996 [-]** reported no significant change in the mean number of physical assaults between any of the three time periods: 6 weeks immediately before implementation of the local (hospital's) smokefree buildings policy, 6 weeks immediately after the 1991 ban, and the 1993 follow up. ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

3.3.1.2 Seclusion and Restraint (Mental Healthcare)

Six before and after studies, one with a cross sectional component, and one cohort study report outcomes relating to the impact of local policy or national legislation for implementation of smokefree buildings and/or grounds with supporting strategies on patient seclusion and restraint in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). There was generally a decrease or no change in adverse effects from local-level smokefree policy or national smokefree legislation implementation.

All studies reporting outcome measures for the application of restraints are from the USA. The most recent guidance for the application of mechanical (or physical) restraints in the UK, states that "*Mechanical restraints are not a first-line response or standard means of managing disturbed/violent behaviour in acute mental health care settings. In the event that they are used, it must be a justifiable, reasonable and proportionate response to the risk posed by the service user, and only after a multidisciplinary review has taken place. Legal, independent expert medical and ethical advice should be sought and documented*" (NCC-NSC, 2005: p. 99). The Guidance notes that mechanical restraints are used only in "exceptional circumstances" in the UK, and there is limited evidence for their use[11].

In **Cormac's 2010 [UK +] uncontrolled before and after study (with a different patient sample)**, there were no significant results for comparisons of the numbers of seclusions between 1 month before and 1 month after implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy, nor between 4 months before and 4 months after implementation, for smokers or non-smokers or all patients for either time period comparison.

In **Erwin's 1991 [USA -]** interrupted time series, there was little change in nursing staff reporting that they had encouraged room "time outs" to decrease stimulation, from 40% and 88% (Wards A and B) 1 week post-implementation to 60% and 70% (Wards A and B) 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated).

In an **uncontrolled before and after study, Haller 1996 [USA +]** reported there were no significant changes (to $p<0.05$ level) in the proportion of patients who were secluded 1 month prior to a local (hospital's) smokefree buildings and smokefree grounds policy (26% of n=27) and during the 4 months following its implementation (23% of n=26 patients 1 month after implementation, 20% of n=30 patients 2 months after, 25% of n=36 patients 3 months after and 14% of n=43 patients 4 months after implementation). Nor were there significant changes (to $p<0.05$ level) in the proportion of patients who were restrained (19% of n=27 patients 1 month prior, 15% of n=26

[11] An update of the guideline is currently in the process of being scheduled into the work programme, however no new evidence relating to the safe use of physical interventions (seclusion or restraint) in health and social care settings for short term management of violent/aggressive psychiatric patients which may potentially change the current recommendation(s) was identified (http://www.nice.org.uk/nicemedia/live/10964/58082/58082.pdf, accessed 15th October 2012).

patients 1 month post, 7% of n=30 patients 2 months post, 6% of n=36 patients 3 months post and 7% of n=43 patients 4 months post implementation).

Hempel's 2002 [USA +] before and after study assessed the same sample of forensic patients 4 weeks prior to, and 4 weeks after implementation of a local (hospital board's) smokefree (campus) buildings and smokefree grounds policy. There were no significant changes in the mean instances per week of seclusion or restraint prior to the policy and following its implementation for non-smokers, light smokers (1-9 cigarettes/day), moderate smokers (10-18 cigarettes/day), or heavy smokers (≥19 cigarettes/day).

In an **uncontrolled before and after study (with different sample) (Matthews 2005 [USA -])**, no significant differences were found in the 3 months before and 3 months after the local (hospital's) smokefree buildings policy was implemented related to the total number of patients who required seclusion or restraint.

In **Patten's 1995 [USA +] uncontrolled before and after study** examining hospital chart data, there was no significant change in the use of restraints between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy ($p=0.175$). Seclusion rates, however, were significantly lower post-implementation ($p<0.05$).

In **Velasco's 1996 [USA -] cohort study**, the number of applications of soft restraints (cloth devices e.g. poesy vest) was significantly higher during the 1993 follow up period than during the period before implementation of the local (hospital's) smokefree buildings policy ($F=14.36$, $df=2,105$, $p<0.001$). The mean number of leather wrist or ankle bindings did not change significantly between any of the three time periods; 6 weeks immediately before implementation of the policy, 6 weeks immediately after the 1991 ban, and the 1993 follow up.

Other Impacts on Patients: Inpatient Seclusion and Restraint (Mental Healthcare)

Evidence statement 3.3: There is **moderate** evidence from five before and after studies, one in the UK (**Cormac 2010 [UK +])** and four in the USA **(Haller 1996 [+], Hempel 2002 [+], Matthews 2005 [-], Patten 1995 [+]**), and one interrupted time series in the USA (**Erwin 1991 [-]**) that the introduction of smokefree in mental healthcare settings decreases or has no significant effect on incidents of inpatient seclusion and restraint. One poor quality cohort study in the USA (**Velasco 1996 [-]**) showed a significant increase for soft restraints but no difference for leather restraints.

UK Applicability: Evidence comes from one recent UK study but mostly from outside the UK. However over half the studies test smokefree grounds and buildings (a policy implemented in parts of the UK), the others test indoor smokefree already national legislation in the UK. The use of mechanical or physical restraints is not a first-line response in the UK and so this is of limited applicability in the UK.

Cormac 2010 [+] in the UK found no significant results for comparisons of the numbers of seclusions between pre-ban smokers or non-smokers or all patients for between 1 month before and 1 month after implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy, nor between 4 months before and 4 months after implementation. ***Supporting strategies*** *were pharmacotherapy, cessation support, staff training and patient surrender of smoking materials.*

Haller 1996 [+] in the USA reported no significant changes in the proportion of patients who were secluded or the proportion of patients who were restrained over the 1 month preceding the local (hospital's) smokefree buildings and smokefree grounds policy or the 4 months following its implementation. ***Supporting strategies*** *were pharmacotherapies, staff education to recognise and treat nicotine withdrawal and written information for patients.*

Hempel 2002 [+] in the USA reported no significant changes in mean instances per week of seclusion or restraint in non-smokers or smokers 4 weeks after implementation a local (hospital board's) smokefree (campus) buildings and smokefree grounds policy compared with 4 weeks prior to implementation. ***Supporting strategies*** *included education for staff about potential withdrawal symptoms, and any tobacco products found on patients were seized.*

Matthews 2005 [-] in the USA reported no significant differences between the total number of patients who required seclusion or restraint in the 3 months before and 3 months after the local (hospital's) smokefree buildings policy was implemented. ***Supporting strategies*** *included patient education about nicotine addiction and withdrawal and pharmacotherapies.*

One before and after study in the USA (**Patten 1995 [+]**) found no significant change in the use of restraints between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy ($p=0.175$). Seclusion rates, however, were significantly lower post-implementation ($p<0.05$). ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence*.

One interrupted time series in the USA (**Erwin 1991 [-]**) reported little change in nursing staff reporting that they had encouraged room "time outs" to decrease stimulation, between 1 week post-implementation and 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke*.

In the USA, **Velasco 1996 [-]** reported that the number of applications of soft restraints was significantly higher during the 1993 follow up period than during the period before implementation of the local (hospital's) smokefree buildings policy ($p<0.001$). The mean number of leather wrist or ankle bindings did not change significantly between any of the three time periods; 6 weeks immediately before and after implementation of the policy and the 1993 follow up. ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

3.3.1.3 Security Calls for Help (Mental Healthcare)

One cohort study reported outcomes relating to the impact of local policy for implementation of smokefree buildings with supporting strategies on security calls in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). There was no change in adverse effects from local-level smokefree policy or national smokefree legislation implementation.

In **Velasco's 1996 [USA -] cohort study**, the mean number of security calls (for help from security officers) did not change significantly between any of the three time periods: 6 weeks immediately before implementation of the local (hospital's) smokefree buildings policy, 6 weeks immediately after the 1991 ban, and the 1993 follow up.

Other Impacts on Patients: Security Calls (Mental Healthcare)

Evidence statement 3.4: There is **weak** evidence from one cohort study in the USA (**Velasco 1996 [-]**) that recorded security calls (for help from security officers) may not increase with the introduction of smokefree in mental healthcare settings.

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the strategy's effect is not applicable to the UK setting.

In the USA, **Velasco 1996 [-]** reported no significant change in the mean number if security calls for help from security officers between any of the three time periods: 6 weeks immediately before implementation of the local (hospital's) smokefree buildings policy, 6 weeks immediately after the 1991 ban, and the 1993 follow up. ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

3.3.1.4 Medication Changes (Mental Healthcare)

Five before and after studies, one before and after and cross sectional study and one cohort study report outcomes relating to the impact of local policy or national legislation for implementation of smokefree buildings and/or grounds with supporting strategies on changes in medications in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). Almost all related to as required (PRN) medications, although one (**Shetty 2010 [UK +]**) also reported changes to serum clozapine (an antipsychotic drug) levels and one (**Cormac 2010 [UK +]**) reported changes to regular antipsychotics and benzodiazepines. There were inconsistent results showing no change, a decrease or an increase in adverse effects from local-level smokefree policy or national smokefree legislation implementation.

In **Cormac's 2010 [UK +] uncontrolled before and after study (with a different patient sample)**, there was a significant decline in mean dose of regular antipsychotic medication for smokers from 1 month before (M=64.1, SD 39.4) to 1 month after (M=61.2, SD 37.4, 95% CI 0.37-5.42; p=0.025) implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy. Other results were not significant for comparisons of mean dose of regular or PRN antipsychotics or benzodiazepines between pre-ban smokers or non-smokers for either time period comparison (1 month pre- versus 1 month post-implementation and 4 months pre- versus 4 months post implementation).

In **Erwin's 1991 [USA -] interrupted time series**, there was a reduction in the number of patients offered PRN medications, from 60% and 75% (Wards A and B) 1 week post-implementation to 40% and 40% (Wards A and B) 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated).

In an **uncontrolled before and after study, Haller 1996 [USA +]** reported there were no significant changes (to $p<0.05$ level) in the proportion of patients who received PRN medications 1 month prior to a local (hospital's) smokefree buildings and smokefree grounds policy (74% of n=27) and during the 4 months following its implementation (62% of n=26 patients 1 month after implementation, 70% of n=30 patients 2 months after, 61% of n=36 patients 3 months after and 51% of n=43 patients 4 months after implementation).

Hempel's 2002 [USA +] before and after study assessed the same sample of forensic patients 4 weeks prior to, and 4 weeks after implementation of a local (hospital board's) smokefree (campus)

buildings and smokefree grounds policy. There were no significant changes in the mean instances per week of PRN for agitation and PRN for aggression prior to the policy and following its implementation for non-smokers, light smokers (1-9 cigarettes/day), moderate smokers (10-18 cigarettes/day), or heavy smokers (≥19 cigarettes/day).

In **Patten's 1995 [USA +] uncontrolled before and after study** examining hospital chart data, there were no significant differences in total PRN medication use (p=0.249) or in the percentage of patient days with PRN medication (p=0.166) between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy. Seclusion rates, however, were significantly lower post-implementation (p<0.05).

One **uncontrolled before and after study** (with the same sample) set in England (**Shetty 2010 [UK +])** found no statistically significant change in rates of PRN tranquilisers for male patients from 3 months before implementing the national indoor smokefree legislation and a local (NHS Trust's) smokefree grounds policy, to 3 months after (p=0.6 for lorazepam and p=0.4 for haloperidol). Twenty-three male patients received clozapine (it was not specifically reported at which time point), all of whom were smokers; the increase in serum clozapine levels was significant post-implementation (p=0.006). It was necessary to reduce the dose in four patients (it was not specifically reported at which time point).

In **Velasco's 1996 [USA -] cohort study**, the use of PRN medication for agitation, including anxiety, was significantly higher during the 6 week period immediately after implementation of the local (hospital's) smokefree buildings policy than during the 6 week period immediately before (F=2.89, df=2,107, p<0.06).

Other Impacts on Patients: Inpatient Medication Changes (Mental Healthcare)

Evidence statement 3.5: There is **inconsistent** evidence from five before and after studies, two in the UK (**Cormac 2010 [+], Shetty 2010 [+])** and three in the USA **(Haller 1996 [+], Hempel 2002 [+], Patten 1995 [+]**), one interrupted time series in the USA (**Erwin 1991 [-]**) and one cohort study in the USA (**Velasco 1996 [-]**) that the introduction of smokefree legislation may change the required doses of inpatient PRN medication. Five before and after studies, two in the UK (**Cormac 2010 [+], Shetty 2010 [+])** and three in the USA **(Haller 1996 [+], Hempel 2002 [+], Patten 1995 [+]**) and one interrupted time series in the USA (**Erwin 1991 [-]**) suggest that required doses of inpatient PRN medications do not change or may decrease, whereas one cohort study in the USA (**Velasco 1996 [-]**) suggests that required doses of inpatient PRN medications for agitation and aggression may increase with the introduction of smokefree in mental healthcare settings.

UK Applicability: Evidence comes from two recent UK studies but mostly from outside the UK. However over half the studies test smokefree grounds and buildings (a policy implemented in parts of the UK), the others test indoor smokefree already national legislation in the UK. There is no reason to believe the effect is not applicable to the UK setting.

In the UK, **Cormac 2010 [+]** found a significant decline in mean dose of regular antipsychotic medication for smokers from 1 month before to 1 month after (95% CI 0.37-5.42; p=0.025) implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy. Other results were not significant for comparisons of mean dose of regular or PRN antipsychotics or benzodiazepines between pre-ban smokers or non-smokers for the 1 month pre-post or the 4 month pre-post comparisons. ***Supporting strategies*** *were pharmacotherapy, cessation support, staff training and patient surrender of smoking materials.*

One interrupted time series in the USA (**Erwin 1991 [-]**) reported a reduction in the number of patients offered PRN medications, between 1 week post-implementation and 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated). ***Supporting strategies*** *were based around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke*.

In the USA, **Haller 1996 [+]** reported no significant changes in the proportion of patients who received PRN medications over the 1 month preceding the local (hospital's) smokefree buildings and smokefree grounds policy or the 4 months following its implementation. ***Supporting strategies*** *were pharmacotherapies, staff education to recognise and treat nicotine withdrawal and written information for patients.*

In the USA, **Hempel 2002 [+]** reported no significant changes in mean instances per week of PRN for agitation and aggression in non-smokers or smokers 4 weeks after implementation a local (hospital board's) smokefree (campus) buildings and smokefree grounds policy compared with 4 weeks prior to implementation. ***Supporting strategies*** *included education for staff about potential withdrawal symptoms, and any tobacco products found on patients were seized.*

In the UK, **Shetty 2010 [+]** reported a non-statistically significant change in rates of PRN tranquilisers for male patients from 3 months before implementing the national indoor smokefree legislation and a local (NHS Trust's) smokefree grounds policy, to 3 months after (p=0.6 for lorazepam and p=0.4 for haloperidol). ***Supporting strategies*** *were posters, group and individual cessation support, pharmacotherapies, closure of smoking rooms and staff training.*

One before and after study in the USA (**Patten 1995 [+]**) reported no significant differences in total PRN medication use (p=0.249) or in the percentage of patient days with PRN medication (p=0.166) between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy. ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence*.

In the USA, **Velasco 1996 [-]** reported that the use of PRN medication for anxiety was significantly higher during the 6-week period immediately after implementation of local (hospital's) smokefree buildings policy in 1991 was significantly higher than in the 6-week period before implementation (p<0.06). ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

Evidence statement 3.6: There is evidence from two before and after studies in the UK (**Cormac 2010 [+]**), **Shetty 2010 [+]**) about the impact of smokefree legislation on inpatient antipsychotic medication in a **mental healthcare setting**.

UK Applicability: The evidence comes from two recent UK studies thus is highly applicable.

There is **weak** evidence from one before and after study in the UK **(Cormac 2010 [+]**) that required doses of antipsychotic medication significantly decreases with the introduction of a national indoor smokefree legislation and local (NHS Trust's) smokefree grounds policy *(95% CI 0.37-5.42; p=0.025)*.

In the UK, **Cormac 2010 [+]** found a significant decline in mean dose of regular antipsychotic medication for smokers from 1 month before to 1 month after (95% CI 0.37-5.42; p=0.025) implementation of the national indoor smokefree legislation in England and a local (NHS Trust's)

smokefree grounds policy. Other results were not significant for comparisons of mean dose of regular or PRN antipsychotics between pre-ban smokers or non-smokers for the 1 month pre-post or the 4 month pre-post comparisons. ***Supporting strategies*** *were pharmacotherapy, cessation support, staff training and patient surrender of smoking materials.*

There is **weak** evidence from one before and after study in the UK (**Shetty 2010 [+]**) that serum levels of clozapine in male patients significantly increases with the introduction of smokefree *the* national indoor smokefree legislation and a local (NHS Trust's) smokefree grounds policy *(p=0.006)*.

In the UK, **Shetty 2010 [+]** reported a statistically significant increase in serum clozapine levels (p=0.006) for male patients from 3 months before implementing the national indoor smokefree legislation and a local (NHS Trust's) smokefree grounds policy, to 3 months after. ***Supporting strategies*** *were posters, group and individual cessation support, pharmacotherapies, closure of smoking rooms and staff training.*

3.3.1.5 Disruptive Behaviours (Mental Healthcare)

One before and after study reported outcomes relating to the impact of local policy for implementation of smokefree buildings and grounds with supporting strategies on a combined measure of disruptive behaviours in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). There was a decrease in adverse effects from local-level smokefree policy or national smokefree legislation implementation.

Hempel's 2002 [USA +] before and after study assessed the same sample of forensic patients 4 weeks prior to, and 4 weeks after implementation of a local (hospital board's) smokefree (campus) buildings and smokefree grounds policy. Instances of PRN for agitation, PRN for aggression, verbal aggression, physical aggression, loss of privileges, and restraint and seclusion were combined to give a total for instances of 'disruptive behaviours'. Overall, there was a significant 49% post-implementation decline in disruptive behaviours among the moderate smokers (10-18 cigarettes/day) (Z = -2.24 p=0.025) and heavy smokers (≥19 cigarettes/day) (Z = -2.71, p=0.007). There were no significant post-implementation changes in disruptive behaviours among the non-smokers or light smokers (1-9 cigarettes/day).

Other Impacts on Patients: Inpatient Disruptive Behaviours (Mental Healthcare)

Evidence statement 3.7: There is **weak** evidence from one before and after study in the USA (**Hempel 2002 [+]**) that combined measures of inpatient disruptive behaviours decreases with the introduction of smokefree in mental healthcare settings, particularly amongst moderate and heavy smokers. Instances of PRN for agitation, PRN for aggression, verbal aggression, physical aggression, loss of privileges, and restraint and seclusion were combined to give a total for instances of inpatient 'disruptive behaviours'. Overall, there was a significant post-ban local (hospital board's) smokefree (campus) buildings and smokefree grounds policy decline in inpatient disruptive behaviours among the moderate smokers, Z = -2.24 p=0.025 and heavy smokers, Z = -2.71, p=0.007. There were no significant post-ban changes in inpatient disruptive behaviours among the non-smokers or light smokers. ***Supporting strategies*** *include provision of education to staff about potential withdrawal symptoms, and any tobacco products found on patients were seized.*

UK Applicability: This evidence was conducted outside the UK however the study tests smokefree grounds and buildings (a policy implemented in parts of the UK). There is no reason to believe the strategy's effect is not applicable to the UK setting.

3.3.1.6 Admittance and Length of Stay (Mental Healthcare)

Four before and after studies and two cohort studies report outcomes relating to the impact of local policy for implementation of smokefree buildings and/or grounds with supporting strategies on patient attendance and premature terminators ('drop-outs') in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). In five of the studies, this was specifically related to inpatients signing out against medical advice (AMA), however one also reported the number of inpatients who eloped (**Haller 1996 [USA +]**) and one only reported premature terminators from the outpatient programme (**Sterling 1994 [USA -]**). There was no change in adverse effects from local-level smokefree policy or national smokefree legislation implementation.

In an **uncontrolled before and after study, Haller 1996 [USA +]** reported there were no significant changes (to $p<0.05$ level) in the proportion of patients who were secluded 1 month prior to a local (hospital's) smokefree buildings and smokefree grounds policy (4% of n=27) and during the 4 months following its implementation (zero of n=26 patients 1 month after implementation, 20% of n=30 patients 2 months after, 8% of n=36 patients 3 months after and 7% of n=43 patients 4 months after implementation). Nor were there significant changes (to $p<0.05$ level) in the proportion of patients who eloped (zero % of n=27 patients 1 month prior, 15 zero of n=26 patients 1 month post, 7% of n=30 patients 2 months post, 3% of n=36 patients 3 months post and zero of n=43 patients 4 months post implementation).

In **Patten's 1995 [USA +] uncontrolled before and after study** examining hospital chart data, it was reported that two patients left against medical advice 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy. None were reported to have left during the 3 months pre-implementation however this difference was not significant ($p=0.500$).

In an **uncontrolled before and after study, Rees 2008 [USA +]** reported there was no evidence of increased rates of patients leaving the unit against medical advice, or transfers to other inpatient facilities among tobacco users between the 12 months before and 12 months after implementation of a local (university hospital's) smokefree buildings policy in its inpatient medical detoxification unit ($p>0.10$). The number of admissions appeared to remain stable, with 516 in the 12 months before, and 561 in the 12 months after implementation of the smokefree buildings policy the ban. The average length of stay significantly decreased after the implementation; in the 12 months pre-smokefree, the average stay was 5.15 days and in the 12 months post-smokefree, the average stay was 4.79 days ($p<0.05$). The decrease was similar for patients who used tobacco and those who did not ($p>0.10$). Patient demographics also remained similar before and after; mean age: pre-ban 36.7 years; post-ban 35.7 years, gender pre-ban 69.6% male, post-ban 73.6% male, tobacco users pre-ban 80.2%; post-ban 84.0%, European Americans; Pre-ban 72.7% Post-ban 76.5% (all not significant).

In **Sterling's 1995 [USA -] cohort study**, there was no significant increase in the proportion of outpatient premature terminators ('drop-outs') observed at 1 and 3 months following the implementation of a local (facility's) smokefree buildings policy compared with 1 and 3 months before ($p>0.05$). The average number of daily new admissions per week did not change significantly between the 3 months prior to smokefree buildings policy implementation (1.74 (SD=0.55)) and the 3 months following (1.43 (SD=0.59), $t(24)=1.40$, $p>0.05$). Results indicated that the average number of outpatients attending groups per week did not decrease significantly following the smokefree buildings policy implementation, with a mean of 21.75 (SD=2.18) group attendees for 1 and 3 months before, and 19.75 (SD=2.99) for 1 and 3 months following, ($t(24)=1.96$, $p> 0.05$).

In **Velasco's 1996 [USA -] cohort study**, the mean number of discharges against medical advice did not change significantly between any of the three time periods: 6 weeks immediately before implementation of the local (hospital's) smokefree buildings policy, 6 weeks immediately after the 1991 ban, and the 1993 follow up.

In a randomised controlled trial (**Kempf 1996 [USA +]**), 2% of 105 adolescents randomly assigned to the tobacco-free residential programme based at the intervention campus, with a local (facility's) smokefree buildings and grounds (campus) policy, declined admission compared to 5% of 105 adolescents randomly assigned to the residential programme based at the control campus, with a smokefree buildings and designated outdoor areas policy. Pre-allocation, 17% of 105 adolescents randomly assigned to the tobacco-free programme declined admission compared to 22% of those randomly to the programme based at the control campus, this difference was non-significant (p=0.38). Retention at 2 days was slightly higher in the programme based at the control campus compared with the intervention campus (95% vs. 91%), although this difference is non-significant (p=0.43). Retention at 2 weeks was slightly higher in the programme at the intervention campus with the smokefree campus policy (80% vs. 74%), although this difference is non-significant (p=0.37). Heavy smokers were much more likely to drop out in the first 2 days of treatment (p=0.005), although were equally likely to drop out of either programme (p=1.0).

Other Impacts on Patients: Patient Admittance and Length of Stay or Attendance (Mental Healthcare)

Evidence statement 3.8: Impact of smokefree legislation on patient admission and inpatient length of stay/outpatient length of attendance in a mental healthcare setting
There is evidence from three before and after studies in the USA (**Haller 1996 [+], Patten 1995 [+], Rees 2008 [+]**), one randomised controlled trial in the USA (**Kempf 1996 [+]**) and two cohort studies in the USA (**Sterling 1994 [-], Velasco 1996 [-]**) about the impact of smokefree legislation on patient admission and inpatient length of stay/outpatient length of attendance in a **mental healthcare setting**.

UK Applicability: This evidence was conducted outside the UK. Some of the studies test smokefree grounds and buildings (a policy implemented in parts of the UK), the others test indoor smokefree already national legislation in the UK. The age of the studies and the specific settings may not very applicable to the UK setting.

There is **moderate** evidence from one before and after study with inpatients in the USA (**Rees 2008 [+]**), one randomised controlled trial with inpatients in the USA (**Kempf 1996 [+]**) and one cohort study with outpatients in the USA (**Sterling 1994 [-]**) that the introduction of smokefree does not significantly impact on admission or retention to substance misuse treatment programmes.

In the USA, **Rees 2008 [+]** reported no significant changes in the number of admissions and patient demographics between the 12 months before and 12 months after implementation of a local (university hospital's) smokefree buildings policy in its inpatient medical detoxification unit. ***The supporting strategy*** *was that patients were informed of the indoor smoking ban as part of their admission screening process.*

In the USA, **Kempf 1996 [+]** reported that 2% of 105 adolescents randomly assigned to the tobacco-free residential programme based at the intervention campus, with a local (facility's) smokefree buildings and grounds (campus) policy, declined admission compared to 5% of 105 adolescents randomly assigned to the residential programme based at the control campus, with a smokefree

buildings and designated outdoor areas policy. Pre-allocation, there was no significant difference between adolescents randomly assigned to either programme who declined admission (p=0.38). There was no significant difference between the two programmes for retention at 2 days (p=0.43) or retention at 2 weeks (p=0.37) Heavy smokers were significantly more likely to drop out in the first 2 days of treatment (p=0.005), although were equally likely to drop out of either programme (p=1.0). ***No supporting strategies*** *were reported.*

In the USA, **Sterling 1995 [-]** reported no significant change in neither the average number of daily new admissions per week, nor average number of outpatients attending groups per week between 1 and 3 months before and 1 and 3 months after the implementation of a local (facility's) smokefree buildings policy (p>0.05). ***Supporting strategies*** *were that outpatients were informed of the ban by a therapist and posters were displayed.*

There is **weak** evidence from one before and after study in the USA (**Rees 2008 [+]**) that reported a significant decrease in the length of patient stay between the 12 months before and 12 months after implementation of a local (university hospital's) smokefree buildings policy in its inpatient medical detoxification unit (p<0.05). The decrease was similar for patients who used tobacco and those who did not (p>0.10). ***The supporting strategy*** *was that patients were informed of the indoor smoking ban as part of their admission screening process.*

There is **strong** evidence from three before and after studies with inpatients in the USA (**Haller 1996 [+], Patten 1995 [+], Rees 2008 [+]**) and two cohort studies in the USA, one with outpatients (**Sterling 1994 [-]**) and one with inpatients (**Velasco [-]**), that the introduction of smokefree in mental health care settings does not significantly impact on the number of discharges against medical advice or patient attendance.

In the USA, **Haller 1996 [+]** reported no significant changes in the proportion of patients who were discharged against medical advice or in the proportion of patients who eloped over the 1 month preceding the local (hospital's) smokefree buildings and smokefree grounds policy or the 4 months following its implementation. ***Supporting strategies*** *were pharmacotherapies, staff education to recognise and treat nicotine withdrawal and written information for patients.*

One before and after study in the USA (**Patten 1995 [+]**) reported a non-significant increase in the number of patients who left against medical advice (p=0.500) between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy. ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence*.

In the USA, **Rees 2008 [+]** reported no significant changes in the rates of patients leaving the unit against medical advice, or transfers to other inpatient facilities among tobacco users (p>0.10) between the 12 months before and 12 months after implementation of a local (university hospital's) smokefree buildings policy in its inpatient medical detoxification unit. ***The supporting strategy*** *was that patients were informed of the indoor smoking ban as part of their admission screening process.*

In the USA, **Sterling 1995 [-]** reported no significant change in the proportion of outpatient premature terminators ('drop-outs') between 1 and 3 months before and 1 and 3 months after the implementation of a local (facility's) smokefree buildings policy (p>0.05). ***Supporting strategies*** *were that outpatients were informed of the ban by a therapist and posters were displayed.*

In the USA, **Velasco 1996 [-]** reported no significant change in the mean number of discharges

against medical advice between any of the three time periods: 6 weeks immediately before implementation of the local (hospital's) smokefree buildings policy, 6 weeks immediately after the 1991 ban, and the 1993 follow up. ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

3.3.1.7 Complaint Investigations (Mental Healthcare)

One cohort study and one before and after study reported outcomes relating to the impact of local policy for implementation of smokefree buildings and/or grounds with supporting strategies on patients' perceived violations of their right to smoke in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). There was a small increase in adverse effects from local-level smokefree policy or national smokefree legislation implementation.

Rauter's 1997 [USA +] cohort study found that the for the first 6 months of the local (hospital's) smokefree buildings policy, 15 formal patient complaints about smoking (from patients perceiving the smokefree building as a violation of their human rights) were submitted, the majority from recently admitted patients. For the same period the following year there were four complaints.

In **Patten's 1995 [USA +] uncontrolled before and after study** examining hospital chart data, it was reported that only one female patient made a complaint related to a smoking issue 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy. No formal complaints were reported during the 3 months pre-implementation.

Other Impacts on Patients: Inpatient Complaint Investigations (Mental Healthcare)

Evidence statement 3.9: There is **moderate** evidence from one before and after study in the USA (**Patten 1995 [+]**) and one cohort study in the USA (**Rauter 1997 [+]**) that the introduction of smokefree in mental health care settings, results in a small number of formal complaints from inpatients about perceived violations of their right to smoke; complaints may be higher in number in the months immediately after implementation than 1 year later (**Rauter 1997 [+]**).

UK Applicability: This evidence was conducted outside the UK. One of the studies tests smokefree grounds and buildings (a policy implemented in parts of the UK), the other tests indoor smokefree already national legislation in the UK. Applicability to the UK could depend on the complaints structure for mental health inpatients in UK.

In the USA, **Rauter 1997 [-]** reported a decrease in formal inpatient complaints about smoking (from patients perceiving the smokefree building as a violation of their human rights) from the first 6 months of the implementation of a local (hospital's) smokefree buildings policy compared to the 1 year later. The majority from recently admitted patients. ***Supporting strategies*** *included smoking reduction workshops and patients wishing to participate were urged to do so.*

In the USA, **Patten 1995 [+]** reported that only one female inpatient made a complaint related to a smoking issue 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy. No complaints were reported during the 3 months pre-implementation. ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence*.

3.3.1.8 Smoking and Quitting Behaviours (Mental Healthcare)

Inpatient Smoking and Quitting Behaviours

One uncontrolled before and after study cohort study reported outcomes relating to the impact of local policy for smokefree buildings with supporting strategies on outcomes relating to patient smoking and cessation behaviours in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). There were inconsistent findings for adverse effects from local-level smokefree policy or national smokefree legislation implementation.

In **Etter's 2008 [Switzerland +] uncontrolled before and after study** (with different samples), there was no significant change in the cigarette consumption in the clinic of patients who smoked between 2003 (2 years pre-) and 2006 (1 year post-implementation of a local (hospital administration's) smokefree buildings policy) (24.1 to 23.7 mean cigarettes per day now (p=0.81) and 24.3 to 29.4 mean cigarettes per day before admission (p=0.17)). There was no significant change in smoking prevalence since admission in the clinic of patients who smoked between 2 years pre- and 1 year post-implementation of the smokefree buildings policy. Two years before implementation, 42.2% patients who smoked reported smoking more in the clinic than before admission compared with 39.6% 1 year post-implementation (no p values given).

In **Joseph's 1993 [USA +] cohort study**, 65% of smokers in the control group (pre-implementation of the local (facility's) smokefree buildings policy) and 61% of smokers in the intervention group (post-implementation) described their smoking habits at the time of interview as "the same" as on hospital admission. Twenty-two percent (control) and 22% (intervention) reported "less" smoking, and 10% (control) and 7% (intervention) reported "more" smoking than on admission. The differences between intervention and control groups were not significant. A significantly higher proportion of the intervention group (admitted after the smokefree policy was implemented) self-reported to have quit smoking for at least 1 week after discharge compared the control group (admitted before implementation): 19% (13 of 69) versus 6% (5 of 83), respectively (p=0.02).

Other Impacts on Patients: Inpatient Smoking and Quitting Behaviours (Mental Healthcare)

Evidence statement 3.10: There is **inconsistent** evidence from two before and after studies (one with a control group in the USA (**Joseph 1993 [+]**) and one uncontrolled in Switzerland (**Etter 2008 [+]**) that the introduction of smokefree in mental health care settings impacts on inpatient smoking and cessation behaviour outcomes in mental healthcare settings. There was no significant change in psychiatric inpatients' mean cigarette consumption or smoking prevalence in Switzerland (**Etter 2008 [+])** but in the USA **Joseph 1992 [+]** found significantly more male inpatients in substance abuse treatment quit for ≥1 week after discharge in the local (facility's) smokefree buildings policy (with supporting strategies) intervention group than the control group without smokefree premises.

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the effect is not applicable to the UK setting.

In the USA, **Joseph 1992 [+]** reports there were no significant differences between the proportion of smokers in the control group, admitted pre-implementation of the local (facility's) smokefree buildings policy), and the intervention group, admitted post-implementation, who reported currently smoking 'more', 'the same' or 'less' compared with smoking at admission 8-21 months earlier. A significantly higher proportion of the intervention group reported to have quit smoking for at least 1 week after discharge compared the control group (p=0.02). ***Supporting strategies*** *were*

that patients were informed of the policy and cessation programme prior to admission, and were required to agree in writing to nicotine abstinence during the treatment.

From 2 years pre- to 1 year post-implementation of a local (hospital administration's) smokefree buildings policy in Switzerland, **Etter 2008 [+]** reported no significant change in the cigarette consumption or smoking prevalence in the clinic of inpatients who smoked (p=0.81) and no significant change in smoking prevalence since admission to the clinic of inpatients who smoked. One year post-implementation, 2% fewer inpatients who smoked reported smoking more in the clinic than before admission compared with 2 years pre-implementation. ***Supporting strategies*** *included signage, cessation support, pharmacotherapies, closure of smoking rooms and staff training*.

Long Term Smoking Cessation (Mental Healthcare)

One before and after study and one cohort study reported outcomes relating to the impact of local policy for smokefree buildings with supporting strategies on long term smoking status in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). There were no changes for beneficial effects from local-level smokefree policy or national smokefree legislation implementation.

In **Patten's 1995 [USA +] uncontrolled before and after study** examining hospital chart data, 50 smokers (assessed at admission) were admitted to the psychiatric unit during the first 3 months of a local (hospital board's) smokefree buildings and smokefree grounds policy. Of these, n=19 were followed up 16-18 months after discharge. Ninety-five per cent (n=18) patients reported that they were current smokers; all of these patients reported resuming smoking immediately after hospital discharge; n=2 patients reported not smoking at 6 months and 12 months after discharge.

In **Joseph's 1993 [USA +] cohort study**, among the n=152 patients who smoked at admission (from retrospective viewing of chart data), ten self-reported they were not current smokers at the follow-up interview (8-19 months after discharge for the control group and 14-21 months after discharge for the intervention group); n=3 from the control (pre-implementation of the local (facility's) smokefree buildings policy) group and n=7 from the intervention (post-policy implementation) group.

Other Impacts on Patients: Long Term Smoking Cessation (Mental Healthcare)

Evidence statement 3.11: There is **moderate** evidence from one before and after study in the USA (**Patten 1995 [+]**) and one cohort study in the USA (**Joseph 1992 [+]**) that the introduction of smokefree with appropriate supporting strategies in mental health care settings minimal impact on long term smoking cessation.

UK Applicability: This evidence was conducted outside the UK and the policy covered in one study (indoor smokefree) is already national legislation in the UK, however the other study's policy is for smokefree grounds and buildings (a policy implemented in parts of the UK). There is no reason to believe the effect is not applicable to the UK setting.

In the USA, **Patten 1995 [+]** reported that amongst a sub-sample of patients who were current smokers at admission during the first 3 months of a local (hospital board's) smokefree buildings and smokefree grounds policy, then followed up 16-18 months post-discharge, all reported resuming smoking immediately after hospital discharge although 2 patients reported not smoking at 6 months

and 12 months after discharge. ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence*.

Joseph's 1993 [+] study in the USA reported that among the n=152 patients who smoked at admission (from retrospective viewing of chart data), ten self-reported they were not current smokers at the follow-up interview (8-21 months after discharge); n=3 from the control (pre-implementation of the local (facility's) smokefree buildings policy) group and n=7 from the intervention (post-policy implementation) group. ***Supporting strategies*** *were that patients were informed of the policy and cessation programme prior to admission, and were required to agree in writing to nicotine abstinence during the treatment*.

Inpatient Prescriptions For or Use of NRT (Mental Healthcare)

Three uncontrolled before and after studies, one cohort study and one interrupted time series reported outcomes relating to the impact of local policy or national legislation for implementation of smokefree buildings and/or grounds with supporting strategies on patient use of smoking cessation support in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). There were no changes for beneficial effects from local-level smokefree policy or national smokefree legislation implementation.

In **Cormac's 2010 [UK +] uncontrolled before and after study (with a different patient sample)**, n=149 inpatients commenced NRT in the 4 months pre-implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy. Post-implementation, an additional n=18 patients commenced NRT (month measurement taken was not reported).

An **uncontrolled before and after study** (**Etter 2008 [Switzerland 2008]**) reported a significant increase in the inpatients who smoked reporting that during their current stay a physician or nurse provided medication (a patch, gum or Zyban) to quit smoking (5.1% to 52.2%, p<0.001) and non-significant increase in those reporting staff advised them to quit smoking (15.4% to 42.6%, p=0.006) and staff helped them to quit smoking (2.6% to 19.6%, p=0.015) between 2 years pre- and 1 year post-implementation of a local (hospital administration's) smokefree buildings policy. Two years before and one year after implementation of the policy, there was a significant increase in staff reporting that the proportion of inpatients to whom NRT was provided significantly increased from 42.3% to 74.5% in 2006 (p<0.001, OR 4.0, 95% CI 1.6-9.9). There was a significant increase in the proportion of inpatients to whom help was provided to quit smoking increased from 26.9% in 2005 (post-partial indoor ban) to 58.2% in 2006 (post-implementation of the smokefree buildings policy) (p=0.007, OR 3.8, 95% CI 1.6-9.3).

In **Velasco's 1996 [USA -] cohort study**, the number of inpatients who received NRT after the smoking ban compared with the period 6 weeks before the local (hospital's) smokefree buildings policy was higher both during the 6-week period immediately after implementation of the policy and for the 1993 follow up (F=8.09, df=2,106, p<0.001).

In **Erwin's 1991 [USA -] interrupted time series**, there was a decline in nursing staff reporting that they had encouraged inpatients to participate in smoking cessation groups from 80% and 100% (Wards A and B) 1 week post-implementation to 60% and 50% (Wards A and B) 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated).

In **Patten's 1995 [USA +] uncontrolled before and after study** examining hospital chart data, there was no change in the number of inpatient consultations to the Nicotine Dependence Centre between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy. Thirteen inpatients attended the Centre's weekly support group.

Other Impacts on Patients: Inpatient Prescriptions For or Use of NRT (Mental Healthcare)

Evidence statement 3.12: Impact of smokefree legislation on patient use of smoking cessation support in a mental healthcare setting
There is evidence from three before and after studies, one in the UK (**Cormac 2010 [+])**, one in Switzerland **(Etter 2008 [+])** and one in the USA **(Patten 1995 [+]**), one interrupted time series in the USA (**Erwin 1991 [-]**) and one cohort study in the USA (**Velasco 1996 [-]**) about the impact of smokefree legislation on inpatient use of smoking cessation support in a **mental healthcare setting.**

UK Applicability: Evidence comes from one recent UK study but mostly from outside the UK. However the policy covered in most of the studies (indoor smokefree) is already national legislation in the UK, however the one study's policy is for smokefree grounds and buildings (a policy implemented in parts of the UK). There is no reason to believe the effect is not applicable to the UK setting.

There is **moderate** evidence from two before and after studies, one in the UK (**Cormac 2010 [+]** and one in Switzerland **(Etter 2008 [+]**), and one cohort study in the USA (**Velasco 1996 [-]**) that the introduction of smokefree, particularly when including cessation support and pharmacotherapy as supporting strategies, increases the amount of NRT dispensed or received by inpatients. There is **inconsistent** evidence from two before and after studies, one in Switzerland (**Etter 2008 [+]** and one in the USA **(Patten 1995 [+]**), and one interrupted time series in the USA (**Erwin 1991 [-]**) on the impact of smokefree on inpatient use of cessation support during hospitalisation.

One before and after study in the UK (**Cormac 2010 [+]**) reported an increase in inpatients who commenced NRT after implementation of the national indoor smokefree legislation in England and a local (NHS Trust's) smokefree grounds policy (no further details are reported). ***Supporting strategies*** *were pharmacotherapy, cessation support, staff training and patient surrender of smoking materials.*

From 2 years pre- to 1 year post-implementation of a local (hospital administration's) smokefree buildings policy, **Etter 2008 [+]** in Switzerland reported a significant increase in the inpatients who smoked reporting that during their current stay a physician or nurse provided medication (like a patch, gum or Zyban) to quit smoking ($p<0.001$), no significant change in those reporting that staff advised them to quit smoking ($p=0.006$) or helped them to quit smoking ($p=0.015$). Staff reported that the proportion of inpatients to whom NRT was provided significantly increased 2 years pre- to 1 year post implementation ($p<0.001$, OR 4.0, 95% CI 1.6-9.9) and the proportion of inpatients to whom help was provided to quit smoking significantly increased from 1 year pre- to 1 year post-implementation ($p=0.007$, OR 3.8, 95% CI 1.6-9.3). ***Supporting strategies*** *included signage, cessation support, pharmacotherapies, closure of smoking rooms and staff training*.

One interrupted time series in the USA (**Erwin 1991 [-]**) reported a decline in nursing staff reporting that they had encouraged inpatients to participate in smoking cessation groups, between 1 week post-implementation and 4 weeks post-implementation of a local (US Department of Veterans Affairs) smokefree buildings policy (no p values calculated). ***Supporting strategies*** *were based*

around nursing interventions, including encouraging patients to participate in smoking cessation groups and addressing patients with the urge to smoke.

In the USA, **Patten 1995 [+]** reported no change in the number of inpatient consultations to the Nicotine Dependence Centre between 3 months pre- and 3 months post-implementation of a local (hospital board's) smokefree buildings and smokefree grounds policy. ***Supporting strategies*** *included an implementation committee, weekly patient cessation support groups, pharmacotherapies, written information for patients and staff education sessions on the treatment of nicotine dependence*.

In the USA, **Velasco 1996 [-]** reported that the number of inpatients who received NRT during the 6-week period immediately after implementation of local (hospital's) smokefree buildings policy in 1991 and during the 1993 follow up was significantly higher than in the 6-week period before implementation ($p<0.001$). ***The supporting strategy*** *was that patients were notified of the indoor smoking ban prior to admission.*

3.3.1.9 Other Health Impacts on Patients (Mental Healthcare)

Inpatient Sick Calls (Mental Healthcare)

One before and after study reported outcomes relating to the impact of local policy implementation of smokefree buildings and grounds with supporting strategies on outcomes related to a visit of the patient by the medical doctor for a physical complaint (inpatient sick calls) in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). There was a decline in adverse effects from local-level smokefree policy implementation.

Hempel's 2002 [USA +] before and after study assessed the same sample of forensic patients 4 weeks prior to, and 4 weeks after implementation of a local (hospital board's) smokefree (campus) buildings and smokefree grounds policy. There was a significant 54% post-implementation decline in sick calls for moderate smokers (10-18 cigarettes/day) ($p=0.038$) and a significant 61% post-implementation decline in sick calls for heavy smokers (≥19 cigarettes/day) ($p=0.008$). There were no significant changes for non-smokers and light smokers (1-9 cigarettes/day).

Inpatient Acuity Level (Mental Healthcare)

One cohort study reported outcomes relating to the impact of local policy implementation of smokefree buildings with supporting strategies on outcomes related to patient acuity levels (intensive nursing requirements) in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). There was a decline in adverse effects from local-level smokefree policy implementation.

Rauter's 1997 [USA +] cohort study found that the average inpatient monthly acuity level (from one, most acute, to five, ready for discharge as recorded daily by nurses) for the period before implementation of a local (hospital's) smokefree buildings policy was significantly lower than the average level for the first 9 months of the ban (2.62 and 2.74 respectively, $t=2.57$, $p=0.03$).

Inpatient Seizure Rates (Mental Healthcare)

One before and after study reported outcomes relating to the impact of local policy implementation of smokefree buildings with supporting strategies on outcomes related to seizure rates in inpatients in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). There was a no change in adverse effects from local-level smokefree policy implementation.

In an **uncontrolled before and after study, Rees 2008 [USA +]** reported a non-significant decrease in inpatient seizure rates from 0.58% per year to 0.18% per year between the 12 months before and 12 months after implementation of a local (university hospital's) smokefree buildings policy in its inpatient medical detoxification unit.

Other Health Impacts on Patients (Mental Healthcare)

Inpatient Sick Calls (Mental Healthcare)
Inpatient Acuity Level (Mental Healthcare)
Inpatient Seizure Rates (Mental Healthcare)

Evidence statement 3.13: There is **weak** evidence from one before and after study in the USA (**Hempel 2002 [+]**) that implementation of a local smokefree buildings and smokefree grounds policy with supporting strategies results in a decline in the number of inpatient sick calls (for a physical complaint) for moderate and heavy smokers immediately following implementation in a mental healthcare setting.

UK Applicability: This evidence was conducted outside the UK, however the policy covers smokefree grounds (a policy implemented in parts of the UK) and there is no reason to believe the effect is not applicable to the UK setting.

In the USA, **Hempel 2002 [+]** reported a significant post-implementation decline in inpatient sick calls for moderate smokers (10-18 cigs/day) (p=0.038) and for heavy smokers ((≥19 cigs/day) (p=0.008) 4 weeks after policy implementation compared with 4 weeks prior to implementation. There were no significant changes for non-smokers and light smokers (1-9 cigs/day). ***Supporting strategies*** *included education for staff about potential withdrawal symptoms, and any tobacco products found on patients were seized.*

Evidence statement 3.14: There is **weak** evidence from one cohort study in the USA (**Rauter 1997 [+]**) that implementation of a local (hospital's) smokefree buildings policy with supporting strategies significantly decreases mean inpatient acuity levels, as recorded daily by nurses, between the pre-implementation period and 9 months post-implementation in a mental healthcare setting (p=0.03). ***Supporting strategies*** *included smoking reduction workshops and patients wishing to participate were urged to do so.*

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the effect is not applicable to the UK setting.

Evidence statement 3.15: There is **weak** evidence from one before and after study in the USA (**Rees 2008 [+]**) that a local (university hospital's) smokefree buildings policy in its inpatient medical detoxification unit with supporting strategies does not significantly change inpatient seizure rates in a mental healthcare setting, when seizure rates were measured during the 12 months before and 12 months after implementation. ***The supporting strategy*** *was that patients were informed of the indoor smoking ban as part of their admission screening process.*

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. However there is no reason to believe the effect is not applicable to the UK setting.

3.3.2 Other Consequences from Smokefree for Staff (Mental Healthcare)

This section has one measured outcome: staff absenteeism.

3.3.2.1 Staff Absenteeism

One before and after study reports outcomes relating to the impact of local policy implementation of smokefree buildings with supporting strategies on outcomes related to staff absenteeism in mental healthcare settings (see study descriptions in Figure 3.3 and Table 2.1 above). There was no change in effects from local-level smokefree policy implementation.

In an **uncontrolled before and after study (with different sample) (Matthews 2005 [USA -])**, no significant differences were found in the 3 months before and 3 months after the local (hospital's) smokefree buildings policy was implemented related to the number of callouts (i.e. scheduled staff not coming in for their shift at the acute crisis stabilization unit). Pre-implementation 36/252 shifts reported at least one callout and post-implementation 38/252 shifts reported at least one callout.

Other Impacts on Staff: Staff Absenteeism

Evidence statement 3.16: There is **weak** evidence from one before and after study in the USA (**Matthews 2005 [-]**) that implementation of a local (hospital's) smokefree buildings policy with supporting strategies has no significant effect on staff absenteeism in a mental healthcare setting.

In the USA, **Matthews 2005 [-]** reported no significant differences in staff absenteeism between the 3 months before and 3 months after the local (hospital's) smokefree buildings policy was implemented. ***Supporting strategies*** *included patient education about nicotine addiction and withdrawal and pharmacotherapies.*

UK Applicability: This evidence was conducted outside the UK and the policy covered (indoor smokefree) is already national legislation in the UK. It is unlikely to be applicable.

4. Discussion

4.1 Background

The current situation in England and Wales is that all indoor spaces in secondary care settings, including mental health and acute settings, are required to be smokefree (as of the 2007 legislation). There is no legislative requirement for smokefree grounds in England and Wales, although some individual institutions and Trusts such as Nottingham Healthcare Trust and Addenbrooke's Hospital in Cambridgeshire have introduced and trialled policies requiring smokefree grounds. A similar situation exists in Scotland where legislation banning smoking in enclosed public places came into force in 2006. However, psychiatric facilities are one of the few settings exempted by the legislation in Scotland.

This effectiveness review uses the World Health Organization's FTCT definition of smokefree as "air that is 100% smoke free. This definition includes, but is not limited to, air in which tobacco smoke cannot be seen, smelled, sensed or measured" (FTCT, 2008). The primary intention of smokefree policies and legislation is to protect non-smokers and smokers from second-hand smoke (SHS). Non-smokers (and smokers) can become exposed to SHS when they breathe this contaminated air (IARC, 2009). As contaminants from SHS can be absorbed (and later released) by materials in the environment (e.g. furniture coverings, curtains), the potential for SHS exposure lasts considerably longer than the act of smoking. There has been no safe level of SHS exposure identified.

Other potential consequences from the introduction of smokefree can be either positive or negative. Potential adverse consequences include: patients signing out against medical advice, a decrease in hospital utilisation, employees resigning, an increase in patient disruptive behaviours; while examples of potential beneficial consequences include: staff and patient quitting smoking, related health improvements; a decrease in patient disruptive behaviour and an improved working environment and healthful image of the hospital.

Recent cross-sectional studies conducted in English secondary care settings after the implementation of the (indoor) smokefree legislation with supporting strategies, have found restricted compliance in both settings of interest. In acute and maternity settings:

- Eighty-three per cent of surveyed representatives from English NHS Acute Trusts indicated 'at least daily' or 'at least weekly' reported and observed smokefree policy infringements at their institution (Ratschen et al., 2008). Observation data from acute site visits observed patients and visitors smoking in the grounds at 94% of sites and (identifiable) staff smokers at 35% (Ratschen et al., 2008).
- Sixty per cent of healthcare (medical and nursing) staff at an NHS hospital in Tyne and Wear reported awareness of other members of staff smoking on site seven months after smokefree site implementation (Shipley and Alcock, 2008). In terms of challenging smokers on the hospital site to comply with its smokefree policy, there was a trend towards hospital staff being more likely to have challenged patients smoking (25%) over visitors (13%) and over other staff (8%) smoking on site; and a trend towards never smokers staff stating they had challenged others smoking on the hospital site more often than ever smokers and current smokers staff.

In mental healthcare settings:

- Fifty per cent of surveyed representatives from English NHS mental health settings indicated 'at least daily' or 'at least weekly' reported and observed smokefree policy infringements at their institution (Ratschen et al., 2008).
- When surveyed four months after the introduction of smokefree legislation, 13% of staff surveyed at a medium secure psychiatric unit in West Yorkshire reported filling in an incident form if a patient violated the smoking ban. However, 51% of staff said they would not fill in an incident form (Garg et al., 2009).
- At a city mental health hospital in the Midlands, 59% of nursing staff agreed with the statement "The non-smoking policy causes secret smoking during work hours" (Bloor et al., 2006) and 94% of the nursing staff surveyed reported that they continued to smoke at work since the introduction of the smokefree policy.

Strategies and interventions to enhance the implementation of and compliance with smokefree are therefore important.

4.2 Findings

This review of the effectiveness of smokefree legislation in secondary healthcare settings comprises a relatively small body of evidence. Twenty-seven studies were identified, of which only one was a randomised controlled trial (Kempf 1996 [USA +]), the remainder were quantitative observational studies. Only two studies evaluated the effectiveness of a supporting strategy in ensuring compliance with smokefree legislation (Nagle 1996 [Australia +], Erwin 1991 [USA -]). The majority of studies were conducted in the USA, with only two conducted in a UK setting (Cormac 2010 [UK +], Shetty 2010 [UK +]) and a small number in Europe and the rest of the world. Around half of the studies were published before 2000. The methodological quality of studies varied from 'low' to 'moderate', with most rated as 'moderate'. The review presents 34 evidence statements.

The review of the evidence relating to implementation of outdoor smokefree policies and strategies identified a number of important findings:

- Examination of proxy indicators of compliance appear to show that smokefree legislation can be effective. Few studies showed a decrease in 'compliance', although one study (Nagle 1996 [Australia +]) found a *decrease* in compliance in its evaluation of the effectiveness of the introduction of 'No Smoking Outdoors' signs.
- The review is unable to provide conclusive evidence of the effectiveness of the impact of different supporting strategies. However, all but one of the studies described some level of support as part of the implementation process. An overall review of the findings suggests that there is no general pattern between the number (some studies reported on one, others multiple) and type of supporting strategies (some were structural changes, others education or information provisions, and others related to cessation) and overall effectiveness at sustaining compliance with the policy or legislation. One supporting strategy, the provision of NRT to patients or staff (used in 13 studies), was also a measured 'other consequence' of smokefree implementation ('Patient NRT Prescriptions and NRT Use', i.e. the changes in prescription and use before and after implementation) but nothing conclusive can be attributed to the strategy.
- Findings in mental health settings identified a number of concerns related to adverse consequences, including the need to monitor drug levels, increased abuse and aggression and increased discharges against medial advice. However, the review has shown that in most cases these detrimental effects were not realised. These findings are consistent with those found by Lawn and Pols (2005) in their review of effectiveness of smoking bans in inpatient psychiatric services. They found no increase in aggression, use of seclusion,

discharge against medical advice or increased use of PRN medication in most studies following smokefree implementation. Similarly, El-Guebaly et al.'s (2002) review of total and partial smoking bans in inpatient psychiatric or addiction settings (which included studies from 1987 to 2000) concluded that the evidence "suggests that policies that ban smoking have no major long-standing untoward effects in terms of the behavioral indicators of unrest or noncompliance" (p. 1621). However, as there is an absence of strong data on compliance it is not possible to confirm if these measures are true reflections, or just indicative.

- Similar patterns emerged from those studies conducted in acute and maternity settings. The largest positive effects appear to be in relation to staff smoking behaviour, with fewer negative effects found. However, as with studies conducted in mental health settings the lack of reliable compliance data makes verification of these effects difficult.

4. 3 Applicability to UK

Although much of the available evidence on effectiveness is relatively recently, there is limited evidence from the UK, which limits the review's applicability. However, all the included studies were conducted in similar high income countries.

In addition, there was also judged to be relatively strong applicability in terms of smokefree policy. Six studies in acute and maternity settings and seven studies in mental health settings examined the effects of smokefree grounds or smokefree grounds and buildings policies. The rest examined the effects of smokefree indoor policies or legislation; the same level as the current smokefree legislation requirements of the UK.

Like the studies conducted in England (Cormac 2010 +, Shetty 2010 +), studies conducted in both France (Vorspan 2009 +) and Spain (Fernandez 2008 +, Martinez 2008 +) had national indoor smokefree legislation as the impetus for smokefree. Israel brought in national legislation after Donchin's 2004 [+] study conducted, while the Australian study (Nagle 1996 +) had state-wide indoor smokefree legislation as its impetus. All of the other studies were based on localised policies, mostly localised to hospitals, but some to wider regions or provinces. Both of the UK studies (Cormac 2010 +, Shetty 2010 +) also implemented local smokefree grounds/campus policies, reportedly because Nottinghamshire Healthcare NHS Trust brought in their regional policy in 2007.

All studies identified relating to the use of restraints in mental healthcare settings were conducted in the USA, however the use of mechanical or physical restraints in the UK is not a first-line response and so this evidence has particularly limited generalizability to the UK.

In UK mental health settings, smoking outdoors, but within the grounds of a hospital or facility, may not be a feasible option due to the nature of the hospital estate in terms of safe access for an inpatient or others to an outdoors smoking space; or whether it is appropriate for the patient to leave the ward at particular times, or at all. It was often unclear in the included studies in mental healthcare settings with only indoor smokefree policies or legislation in place (n=9 studies), all non-UK, whether inpatients were escorted to outdoor areas to smoke or whether outdoor smoking areas were secure or enclosed for detained patients. One study in a hospital psychiatric department in Switzerland (Etter 2008 +) stated that inpatients, except those in locked rooms, were allowed to leave the unit to smoke outside and that after the total ban some patients left the clinic to go out and buy cigarettes. No further details were given for those in locked rooms in the article. Another European study in a hospital psychiatry department in France (Vorspan 2009 +) reported that patients were evaluated for outdoor smoking breaks, ranging from none, limited and accompanied by a nurse, to unlimited. Finally, a USA study in a public inpatient psychiatric hospital (Rauter 1997 +), described the establishment of open-air smoking areas outside the buildings. Only one study in

the USA (Velasco 1996 -) described its setting as a secure ("locked") inpatient psychiatric service, but no further details were provided.

Included studies in mental healthcare settings with smokefree grounds policies or legislation in place (n=7 studies) rarely described whether inpatients left campus to smoke or were escorted off-campus to allow them to smoke. Two studies, one in a "medium secure unit" in the UK (Shetty 2010 +) and one in a "locked adult inpatient psychiatric unit" in the USA (Patten 1995 +), described smokefree as unenforceable for inpatients with unescorted community leave (the former study) and for inpatients with off-unit privileges who were granted brief passes to leave the building unaccompanied to smoke (the latter study).

4.4 Limitations and Gaps in the Evidence

A number of gaps and limitations in the evidence were identified:

- As already noted, the evidence from the UK, although recent, is extremely limited.
- There is no strong evidence from well-conducted trials, and there were limitations in the available evidence concerning which strategies best support compliance with smokefree policy. As a result, there are limitations to the advice that the review can give in this area. Of the two relevant studies, Erwin 1991 [USA -] was judged to be highly subjective and had a comparatively small sample, while Nagle 1996 [Australia +] found compliance to decrease post-implementation. The available evidence is further hindered by the way in which compliance with smokefree polices was assessed with few studies using objective outcome measures.
- Few studies directly answered the main research question to assess the effectiveness of support strategies. Most studies were designed to evaluate overall effect. Or, as one study (Gadomski et al., 2010) noted, the impact of the individual support strategies in their intervention, which included an inpatient cessation programme, staff education and an implantation plan could not be evaluated as "they were intentionally implemented simultaneously in order to achieve a synergistic effect" (p.53).
- While description of the smokefree supporting strategy was an inclusion criteria for this review, few studies reported in detail the individual supporting strategies used, the main exception to this being Kvern 2006, which was an evaluation report with no apparent word count limitations. Given these inclusion criteria it should be noted that this review does not address wider questions concerning the effectiveness of smokefree policy.
- Only one of the studies identified by the review used an experimental design. The remainder were observational studies, only one of which had a concurrent control group.
- There was a clear difference between study populations in the two review settings: studies in mental health settings tended to report on patient outcomes, and those in acute and maternity settings tended to report on staff outcomes. Outcomes relating to compliance with smokefree or other consequences of smokefree were limited for visitors, friends and relatives of inpatients in both settings.

5. References

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5.2 Review 6 Included Studies

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Component 3 Smokefree Secondary Care Settings

Review 6

APPENDICES

Draft 4 - 16th July 2013

November 2021: NICE guidelines PH45 (June 2013) and PH48 (November 2013) have been updated and replaced by NG209.
The recommendations labelled [2013] or [2013, amended 2021] in the updated guideline were based on these evidence reviews.
See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

APPENDIX 1: Summary of Included Study Countries' Smokefree Status

Country States/Provinces	**Public places with complete <u>national</u> indoor smokefree legislation for Health-Care Facilities at 31st December 2008**[1]	**Public places with complete <u>subnational</u> indoor smokefree legislation for Health-Care Facilities at 31st December 2008**[11]	**Additional Information (from Review 6 and Review 7's included papers)**
Australia	**No**		
Australian Capital Territory, New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria, Western Australia		Yes (all)	• **New South Wales State**: legislation introduced in 1988 which required a total prohibition of smoking by all staff, patients and visitors in all hospital buildings and vehicles **(Nagle, 1996)**. • **Queensland State**: As of 2005, there was no formal policy regarding smoking in any acute mental health unit in the State **(Campion 2008)**. • **South Australia State**: Smoking banned inside hospitals in the State 'for many years' but smoking has been allowed outdoors either in defined areas or alternatively, areas where smoking is banned are defined **(Jones, 2010)**.
Canada	**No**		
Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Northwest Territories, Nova Scotia, Nunavut, Ontario, Prince Edward Island, Quebec,		Yes (all)	• **Ontario Province**: *Tobacco Control Act 1994* banned smoking in all government buildings. Large psychiatric facilities sought and received special dispensation from the Provincial Ministry of Health and Long Term Care to allow patients and some staff to smoke in specially ventilated rooms **(Parle, 2004)**. The *Smoke-Free Ontario Act* (enacted May 31st 2006) prohibits smoking in all enclosed workplaces and public places in Ontario. All long-term and residential care facilities, including psychiatric facilities, are exempted from this legislation and are permitted to provide controlled designated smoking rooms to allow residents, but not staff, to smoke **(Voci, 2010)**.

[1] **Data Source:** World Health Organization (2009). *WHO Report on the Global Tobacco Epidemic, 2009: Implementing smoke-free environments*. Geneva: World Health Organization. http://whqlibdoc.who.int/publications/2009/9789241563918_eng_full.pdf. [WHO defines "indoor smokefree" as "Smoking is not allowed at any time in any indoor area under any circumstances"]

Saskatchewan, Yukon			• **Calgary City**: Calgary Health Region (CHR) went entirely smokefree on May 31st 2002, banning tobacco use indoors as well as on all CHR-owned property. It was the first health region in Canada to do so **(Patterson, 2008)**.
France	**Yes**		• General smoking ban in public places occurred in France in 2007 **(Vorspan, 2009).**
Israel	**Yes**		• 2001 anti-smoking law completely banned smoking in all hospitals in Israel **(Donchin, 2004)**.
Spain	**Yes**		• After the ratification of the *Framework Convention on Tobacco Control* in January 2005, Spain enacted a comprehensive regulation to prevent and control smoking on January 1st 2006. The regulation restricted the selling, advertising, and using tobacco in public places, workplaces and hospitals. Smoking was banned in any location within hospitals and health care buildings, eliminating smoking rooms, smokers' cafeterias and smokers' areas within cafeterias (**Fernández 2008; Martínez 2008)**.
Switzerland	**No**		
Ticino		Yes	
UK	**Yes**		

England , Northern Ireland, Scotland , Wales		Yes (all)	**England and Wales**: • The *National Service Framework for Coronary Heart Disease* required that by April 2001, all NHS bodies, in collaboration with Local Authorities, must have implemented a smoking policy **(Arack, 2009; Bloor, 2006)**. • The 2004 Department of Health White Paper *Choosing Health: Making Healthier Choices Easier* made a commitment to a smokefree NHS by the end of 2006 **(Arack, 2009; Parks, 2009; Praveen, 2009)**. • The *Health Act 2006* banned smoking in all enclosed or substantially enclosed public places and workplaces, including health care facilities from July 1st 2007 **(Arack, 2009; Cormac, 2010; Garg, 2009; Parks, 2009; Praveen, 2009; Pritchard, 2008; Smith, 2008; Ratschen, 2008)**. Mental health facilities were granted a temporary exemption for one year during which time designated smoking rooms meeting specified requirements were permitted **(Hill, 2007; Praveen, 2009; Pritchard, 2008; Smith, 2008)**. From July 1st 2008 smoking was banned in any enclosed or substantially enclosed part of mental health establishments **(Hill, 2007; Mental Health Foundation, 2009; Pritchard, 2008; Smith, 2008).** **Scotland** • Legislation banning smoking in enclosed public places came into force in 2006. Psychiatric facilities were one of the few settings exempt from the ban **(HUG, 2007; McNeill, 2007)**

USA	**No**		• In December 1988, officials of the United States Department of Veterans Affairs (VA) announced the goal of establishing smoke-free VA acute care facilities by mid-1989. Psychiatric facilities were excluded from this proclamation **(Erwin, 1991)**. • In May 1988 the Surgeon General and the Medicare Administrator sent letters to 7,000 Medicare hospitals asking for action to establish smokefree environments in their facilities **(Baile, 1991)**. • A bill requiring all hospitals participating in Federal Health Programs to adopt no-smoking policies was introduced in Congress in the late 1980s, but the bill was defeated **(Baile, 1991)**. • The Joint Commission on the Accreditation of HealthCare Organizations (JCAHO) declared that all accredited hospitals in the USA must be smokefree as of January 1992 **(Haller, 1996; Ryabik, 1995; Velasco, 1996)**. • Effective December 31st 1993, the JCAHO introduced indoor restrictions on smoking as a quality indicator **(Sheffer, 2009)**. • The JCAHO required all hospitals in the USA to be smokefree from January 1st 1994 **(Stillman, 1995).**
Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Hawaii, Idaho, Illinois, Iowa, Maryland, Massachusetts, Minnesota, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Utah, Washington, Wisconsin		Yes	

California, Florida, Georgia, Kansas, Louisiana, Maine, Michigan, Mississippi, Missouri, North Carolina, Oklahoma, Vermont, Virginia, West Virginia		No	
Alabama, Indiana, Kentucky, South Carolina, Texas, Wyoming		Not reported by WHO	

APPENDIX 2: Sample database search strategies for Smokefree strategies and interventions in secondary care settings (Reviews 6 &7)

MEDLINE (includes Medline in Process)
Database host: EBSCO Host
Search date: 7/2/2012
Number of records: 4269

#	Query
S29	S25 NOT S28 Limiters - Date of Publication from: 19900101-20121231
S28	S27 NOT S26
S27	(MH "Animals")
S26	(MH "Animals") AND (MH "HUMANS")
S25	S23 or S24
S24	((S18 OR S19) AND S17)
S23	(S22 AND S16)
S22	(S18 or S19 or S20 or S21)
S21	TI ("acute care" OR "acute service#" OR "acute setting#" OR "acute trust#" OR "ambulance#" OR "health centre#" OR "care centre#" OR "health center#" OR "care center#" OR "inhospital" OR "national health service" OR "national health services" OR "secondary care" OR accident OR (acute N2 department#) OR "acute unit#" OR emergency OR "health authorities" OR "health board#" OR "clinical care" OR "clinical unit#" OR "care facilities" OR "care facility" OR "care unit#" OR "care trust" OR "elective care" OR "medical care" OR "health service#" OR "health system#" OR "health trust#" OR "health unit#" OR "healthcare unit#" OR "heath authority" OR hospice# OR hospitalised OR hospitalized OR hospital OR hospitals OR maternity OR prenatal OR perinatal OR antenatal OR obstetric# OR inpatient# OR "prison healthcare" OR "prison health" OR "NHS Trust#" OR outpatient# OR patient# OR psychiatric OR PCTs OR "mental health*" OR (secure W3 unit#) OR surgery OR "residential care" OR "long term care" OR "specialist unit#" OR "specialist care" OR "speciality care" OR "staff residence" OR "staff residency" OR "staff residencies" OR "staff accommodation" OR ward#)
S20	AB ("acute care" OR "acute service#" OR "acute setting#" OR "acute trust#" OR "ambulance#" OR "health centre#" OR "care centre#" OR "health center#" OR "care center#" OR "inhospital" OR "national health service" OR "national health services" OR "secondary care" OR accident OR (acute N2 department#) OR "acute unit#" OR emergency OR "health authorities" OR "health board#" OR "clinical care" OR "clinical unit#" OR "care facilities" OR "care facility" OR "care unit#" OR "care trust" OR "elective care" OR "medical care" OR "health service#" OR "health system#" OR "health trust#" OR "health unit#" OR "healthcare unit#" OR "heath authority" OR hospice# OR hospitalised OR hospitalized OR hospital OR hospitals OR maternity OR prenatal OR perinatal OR antenatal OR obstetric# OR inpatient# OR "prison healthcare" OR "prison health" OR "NHS Trust#" OR outpatient# OR patient# OR psychiatric OR PCTs OR "mental health*" OR (secure W3 unit#) OR surgery OR "residential care" OR "long term care" OR "specialist unit#" OR "specialist care" OR "speciality care" OR "staff residence" OR "staff residency" OR "staff residencies" OR "staff accommodation" OR ward#)
S19	(MH "Administrative Personnel") OR (MH "Adolescent, Hospitalized") OR (MH "Cancer Care Facilities") OR (MH "Cardiac Care Facilities") OR (MH "Child, Hospitalized") OR (MH "Emergency Medical Services") OR (MH "Emergency Service, Hospital+") OR (MH "Home Care Services") OR (MH "Home Care Services, Hospital-Based") OR (MH "Hospices") OR (MH "Hospital Administration") OR (MH "Hospital Administrators") OR (MH "Hospital Communication Systems") OR (MH "Hospital Design and Construction") OR (MH "Hospital Units+") OR (MH "Hospitalization+") OR (MH "Hospitals, Chronic Disease") OR (MH "Hospitals, Community") OR (MH "Hospitals, Convalescent") OR (MH "Hospitals, County") OR (MH "Hospitals, District") OR (MH "Hospitals, Federal") OR (MH "Hospitals, General") OR (MH "Hospitals, Isolation") OR (MH "Hospitals, Maternity") OR (MH "Hospitals, Municipal") OR (MH "Hospitals, Osteopathic") OR (MH "Hospitals, Pediatric") OR (MH "Hospitals, Private") OR (MH "Hospitals, Proprietary") OR (MH "Hospitals, Psychiatric") OR (MH "Hospitals, Public") OR (MH "Hospitals, Religious") OR (MH "Hospitals, Rural") OR (MH "Hospitals, Satellite") OR (MH "Hospitals, Special") OR (MH "Hospitals, State") OR (MH "Hospitals, Teaching") OR (MH "Hospitals, University") OR (MH "Hospitals,

	Urban") OR (MH "Hospitals, Voluntary") OR (MH "Hospitals+") OR (MH "Inpatients") OR (MH "Legislation, Hospital") OR (MH "Maintenance and Engineering, Hospital") OR (MH "Maternal Health Services+") OR (MH "Medical Staff, Hospital") OR (MH "Nurse-Patient Relations") OR (MH "Nursing Staff, Hospital") OR (MH "Obstetrics and Gynecology Department, Hospital") OR (MH "Outpatient Clinics, Hospital+") OR (MH "Outpatients") OR (MH "Patient Acceptance of Health Care") OR (MH "Patient Admission") OR (MH "Patient Advocacy") OR (MH "Patient Compliance") OR (MH "Patients") OR (MH "Personnel, Hospital") OR (MH "Physician-Patient Relations") OR (MH "Psychiatric Department, Hospital") OR (MH "Psychiatric Nursing") OR (MH "Surgicenters") OR (MH "Visitors to Patients")
S18	(MH "Health Facilities+") OR (MH "Health Facility Administration+") OR (MH "Health Facility Environment+")
S17	(MH "Smoking/PC") OR (MH "Tobacco Use Disorder/PC") OR (MH"Tobacco Use Cessation")
S16	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S15
S15	((S13 OR S14) AND S12)
S14	TI (smoking OR tobacco OR cigarette# OR smokers OR smoke OR nonsmoking OR nonsmokers) OR AB (smoking OR tobacco OR cigarette# OR smokers OR smoke OR nonsmoking OR nonsmokers)
S13	(MH "Smoking") OR (MH "Smoking Cessation") OR (MH "Tobacco Use Disorder") OR (MH"Tobacco Use Cessation")
S12	(MH "Social Control Policies") OR (MH "Social Control, Formal") OR (MH "Legislation as Topic") OR (MH "Legislation, Hospital") OR (MH "Organizational Policy") OR (MH "Public Policy") OR (MH "Health Policy")
S11	(MH "Tobacco Smoke Pollution/LJ") OR (MH "Tobacco Smoke Pollution/PC") OR (MH "Smoking/LJ") OR (MH "Smoking Cessation/LJ")
S10	(TI ((bans OR ban OR banning OR restrict* OR prohibit* OR sanction# OR eliminat* OR remov* OR restrict* OR eradicat* OR sanction* OR curbs OR curb OR curbing OR enforce# OR enforcing OR control* OR prevent*)) N3 (("second hand" N1 smok*) OR (secondhand N1 smok*) OR (passive N1 smok*) OR (environmental N2 smoke) OR "involuntary smoking" OR (pollution N2 tobacco) OR (pollution N2 cigarette#))) OR (AB ((bans OR ban OR banning OR restrict* OR prohibit* OR sanction# OR eliminat* OR remov* OR restrict* OR eradicat* OR sanction* OR curbs OR curb OR curbing OR enforce# OR enforcing OR control* OR prevent*)) N3 (("second hand" N1 smok*) OR (secondhand N1 smok*) OR (passive N1 smok*) OR (environmental N2 smoke) OR "involuntary smoking" OR (pollution N2 tobacco) OR (pollution N2 cigarette#)))
S9	AB ((workplace# OR place# OR zone# OR space# OR facility OR facilities OR area# OR location# OR premises OR propert* OR site# OR building# OR campus* OR ground# OR establishment# OR room# OR shelter# OR environment# OR enclos* OR hospital#) N1 ("non smoking" OR nonsmoking)) OR (AB (smoking OR "smoking break#" OR smoke OR smoker#) N1 (place# OR zone# OR space# OR facility OR facilities OR area# OR location# OR premises OR building# OR room# OR shelter# OR site# OR enclos*))
S8	TI ((workplace# OR place# OR zone# OR space# OR facility OR facilities OR area# OR location# OR premises OR propert* OR site# OR building# OR campus* OR ground# OR establishment# OR room# OR shelter# OR environment# OR enclos* OR hospital#) N1 ("non smoking" OR nonsmoking)) OR (TI (smoking OR "smoking break#" OR smoke OR smoker#) N1 (place# OR zone# OR space# OR facility OR facilities OR area# OR location# OR premises OR building# OR room# OR shelter# OR site# OR enclos*))
S7	(TI ("tobacco control#" OR "cigarette# control#" OR "smoking control#" OR ("control tobacco" OR "control cigarette#" OR "control smoking"))) OR (TI ("control* tobacco" OR "control* cigarette#" OR "control* smoking")) OR (TI ("smoking break#" OR smoke) N2 (control* OR prevent OR preventing OR prevents OR prevention)) OR (TI (tobacco OR cigarette# OR smoking) N2 (prevent OR preventing OR prevents OR prevention)) OR (AB ("tobacco control#" OR "cigarette# control#" OR "smoking control#" OR ("control tobacco" OR "control cigarette#" OR "control smoking"))) OR (AB ("control* tobacco" OR "control* cigarette#" OR "control* smoking")) OR (AB ("smoking break#" OR smoke) N2 (control* OR prevent OR preventing OR prevents OR prevention)) OR (AB (tobacco OR cigarette# OR smoking) N2 (prevent OR preventing OR prevents OR prevention))
S6	TI ((smoking OR tobacco OR cigarette# OR smokers OR "smoking break#" OR smoke) N3 (bans OR ban OR banning OR restrict* OR prohibit* OR eliminat* OR remov* OR restrict* OR eradicat* OR sanction* OR curbs OR curb OR curbing OR enforce# OR enforcing)) OR AB ((smoking OR tobacco OR cigarette# OR smokers OR "smoking break#" OR smoke) N3 (bans OR ban OR banning OR restrict* OR prohibit* OR eliminat* OR remov* OR restrict* OR eradicat* OR sanction* OR curbs OR curb OR curbing OR enforce# OR enforcing))
S5	TI ((act or acts or policy OR policies OR rule# OR "hospital guideline#" OR law# OR regulation# OR rules

	OR rule OR ordinance# OR legislat* OR code# OR compliance) N3 (smoking OR tobacco OR cigarette# OR smokers OR nonsmoking OR nonsmokers OR smoke)) OR AB ((act or acts or policy OR policies OR rule# OR law# OR regulation# OR rules OR rule OR "hospital guideline#" OR ordinance# OR legislat* OR code# OR compliance) N3 (smoking OR tobacco OR cigarette# OR smokers OR nonsmoking OR nonsmokers OR smoke))
S4	TI ("no smoking" OR antitobacco OR "anti tobacco" OR "antismoking" OR "anti smoking") OR AB ("no smoking" OR antitobacco OR "anti tobacco" OR "antismoking" OR "anti smoking")
S3	TI ("end smoking") OR TI ("ending smoking") OR AB (("end smoking") OR ("ending smoking"))
S2	TI ((tobacco W2 free) OR (cigarette W2 free)) OR AB ((tobacco W2 free) OR (cigarette W2 free))
S1	TI ("smoke free" OR "smoking free" OR smokefree) OR AB ("smoke free" OR "smoking free" OR smokefree)

Trials Register of Promoting Health Interventions (TRoPHI)

Database host: EPPI-Centre
Database coverage dates: 2005-current
Search date: 14/2/2012
Number of records retrieved: 126

344 Focus of the report: tobacco 823
345 Type(s) of intervention: environmental modification OR legislation OR regulation 387
346 344 AND 345 49
347 Freetext (item record) smokefree 3
351 Freetext (item record) antitobacco 1
352 Freetext (item record) antismoking 16
353 Freetext (item record) "anti smoking" 17
354 Freetext (item record) "anti tobacco" 5
355 Freetext (item record) "smoke free" 23
356 Freetext (item record) "smoking free" 0
357 Freetext (item record) "smokefree" 3
358 Freetext (item record) "tobacco free" 2
359 Freetext (item record) "cigarette free" 0
361 Freetext (item record) "end smoking" 0
362 Freetext (item record) "ending smoking" 0
363 Freetext (item record) "non smoking" 16
364 351 OR 352 OR 353 OR 354 OR 355 OR 356 OR 357 OR 358 OR 359 OR 361 OR 362 OR 363 78
365 Freetext (item record) smoke 134
366 Freetext (item record) smoking 690
367 Freetext (item record) tobacco 270
368 Freetext (item record) "cigarette*" 226
369 Freetext (item record) "environment*" 378
370 365 OR 366 OR 367 OR 368 OR 369 1148
371 Freetext (item record) "ban*" 102
372 Freetext (item record) "prohibit*" 4
373 Freetext (item record) "hospital" 297
374 Freetext (item record) hospitals 46
375 371 OR 372 OR 373 OR 374 420
376 370 AND 375 81
378 364 AND 375 10
379 346 OR 376 OR 378 126

APPENDIX 3: Inclusion decision questions applied at title and abstract screening stage, with guidance notes (Reviews 6 &7)

Criterion	Guidance notes	Decision
1. YEAR: Was the document published during or after 1990?	Include studies published during or after 1990. Exclude studies before 1990.	If yes, proceed to 2. If no, use EX1 – NOT YEAR
2. LANGUAGE: Was the document published in English?	Include English-language documents. Exclude documents in languages other than English.	If yes, proceed to 3. If no, use EX2 – NOT LANGUAGE
3. RESEARCH: Does the document report on a piece of research?	Include documents that are primary research, in that data have been collected during that study through interaction with or observation of study participants, or secondary research, such as systematic reviews of the literature. Examples of non-research documents include opinion pieces, commentaries, or legislation.	If yes, proceed to 4. If no, use EX3 – NOT RESEARCH
4. SMOKEFREE: Does the title or abstract refer to smokefree strategies or interventions?	Include studies of specific activities or strategies designed to support the implementation of smokefree legislation or policies. If the legislation or policy is not explicitly stated, interventions where the removal of second-hand smoke or environmental tobacco smoke is an explicit aim will be included. Examples of interventions include, but are not restricted to: • restrictions to eliminate smoking on hospital and other secondary care properties and estates, both indoors and outdoors, including signage and enforcement • restrict ions on staff smoking breaks	If yes, proceed to 5. If no, use EX4 – NOT SMOKEFREE

Criterion	Guidance notes	Decision
	• revised job descriptions to include policy enforcement by staff • creation of smokefree 'champions' • campaign and information materials to alert staff and service users of proposed and impending policy changes • interventions that help people temporarily abstain from smoking whilst onsite. Activities/interventions that will not be covered • Programmes or interventions exclusively aimed at preventing the uptake of tobacco use. • Programmes or interventions exclusively aimed at supporting tobacco use cessation.	
5. SECONDARY CARE: Was the study conducted in a secondary care setting or with secondary care staff?	Include studies where the smoking policy is conducted in a mental health, acute or maternity secondary care settings. Also include other settings where secondary care staff undertake their work where second-hand smoke may be present. Secondary care is defined as a service provided by medical specialists who generally do not have first contact with patients—usually referred to by a GP—such as psychiatrist, dermatologist, etc. • Included secondary care settings are the buildings and grounds of hospitals (including accident and emergency departments), psychiatric units, mental health units, secure hospitals, maternity units, outpatient clinics and staff residencies. • The buildings and grounds of prison healthcare units and tertiary care services where secondary healthcare staff are employed, or secondary healthcare is provided, are settings that will be included. • Smokefree legislation in the UK covers enclosed vehicles for paid and voluntary work, thus ambulances and hospital vehicles are also included as settings.	If yes, proceed to 6. If no, use EX5 – NOT SECONDARY CARE

Criterion	Guidance notes	Decision
	Activities/interventions that will not be covered: • Strategies and interventions for ensuring smokefree compliance in primary care settings (e.g., GP surgeries). • Studies looking at policies that apply to public spaces more generally (e.g., national legislation banning smoking in all closed public places) - even if the public spaces might include secondary health care settings.	
6. COMMUNITY SETTINGS BUT NOT SMOKEFREE: Was the study conducted in a secondary care setting (same as Q5), OR in a community or private residence setting AND explicitly refers to smokefree policies and secondary care workers/services?	Exclude community and private residences settings where it is not EXPLICIT from the study paper's title or abstract that they relate to i) smokefree policies/legislation and ii) the secondary care worker/the type of secondary care delivered. Include any other type of secondary care setting, or any community and private residences settings where it is that the study relates to i) smokefree policies/legislation and ii) the secondary care worker/the type of secondary care delivered.	If yes, proceed to 7. If no, use EX6 - COMMUNITY SETTINGS BUT NOT SMOKEFREE
7. RESEARCH DESIGN: Is the study design a comparison (e.g., controlled trials, before-and-after) and/or views or process evaluation (e.g., interviews, surveys)?	The study must be a comparison design or include views/process data on barriers and facilitators. Eligible comparison designs: reviews of reviews, systematic reviews and guidelines (including NICE guidelines), randomised controlled trials, controlled trials, controlled before and after studies, interrupted time series, and uncontrolled before and after studies. Eligible views/process evaluations: This includes trials (controlled and non-controlled), descriptive studies (including questionnaire surveys, and process evaluations), qualitative studies (including, but not restricted to, ethnographies, phenomenologies, and grounded theory studies), discussion	If yes, proceed to 8. If no, use EX7 – NOT RESEARCH DESIGN

Criterion	Guidance notes	Decision
	papers or reports, and 'views studies' (which are written based on a multiple perspective approach with an emphasis on guidance for health professionals). Any studies without these research designs (e.g., single case studies) should be excluded.	
8. EFFECTIVENESS: Does the study evaluate the effectiveness of an intervention?	Include if the study evaluates the effectiveness of an intervention. The study must evaluate the effectiveness of an intervention (or interventions) either through a comparison with a control group or comparison across time, or through reviews of the evidence. Specifically: reviews of reviews, systematic reviews and guidelines (including NICE guidelines), randomised controlled trials, controlled trials, controlled before and after studies, interrupted time series, and uncontrolled before and after studies.	If yes, use IN1 - EFFECTIVENESS. Then proceed to 9. If no, proceed to 9.
9. BARRIERS/FACILITATORS: Does the title or abstract include barriers or facilitators (including knowledge, attitudes and beliefs) of using or implementing smoking cessation interventions/ services?	Include if the title or abstract includes barriers or facilitators (including knowledge, attitudes and beliefs) of using or implementing an intervention. The study must include qualitative and/or quantitative evidence of views and opinions – questionnaire surveys, process evaluations and qualitative studies; both primary studies and systematic reviews.	If yes, use IN2 - BARRIERS/FACILITATORS. End of criteria.
Marker1	Marker for not high income country. Mark any study that was not conducted in a high income country. High income countries are: Andorra, Aruba, Australia, Austria, Bahamas, The, Bahrain, Barbados, Belgium, Bermuda, Brunei Darussalam, Canada, Cayman Islands, Channel Islands, Croatia, Curaçao, Cyprus, Czech Republic,	

Criterion	Guidance notes	Decision
	Denmark, Equatorial Guinea, Estonia, Faeroe Islands, Finland, France, French Polynesia, Germany, Gibraltar, Greece, Greenland, Guam, Hong Kong SAR, China, Hungary, Iceland, Ireland, Isle of Man, Israel, Italy, Japan, Korea, Rep., Kuwait, Liechtenstein, Luxembourg, Macao SAR, China, Malta, Monaco, Netherlands, New Caledonia, New Zealand, Northern Mariana Islands, Norway, Oman, Poland, Portugal, Puerto Rico, Qatar, San Marino, Saudi Arabia, Singapore, Sint Maarten (Dutch part), Slovak Republic, Slovenia, Spain, St. Martin (French part), Sweden, Switzerland, Trinidad and Tobago, Turks and Caicos Islands, United Arab Emirates, United Kingdom, United States, Virgin Islands (U.S.)	

APPENDIX 4: Websites search summary (Reviews 6 &7)

#	Websites searched	Results
1.	Smoke free http://smokefree.nhs.uk	0
2.	NHS Centre for Smoking Cessation and Training http://www.ncsct.co.uk/	0
3.	Action on Smoking and Health (ASH) http://www.ash.org.uk	0
4.	Treat tobacco.net http://www.treatobacco.net/en/index.php	0
5.	Society for Research on Nicotine and Tobacco http://www.srnt.org	0
6.	International Union against Cancer http://www.uicc.org	0
7.	WHO Tobacco Free Initiative (TIF) http://www.who.int/tobacco/en	0
8.	International Tobacco Control Policy Evaluation Project http://www.itcproject.org	0
9.	Tobacco Harm Reduction http://www.tobaccoharmreduction.org/index.htm	0
10.	Current controlled trials www.controlled-trials.com	0
11.	Association for the treatment of tobacco use and dependence (ATTUD) www.attud.org	0
12.	National Institute on drug abuse- the science of drug abuse and addiction http://www.nida.nih.gov/nidahome.html	0
13.	NICE http://www.nice.org.uk/	0
14.	Public health observatories http://www.apho.org.uk/resource/advanced.aspx	0
15.	Scottish Government http://www.scotland.gov.uk/topics/research	0
16.	Welsh Government http://wales.gov.uk/	0
17.	NHS Evidence https://www.evidence.nhs.uk/	1
18.	Joseph Rowntree Foundation http://www.jrf.org.uk/publications	0
19.	UK Centre for Tobacco Control Studies http://www.ukctcs.org/ukctcs/index.aspx	0
20.	World Conference on Tobacco or Health abstracts from 2006, 2009, 2012 conferences	57
21.	Globalink http://www.globalink.org/	0
22.	CDC tobacco control and prevention http://www.cdc.gov/tobacco/	1
23.	Canadian Council for Tobacco Control http://www.cctc.ca/cctc/EN/tcrc/articles/tcarticle.2010-12-24.4349020582	11
24.	Tobacco Information Scotland http://www.tobaccoinscotland.com/page.cfm?pageid=71	0
Total number of records found		**70**

APPENDIX 5: Inclusion decision questions applied at full text screening stage, with guidance notes (Reviews 6 &7)

Notes:

- Shading: reviews 6 & 7; review 6 only; review 7 only
- Each study should have either **one** EX1-EX5 code or **two** review-specific codes

Criterion	Guidance notes	Decision
1. YEAR: Was the document published during or after 1990?	Include studies published during or after 1990. Exclude studies before 1990.	If yes, proceed to 2. If no, use EX1 on FT – NOT YEAR
2. LANGUAGE: Was the document published in English?	Include English-language documents. Exclude documents in languages other than English.	If yes, proceed to 3. If no, use EX2 on FT – NOT LANGUAGE
3. RESEARCH: Does the document report on a piece of primary research?	Include documents that are primary research, in that data have been collected during that study through interaction with or observation of study participants. Exclude reviews but mark systematic reviews to be checked for relevant included studies for Reviews 6 and 7. Examples of non-research documents include opinion pieces, commentaries, or legislation.	If yes, proceed to 4. If no, use EX3 on FT – NOT PRIMARY RESEARCH & mark if a systematic review
Marker 1: Review	*Review excluded but the included studies are to be checked for relevant studies for our reviews.*	
4. SMOKEFREE: Does the document examine smokefree legislation, smokefree policy(ies) or smokefree intervention(s)?	Include studies that examine smokefree legislation or policies or a smokefree intervention(s). If the legislation or policy is not explicitly stated, examination of interventions where the removal of second-hand smoke or environmental tobacco smoke is an explicit aim will be included. Examples of interventions include, but are not restricted to: • restrictions to eliminate smoking on hospital and other secondary care properties and estates, both indoors and outdoors, including signage and enforcement • restrictions on staff smoking breaks • revised job descriptions to include policy enforcement by staff • creation of smokefree 'champions' • campaign and information materials to alert staff and service users of proposed and impending policy changes • interventions that help people temporarily abstain from smoking whilst onsite. Exclude: activities/interventions that will not be covered • Programmes or interventions exclusively aimed at preventing the uptake of tobacco use.	If yes, proceed to 5. If no, use EX4 on FT – NOT EXAMINING SMOKEFREE

Criterion	Guidance notes	Decision
	• Programmes or interventions exclusively aimed at supporting tobacco use cessation. Exclude studies that do not mention smokefree legislation or policies or a smokefree intervention(s). Also exclude studies conducted in smokefree contexts and settings but which do not examine smokefree implementation process and effect.	
5. SECONDARY CARE: Was the study conducted in a secondary care setting or with secondary care staff, users or visitors?	Include studies where the smoking policy is conducted in a mental health, acute or maternity secondary care settings. Also include other settings where secondary care staff undertake their work where second-hand smoke may be present. Secondary care is defined as a service provided by medical specialists who generally do not have first contact with patients—usually referred to by a GP—such as psychiatrist, dermatologist, etc. • Included secondary care settings are the buildings and grounds of hospitals (including accident and emergency departments), psychiatric units, mental health units, secure hospitals, maternity units, outpatient clinics and staff residencies. • The buildings and grounds of prison healthcare units and tertiary care services where secondary healthcare staff are employed, or secondary healthcare is provided, are settings that will be included. • Smokefree legislation in the UK covers enclosed vehicles for paid and voluntary work, thus ambulances and hospital vehicles are also included as settings. Activities/interventions that will not be covered: • Strategies and interventions for ensuring smokefree compliance in primary care settings (e.g., GP surgeries). • Studies looking at policies that apply to public spaces more generally (e.g., national legislation banning smoking in all closed public places) - even if the public spaces might include secondary health care settings.	If yes, proceed to 6. If no, use EX5 on FT – NOT SECONDARY CARE
6. EVALUATION OF EFFECTIVENESS: Does the study evaluate the effectiveness of strategy/ies or intervention/s to support compliance/implementation of smokefree legislation/policies?	Include evaluations of specific activities or strategies designed to support the compliance with or implementation of smokefree legislation or policies. If the legislation or policy is not explicitly stated, interventions where the removal of second-hand smoke or environmental tobacco smoke is an explicit aim will be included. Examples of interventions include, but are not restricted to: • restrictions to eliminate smoking on hospital and other secondary care properties and estates, both indoors and outdoors, including signage and enforcement • restrictions on staff smoking breaks • revised job descriptions to include policy enforcement by staff • creation of smokefree 'champions' • campaign and information materials to alert staff and service users of proposed and impending policy changes • interventions that help people temporarily abstain from smoking whilst onsite. Activities/interventions that will not be covered	If yes proceed to 7 If no, use Rev 6:EX6 on FT – NOT EVALUATION OF EFFECTIVENESS. Then proceed to 8.

Criterion	Guidance notes	Decision
	• Programmes or interventions exclusively aimed at preventing the uptake of tobacco use. • Programmes or interventions exclusively aimed at supporting tobacco use cessation. Exclude studies that do not evaluate a strategy or intervention to support compliance or implementation with smokefree legislation or policy.	
7. RESEARCH DESIGN: Is the study design a comparison (e.g., controlled trials, before-and-after)?	The study must be a comparison design. Eligible comparison designs: guidelines (including NICE guidelines), randomised controlled trials, controlled trials, controlled before and after studies, interrupted time series, and uncontrolled before and after studies. Any studies without these research designs (e.g., single case studies) should be excluded at this stage. However retrospective comparison studies which include self-report behaviour and/or perceptions of compliance post-implementation could provide a valid measure of effectiveness and should be marked so they can be retrieved for Review 6 later if deemed necessary.	If yes, use Rev 6:IN1 on FT – EFFECTIVENESS REVIEW. Then proceed to 8. If no, use Rev 6:EX7 on FT – NOT RESEARCH DESIGN & mark if retrospective comparison study
Marker 2: Retrospective comparison	*Retrospective comparison study which includes self-report behaviour and/or perceptions of compliance post-implementation provide a less robust yet valid measure of effectiveness.* *These studies should be given a marker so they can be retrieved for Review 6 later if deemed necessary*	
8. COUNTRY: Was the study conducted in a high income country(ies)?	Include any study that was conducted in a high income country(ies). High income countries are: Andorra, Aruba, Australia, Austria, Bahamas, The, Bahrain, Barbados, Belgium, Bermuda, Brunei Darussalam, Canada, Cayman Islands, Channel Islands, Croatia, Curaçao, Cyprus, Czech Republic, Denmark, Equatorial Guinea, Estonia, Faeroe Islands, Finland, France, French Polynesia, Germany, Gibraltar, Greece, Greenland, Guam, Hong Kong SAR, China, Hungary, Iceland, Ireland, Isle of Man, Israel, Italy, Japan, Korea, Rep., Kuwait, Liechtenstein, Luxembourg, Macao SAR, China, Malta, Monaco, Netherlands, New Caledonia, New Zealand, Northern Mariana Islands, Norway, Oman, Poland, Portugal, Puerto Rico, Qatar, San Marino, Saudi Arabia, Singapore, Sint Maarten (Dutch part), Slovak Republic, Slovenia, Spain, St. Martin (French part), Sweden, Switzerland, Trinidad and Tobago, Turks and Caicos Islands, United Arab Emirates, United Kingdom, United States, Virgin Islands (U.S.) If a study was conducted in a mixture of high and non-high income countries, include the study. Exclude studies conducted in countries not in this list.	If yes, proceed to 9 If no, use Rev7:EX8 on FT – NOT HI COUNTRY
9. BARRIERS/FACILITATORS: Does the document include barriers or facilitators (including knowledge, attitudes and beliefs) to implementing	Include if the document includes barriers or facilitators (including knowledge, attitudes and beliefs) to implementing or complying with smokefree policies/legislation or smokefree interventions. The study must include qualitative and/or quantitative evidence of views and opinions – questionnaire surveys, process evaluations and qualitative studies. This includes trials (controlled and non-controlled), descriptive studies (including questionnaire surveys, and process evaluations), qualitative studies	If yes, use Rev 7:IN2 on FT – BARRIERS/FACILITATORS REVIEW. If no, use Rev 7:EX9 on FT – NO BARRIERS/FACILITATORS

Criterion	Guidance notes	Decision
or complying with smokefree policies/legislation or smokefree interventions?	(including, but not restricted to, ethnographies, phenomenologies, and grounded theory studies), discussion papers or reports, and 'views studies' (which are written based on a multiple perspective approach with an emphasis on guidance for health professionals) Relevant data may come from papers from process or implementation issues encountered in trials.	End of criteria.
QUERY on FT	Query for team discussion	
Marker 3	*Smoking cessation interventions in acute & maternity care*	
Marker 4	*Smoking cessation interventions in mental health care*	
Marker 5	*Cost-effectiveness*	
Marker 6	*Useful background information*	

APPENDIX 6: Quality Assessment Details for Review 6 Included Studies

Checklist: quantitative correlation studies

1.1 Is the source population or source area well described?
1.2 Is the eligible population or area representative of the source population or area?
1.3 Do the selected participants or areas represent the eligible population or area?
2.1 Selection of exposure (and comparison) group. How was selection bias minimised?
2.2 Was the selection of explanatory variables based on a sound theoretical basis?
2.3 Was the contamination acceptably low?
2.4 How well were likely confounding factors identified and controlled?
2.5 Is the setting applicable to the UK?
3.1 Were the outcome measures and procedures reliable?
3.2 Were all outcome measurements complete?
3.3 Were all the important outcomes assessed?
3.4 Was there a similar follow-up time in exposure and comparison groups?
3.5 Was follow-up time meaningful?
4.1 Was the study sufficiently powered to detect an intervention effect (if one exists)?
4.2 Were multiple explanatory variables considered in the analyses?
4.3 Were the analytical methods appropriate?
4.4 Was the precision of association given or calculable? Is association meaningful?
5.1 Are the study results internally valid (i.e. unbiased)?
5.2 Are the findings generalisable to the source population (i.e. externally valid)?

++ for that aspect, the study has been designed/conducted in such a way as to minimise the risk of bias
+ the answer is not clear from the way the study is reported, or that the study may not have addressed all potential sources of bias for that aspect
– for those aspects of the study design in which significant sources of bias may persist
NR not reported
NA not applicable

Title	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	3.1	3.2	3.3	3.1	3.5	4.1	4.2	4.3	4.4	5.1	5.2
Cormac (2010)	+	++	+	NA	NA	NA	NR	++	+	++	++	NA	++	NR	NA	++	+	+	+
Daughton (1992)	-	++	-	NA	NA	NA	NR	-	-	+	+	NA	+	NR	NA	++	++	- *Demographic data not collected; no control group*	- *Source population not described; potential selection/respondent bias*
Donchin (2004)	++	+	++	NA	NA	NA	NR	+	+	NR	+	NA	+	NR	NA	++	++	+ *No control group for temporal confounders*	+

Erwin (1991)	++	++	+	NA	NA	NA	NR	-	-	NR	+	NA	+	NR	NA	NR	NR	- *Data analysis unreported*	+
Etter (2008)	++	++	+	NA	NA	NA	NR	+	-	+	+	NA	+	-	NA	+	++	+ *Follow-up measures taken 3-5 months post-total ban, subject selection was consistent with no significant diffs btw group demogs*	+ *Small sample size*
Fernández (2008)	+	NA	NA	NA	NR NA	NA	NR	+	++	NA	NR	NA	NA	++	NR	++	+	+	++
Gadomski (2010)	+	++	++	NA	NR NA	NA	NR NA	+	-	++	+	NA	NA	NA	NR	++	+	+ *No baseline group.*	++
Haller (1996)	+	++	++	+	NA	NA	NR	-	+	NR	+	NA	++	NR	NA	++	++	+ *Risk self-selection bias, unvalidated outcome measures, no control group*	+
Hempel (2002)	+	++	++	NA	NR NA	NR	NR	+	++	++	+	NA	+	NA	NR	++	++	+	+
Hudzinski (1990)	+	++	-	NA	NA	NA	-	+	+	NR	+	NA	+	NR	NA	+	-	+ *Same sample but may have become desensitised to questionnaire; no control group*	+
Joseph (1993)	++	++	++	NR	NR	NA	-	+	-	+	+	NA	+	++	+	++	+	+	+ *Did the patients decline admission in the intervention group because of the restrictive smoking policy - the study did not measure this.*
Kvern (2006)	+	NA	NA	NA	NA	NA	NR	+	+	NR	+	NA	++	NR	NA	-	-	- *Limited detail for decision but broad range of mostly cross-sectional measures in source settings.*	+
Martinez (2008)	-	-	-	NA	+	NA	NR	+	-	NR	NA	NA	++	+	NR	+	++	+	+
Matthews (2005)	+	-	-	NA	NA	NA	NR	-	-	NR	+	NA	++	NR	NA	++	++	- *Paper lacks detail on methods/analysis to answer this*	- *Patient source population possibly; no details to assess this for staff source population*
Patten (1995)	+	++	-	NA	NA	NA	NR	+	+	NR	+	NA	++	NR	NA	++	++	+ *Risk self-selection bias, unvalidated outcome measures, no control group*	+ *Patient chart data possibly, not staff and patient survey results*
Quinn (2000)	-	NR	NR	NA	NR	NA	NR	+	-	-	-	NA	+	+	-	-	-	-	+
Rauter (1997)	+	++	NR	NA	+	NA	NA	+	+	++	NA	NA	+	-	-	-	-	+	+ *Only to this specific population*
Rees (2008)	++	NA	NA	NA	NA	NA	+	+	++	NR	++	NA	+	NR	NA	++	+	+ Patients' logs data, no control or random assignment.	++
Ripley-Moffitt (2010)	-	+	+	NA	-	NA	+	+	-	+	+	NA	++	NA	+	NR	-	+	+ *Fairly low response rate plus the fact that*

																			16% of employees were not invited to take part as did not have an email address. No demographics of those who took part at baseline or of the source population.
Shetty (2010)	++	NA	NA	NA	NA	NA	NR	++	+	NR	++	NA	++	NR	NA	++	+	+ *Used objective measures and same sample for follow-ups, no control group. Some checklist items not reported.*	++
Sterling (1994)	-	-	+	NA	-	NA	-	+	+	+	-	NA	+	+	-	-	+	-	+
Stillman (1990)	+	+	+	NA	+	NA	NR	+	+	++	+	NA	++	++	+	++	+	+	+ *69% initial response rate - findings from one hospital.*
Velasco (1996)	+	++	NA	NA	+	NA	-	+	-	NR	NA	NA	++	+	-	+	-	-	-
Vorspan (2009)	+	+	+	NA	NA	NA	+	+	++	++	+	NA	++	NR	NA	++	++	+ *No control group for temporal trends*	+ *Non-smoker day staff only*
Wheeler (2007)	+	++	+	NA	NA	NA	NR	+	+	NR	+	NA	+	NR	NA	++	-	- *Limited reporting as many measures/parts to the study; self-selection bias; no control group*	+

Checklist: quantitative intervention studies

1.1 Is the source population or source area well described?

1.2 Is the eligible population or area representative of the source population or area?

1.3 Do the selected participants or areas represent the eligible population or area?

2.1 Allocation to intervention (or comparison). How was selection bias minimised?

2.2 Were interventions (and comparisons) well described and appropriate?

2.3 Was the allocation concealed?

2.4 Were participants and/or investigators blind to exposure and comparison?

2.5 Was the exposure to the intervention and comparison adequate?

2.6 Was contamination acceptably low?

2.7 Were other interventions similar in both groups?

2.8 Were all participants accounted for at study conclusion?

2.9 Did the setting reflect usual UK practice?

2.10 Did the intervention or control comparison reflect usual UK practice?

3.1 Were outcome measures reliable?

3.2 Were all outcome measurements complete?

3.3 Were all important outcomes assessed?

3.4 Were outcomes relevant?

3.5 Were there similar follow-up times in exposure and comparison groups?

3.6 Was follow-up time meaningful?

4.1 Were exposure and comparison groups similar at baseline? If not, were these adjusted?

4.2 Was Intention To Treat (ITT) analysis conducted?

4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?

4.4 Were the estimates of effect size given or calculable?

4.5 Were the analytical methods appropriate?

4.6 Was the precision of intervention effects given or calculable? Were they meaningful?

5.1 Are the study results internally valid (i.e. unbiased)?

5.2 Are the findings generalisable to the source population (i.e. externally valid)?

++ for that aspect, the study has been designed/conducted in such a way as to minimise the risk of bias

+ the answer is not clear from the way the study is reported, or that the study may not have addressed all potential sources of bias for that aspect

– for those aspects of the study design in which significant sources of bias may persist

NR not reported

NA not applicable

Review 6: Appendices

Title	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	2.10	3.1	3.2	3.3	3.4	3.5	3.6	4.1	4.2	4.3	4.4	4.5	4.6	5.1	5.2
Kempf (1996)	++	++	++	++	++	+	-	+	++	-	++	+	+	++	++	NR	-	++	++	++	NA	-	-	-	+	+	-
Nagle (1996)	++	++	++	-	++	NA	+	++	NR	+	NA	+	+	++	++	NA	++	++	++	+	NA	NR	NR	+	+	+	+

APPENDIX 7: Evidence Tables for Review 6 Included Studies

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Cormac (2010) **Authors** *Cormac et al.* **Year** 2010 **Aim of study** *To evaluate the impact of a total smoking ban in buildings and grounds in a high secure psychiatric hospital.* **Study design** Before-and-after study (with different sample after intervention) *No control group. Pre- and post-ban responses not linked but most sample the same (n=298 patients for study duration)* **Quality score** + **External validity score** +	**Country** England **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health **Source population** Patients **Source population demographics** Smoking status *72.8% patients resident in the hospital for the full evaluation period were smokers before the ban* **Recruitment** Not applicable **Population selection criteria** Inclusion criteria not applicable Exclusion criteria not applicable % participation not reported **Potential sources of bias** *Selection bias possible for the staff/patient survey - most motivated to complete the survey, however the patient incidents, medication and NRT data should be representative* **Setting** *A high secure, long-stay psychiatric hospital for patients with complex mental health disorders who are a grave and immediate danger to the public or themselves (the majority have committed serious offences).*	**Method of allocation** Not applicable Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place **When assessed** Before implementation – multiple time points *Dec 06, Mar 07* After implementation – multiple time points *Apr 07, Jul 07* **Where** Mental Health **Smokefree coverage** Smokefree building(s) Smokefree grounds **Supporting strategies/ interventions** Cessation support Pharmacotherapies/NRT Staff training Other *Information provision (without further detail)* *Surrender of smoking materials (in-patients)* *On the weekend of policy introduction, all wards were fully staffed and additional activities were provided as a distraction.* **Sample size** Not applicable **Baseline comparison** Not applicable **Study sufficiently powered?** Not reported	**Primary outcomes** Other consequence(s) - objective *Untoward incidents: self-harm (threats or actual), verbal abuse (or aggression or threats), physical aggression (attempted or actual), damage to property. Episodes of seclusion due to: threatening behaviour, attacks on staff, attacks on fellow patients. Data from hospital risk department, validation not reported.* *Changes in psychotropic medication: average daily dose of 4 classes of psychotropic medication: regular antipsychotics, regular benzodiazepines, PRN antipsychotics, PRN benzodiazepines.* *Number of patients receiving NRT* **Follow-up periods** Follow-up period(s) *8 months* **Method of analysis** Method(s) of analysis *Untoward incidents: chi-square test comparing Mar 07 and Apr 07, Dec 06 and Jul 07, for both pre-ban smokers and non-smokers. Changes in psychotropic medicine: t-test comparing Mar 07 with Apr 07 and Dec 06 with Jul 07.*	**Primary outcomes** *Untoward incidents: significantly more violent incidents for pre-ban smokers in Jul 07 (198) than in Dec 06 (158) (p=0.01, d.f.=1), other results were not significant for comparisons between pre-ban smokers or non-smokers or all patients for either time period comparison.* *Episodes of seclusion: no significant results for comparisons of numbers of seclusions between pre-ban smokers or non-smokers or all patients for either time period comparison.* *Changes in psychotropic medication: a significant decline in mean dose of regular antipsychotic medication in smokers from Mar 07 (M=64.1, SD 39.4) to Apr 07 (M=61.2, SD 37.4) (t(165)=2.27, p=0.025) (95% CI 0.37-5.42). Other results were not significant for comparisons of mean dose of medication between pre-ban smokers or non-smokers for either time period comparison.* *Number of patients receiving NRT: 149 patients commenced pre-ban (Dec 06-Mar 07), an additional 18 patients commenced post-ban.* **Attrition details** Not applicable	**Limitations identified by author(s)** Identified by author(s) *The opportunistic nature of the evaluation meant there were limits to the data that were available for evaluation. Data were available only for four time periods. The statistically significant result for the comparison of Dec 06 and Jul 07 incidents may be an artefact of a potentially seasonal drop in incidents in the period before Christmas. Cannot say whether any patients were transferred or discharged during the study period for reasons connected with the smoking ban.* **Limitations identified by review team** **Evidence gaps/future research recommendations** Future research recommendations *A long-term evaluation of the health benefits of smoke-free environments to patients in long-stay NHS facilities.* **Source of funding** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Daughton (1992) **Authors** *Daughton et al.* **Year** 1992 **Aim of study** *To examine the early and long-term influence of a total indoor smoking ban on institutional smoking cessation rates, as well as on smoker behaviour and comfort in a hospital setting.* **Study design** Before-and-after study (with same sample after intervention) *Post-sample is a sub-sample of the pre-sample* **Quality score** - **External validity score** -	**Country** USA *Nebraska* **Urban/Rural setting** Not reported **Secondary Care Setting** Not Mental Health (Acute and/or Maternity) **Source population** Staff *Hospital employees* **Source population demographics** None reported **Recruitment** Recruitment method *Survey 1: Hospital departments circulated a 1-page questionnaire generally accompanied by a letter of support from a department representative. Isolated employees who indicated they had not received a department questionnaire were provided with one. Survey 2: the first survey, although anonymous, had space for contact details if willing to be re-contacted.* **Population selection criteria** Inclusion criteria *Survey 1 – all employees (those working in departments and isolated employees); Survey 2 – smokers who participated in Survey 1 who had provided contact details.* Exclusion criteria *Survey 1: Pipe and cigar smokers (n=7), individuals in process of quitting (<5 months abstinence). Survey 2: those no longer employed by hospital (n=11)*	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *No implementation date reported* **When assessed** After implementation – multiple time points *Post-ban Survey 1 (1 year after policy announced, 5 months after implementation); Post-ban Survey 2 (2 years after policy announced, 17 months after implementation)* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) *A "total indoor smoking ban"* **Supporting strategies/ interventions** Implementation committee *32-member Smoke-Free Campus Task Force* Staff letters/payslip notes *Employee bulletins and newsletters* Cessation support *Hospital-promoted cessation programs, and offer to subsidise costs of locally available cessation programs.* Other *In-house media campaign* **Sample size** Total sample *Survey 1: n=1070* *Sample characteristics: n=589 non-smokers, n=284 ex-smokers (self-report abstinent for >5 months prior to ban announcement), n=16 ban-year quitters (self-report abstinent for ≥3 months), n=181 smokers (n=55 light smokers <10 cigs/day, n=110 moderate smokers 10-29 cigs/day, n=22*	**Primary outcomes** Other consequence(s) - subjective *Survey 1: Effect on smoking cessation; Effect on cigarette consumption (unclear if asked to recall pre-ban consumption); Reported decreased work productivity; Changed eating locations to smoke (all self-reported)* *Survey 2: Effect on smoking cessation (self-reported)* **Follow-up periods** Follow-up period(s) *1 year* **Method of analysis** Method(s) of analysis *Fisher's exact test was used to analyse categorical data and Student's t test for continuous data. Comparison values are expressed as means ± standard error of the mean.*	**Primary outcomes** Relevant results - other *Effect on smoking cessation: Five months after implementation of a total indoor ban on smoking, 39% of the surveyed staff smokers (n=79) self-reported trying to quit: 22 enrolled in a stop-smoking program and 57 used a non-program approach. Of those enrolled in a smoking program, 32% (n=7) reported abstinence ≥6 months and of those using a non-program approach, 16% (n=9) reported being smokefree ≥3 months. Comparison with pre-implementation annual quit rates: Of the 284 ex-smokers sampled, 7% (n=20) had stopped smoking during the previous pre-ban year, a percentage only slightly lower than the 8% quit rate (16 of 203) achieved during the ban year (NS, two-tailed Fisher's exact test).* *Seventeen months after implementation of a total indoor ban on smoking at the hospital, and 2 years after the policy was announced, 41% staff smokers (n=36) self-reported trying to quit during the second year of the ban. Two years after the policy was announced, 8% staff smokers (n=7) were reportedly smoke-free for ≥3 months (a similar rate to both pre-ban and ban-year institutional quit rates).* *Effect on mean cigarette consumption: Five months after implementation, a total indoor ban on smoking was*	**Limitations identified by author(s)** Identified by author(s) *Results may have been influenced by limitations of study design (e.g. anonymous initial survey hindered long-term follow-up assessment; incomplete/ unreturned questionnaires may have introduced a selection bias; smoking level subgroups may have been over- or under-represented.* **Limitations identified by review team** *Demographic data not collected; no control group* **Evidence gaps/future research recommendations** None reported **Source of funding** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	% participation agreement *"approximately one-third" Survey 1; 47% Survey 2* **Potential sources of bias** *Self-selection response to survey; low participation ("approx. a third"); follow-up relies on first survey respondents providing contact details (preventing anonymity); no demographics for non-responders* **Setting** *"In a hospital setting"*	*heavy smokers ≥30 cigs/day). Occupations (of those who identified themselves) included: physicians, nurses, cafeteria workers, painters, mail room clerks, laboratory technicians, administrators, secretaries, researchers and environmental service workers.* *Survey 2: n=88* **Baseline comparison** Not applicable **Study sufficiently powered?** Not reported		*associated with a significant decrease in mean cigarette consumption during work hours by staff, from 7.3 cigarettes (SD=0.45) to 4.2 cigarettes (SD=0.26), p<0.0001; during workdays, from 15.6 cigarettes (SD=0.83) to 12.7 cigarettes (SD=0.69), p<0.001; and during non-workdays, from 19.6 cigarettes (SD=0.92) to 18.6 cigarettes (SD= 0.89), p<0.01.* *Sub-group differences: The significant decrease in mean cigarette consumption 5 months after the ban implementation mostly occurred amongst staff self-reported as moderate to heavy smokers (≥10 cigs/day) who reduced from 21.1 (SD=0.93) to 14.7 (SD=0.80) cigarettes, p<0.001. Light smokers (<10 cigs/day) day) showed only a slight decrease in mean daily cigarette consumption from 4.8 (SD=0.39) to 4.4 (SD=0.44) cigarettes, p<0.05.* *Reported decreased productivity: Sub group differences: Five months after implementation of a total indoor ban on smoking, more staff heavy smokers (≥30 cigs/day) (46%) than moderate (10-29 cigs/day) (30%) or light smokers (<10 cigs/day) (4%) reported that the smoking ban had a negative effect on their work productivity (p<0.001). The authors note this was "apparently because of their need to leave the work area in order to smoke" [p.674].* *Changed eating locations to smoke:*	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
				Five months after implementation of a total indoor ban on smoking, 42% smoker staff respondents reported that the smoke-free policy affected where they ate their workday meals (n=75), eating at least one meal a week away from the hospital in order to smoke. Sub-group differences: Staff who self-reported as heavy smokers (≥30 cigs/day) were more likely to report that the smoke-free policy affected where they ate their workday meals: 73% heavy smokers compared with 44% moderate smokers (10-29 cigs/day) and 26% light smokers (<10 cigs/day)(p=0.0008). **Attrition details** Not applicable	
Donchin (2004) **Authors** *Donchin & Baras* **Year** 2004 **Aim of study** *A process and outcome evaluation of policy implementation using two successive random-sample surveys among hospital employees (before the introduction and 6 months after) assessing attitudes toward the policy, short-term impact on smoking in unauthorized areas in the hospital, and changes in employee smoking behaviour.*	**Country** Israel **Urban/Rural setting** Urban *City* **Secondary Care Setting** Not Mental Health (Acute and/or Maternity) **Source population** Staff *Hospital's general employee population on payroll July 2000 (n=3670)* **Source population demographics** Occupation *Doctors and dentists 18.0%, nurses 30.3%, administrators and clerks 16.9%, technicians 22.8%, unskilled workers 12.0%* Age *<35 years 24.5%, 35– 44 years*	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented 1 Nov '00* **When assessed** Before implementation – single time point *3 months pre-policy* After implementation – single time point *6-9 months post-policy* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/ interventions** Implementation committee Cessation support *Employees* Other *Smoking shelters ("booths") erected outside*	**Primary outcomes** Compliance - subjective *Observed smoking in unauthorized areas (''How often do you see people [employees, patients or visitors] smoking at work in places where smoking is banned?''); Locations of observed unauthorized smoking (post-policy only); Smoking habits at work (staff smokers)* Other consequence(s) - subjective *Mean cigarettes smoked (staff smokers, self-reported) in total and during work hours only)* Other consequence(s) - objective *Readiness to quit (staff smokers, based on Prochaska's stages of change model)* **Follow-up periods** Follow-up period(s) *9-12 months*	**Primary outcomes** Relevant results - compliance *Observed smoking in unauthorized areas: A significant reduction in observed smoking (by employees, patients, or visitors) in unauthorized areas was reported by staff in the hospital building after policy implementation: frequently observe smoking in unauthorized places (63.2% pre- vs. 41.4% post-, p value not given), occasionally observe smoking in unauthorized places (22.6% pre- vs. 16.3% post-, p value not given), never observe smoking in unauthorized places (14.2% pre- vs. 42.3% post-, p<0.001).* *Observed smoking in unauthorized areas, sub-group differences: smokers and non-smokers responded similarly*	**Limitations identified by author(s)** None identified by author(s) **Limitations identified by review team** *no control group for temporal confounders* **Evidence gaps/future research recommendations** Evidence gaps *Collecting specific data as to whom the covert smokers might be (hospital staff, or patients and visitors to the hospital) and how common the practice really is would be helpful to tailor-make further interventions aimed at eliminating smoking in the hospital.* **Source of funding**

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Study design Before-and-after study (with different sample after intervention) **Quality score** + **External validity score** +	*27.8%, 45– 54 years 29.4%, 55+ years 18.3%* Sex *Males 36.5%* Education *No data available* **Recruitment** Recruitment method *Simple random sampling method was used: pre-policy survey based on a sample of 11% of 3,670 hospital workers; the post-policy survey drew a 12% sample of 3,705 workers employed at that time to allow for the exclusion of workers who already participated in the first survey. Surveys conducted by hospital's occupational health unit and school of public health. Interviewers sought out every worker entering each sample survey, presenting them with the questionnaire that was completed immediately and returned directly to interviewers. Confidentiality was promised though the questionnaires were not anonymous.* **Population selection criteria** Inclusion criteria *All salaried employees on the payroll in July 2000 (pre-policy sample) and April 2001 (post-policy sample) were eligible* Exclusion criteria not reported % participation agreement *90.4% (pre-policy), 92.8% (post-policy)* **Potential sources of bias** *Authors state pre- and post-*	*the hospital building; sale of tobacco products banned on site; Information campaign (2 months pre-policy) and press conference launch; Fines for violations authorised* **Sample size** Total sample *n=368 staff (pre-policy), n=364 (post-policy)* *Sample characteristics (pre- and post-policy):* *Doctors and dentists 17.1% (pre-) 13.5% (post-), nurses 27.4% 31.9%, administrators and clerks 14.9% 17.0%,technicians 28.0% 26.6%, unskilled workers 12.5% 11.0%; <35 years 23.1% (pre-) 22.5% (post-), 35– 44 years 26.9% 28.3%, 45– 54 years 29.3% 27.7%, 55+ years 20.7% 21.4%; Males 36.1% (pre-) 30.2% (post-); 0-12 years of education 23.2% (pre-) 25.4% (post-), 13-15 years of education 23.5% 18.5%, 16+ years of education 53.3% 56.1%. Smoking status: current smokers 19% (pre-) 19.5% (post-), past smokers 12.5% 19.5%.* **Baseline comparison** Not applicable **Study sufficiently powered?** Not reported	**Method of analysis** Method(s) of analysis *36 employees participated in both surveys. Their data were included in the pre-policy survey findings only. Univariate comparisons between pre- and post-policy responses between the two surveys or between 'smoker' and 'non-smoker' responses within each survey were made using Fisher's Exact test for dichotomies and chi-square tests for categorical variables with more than two categories. Wherever a table contained a cell with an expected frequency <5, the P value reported is exact and not asymptotic. Logistic regression was the main tool used for multivariate analysis.*	*in the pre-policy survey. However, smokers were less likely to report observation of smoking in unauthorized places than non-smokers post-policy (p=0.03). Both smoker and non-smoker reporting in the post-policy survey was associated with education (p=0.03 and p=0.0001, respectively), the reporting of frequently observed smoking in unauthorized areas increased with the number of years of education. No significant association was found for gender, age or occupation.* *Locations of observed unauthorized smoking (post-policy only): 31% in public domain areas (corridors, balconies, staircases), 10.5% in several sites, 7.7% in the workstation, and 4.6% in covert areas (closed rooms, toilets).* *Smoking habits at work (staff smokers): A significant increase in staff smokers reporting they always usually leave their workstation to smoke post-policy (62.1%) compared with pre-policy (16.9%) (p<0.0001).* *Smoking habits at work (staff smokers), sub-group differences: post-policy self-reported compliance (leaving workstation to smoke) of smokers with the new regulations was associated with occupation: clerical staff (85.7%), nurses (76.5%) and doctors (66.7%) were most likely to comply while technicians (40.0%) and*	Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	samples are representative of eligible population; comparable demogs in Table 1 (no stats analysis) **Setting** *A 959-bed university hospital in Jerusalem, employing over 3,700 salaried workers and accommodating 42,580 inpatients and 201,185 outpatient visits (2001).*			*unskilled workers (e.g. cleaners, 47.1%)) were least likely to do so (p=0.04). No significant association was found for gender or years of education.* Relevant results - other *Mean cigarettes smoked (staff smokers): No appreciable change in the number of cigarettes smoked (in total or during work hours only) pre- and post-policy implementation. (Mean total cigarettes per day 13.6 (SD=10.4) (pre-), 12.9 (SD=10.4) (post-); mean cigarettes smoked during work hours 5.38 (SD=4.7) (pre-) 4.9 (SD=4.7) (post-).)* *Readiness to quit (based on Prochaska's stages of change model) (staff smokers): The majority of staff smokers, in both surveys, were classified in the pre-contemplation stage (49.2% pre- and 57.4% post-policy); few were classified in the preparatory stage (12.7% pre- and 8.2% post-policy). The distribution by stages of change was not associated with age, gender, education or occupation, or with degree of compliance to the new policy.* **Attrition details** Not applicable	
Erwin (1991) **Authors** *Erwin & Biordi* **Year** 1991 **Aim of study**	**Country** USA *Illinois* **Urban/Rural setting** Urban **Secondary Care Setting** Mental Health	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented 1 Mar '90 (announced 2 months earlier)*	**Primary outcomes** Compliance - subjective *Psychiatric patients' compliance (rate of requests to patients to terminate smoking a lit cigarette, rate of requests to family to desist 'smuggling' cigarettes to patients);*	**Primary outcomes** Relevant results - compliance *Psychiatric patients' compliance: Patient compliance with the smokefree policy, as reported by nursing staff, was higher 1 week after implementation than it was 3 weeks*	**Limitations identified by author(s)** None identified by author(s) Identified by review team *No description of analysis or significance values* **Limitations identified by**

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
This study presents the reactions of nursing staff members on two VA inpatient psychiatric wards who experienced the transition to smoke-free status. **Study design** Before-and-after study (with same sample after intervention) **Quality score** - **External validity score** +	**Source population** Staff *Nursing staff* **Source population demographics** Occupation *Ward A: 12 registered nurses, 2 licensed practical nurses, 2 nurses aides* *Ward B: 7 registered nurses, 3 licensed practical nurses, 3 nurses aides* **Recruitment** Recruitment method *Memos and reminders sent by head nurses to nursing staff to collect questionnaire from a confidential site.* **Population selection criteria** Inclusion criteria *All nursing staff members on the two acute psychiatric wards* Exclusion criteria not reported % participation agreement *100% (Pre-ban ward A), 100% (Pre-ban ward B), 63% (1 week post-ban ward A), 50% (1 week post-ban ward B), 100% (4 weeks post-ban ward A), 77% (4 weeks post-ban ward B)* **Potential sources of bias** *100% before; 50-63% 1wk after; 77-100% 4wk after; self-selection, small convenience sample* **Setting** *A VA (US Dept. of Veterans Affairs) hospital in an urban centre in Illinois. Two 21-bed acute care psychiatric wards for veterans with diagnose including schizophrenia,*	**When assessed** Before implementation – single time point *No date* After implementation – multiple time points *1 week following implementation and 4 weeks following implementation* **Where** Mental Health **Smokefree coverage** Other *Smokefree acute psychiatric wards (presume from the paper's introduction, the rest of hospital is smokefree)* **Supporting strategies/ interventions** Cessation support *Nursing interventions included "Encouraged patients to participate in smoking cessation groups"* Other *Interventions by nursing staff that address patients with the urge to smoke on the psychiatric ward (e.g. encouraging activities that foster energy replenishment/use; promoting physical benefits of not smoking and preventing harm; individualising care (p.r.n. medications, time outs); involving significant others in care).* **Sample size** Total sample *n=29* *Sample characteristics: 66% (n=19) registered nurses, 17% (n=5) licensed practical nurses, 17% (n=5) nurses aides* **Baseline comparison** Not applicable **Study sufficiently powered?** Not reported	*Staff's rating of their own overall individual effectiveness (use of strategies) to help patients comply with smokefree (all self-report measures)* Other consequence(s) - subjective *Nursing staff's involvement in nursing interventions post-implementation that addressed patient's urge to smoke (all self-report measures): offered medications as needed (p.r.n. medications), encouraged room "time outs" to decrease stimulation, intervened verbally or physically to prevent a patient who demanded to smoke from harming self or others, encouraged patients to participate in smoking cessation groups.* **Follow-up periods** Follow-up period(s) *<3 months (date of baseline survey not stated)* **Method of analysis** Not reported	*later: 30% nursing staff on Ward A and 20% on Ward B requested patients to terminate smoking a lit cigarette 1 week post-implementation; these rates rose to 63% and 40% respectively 4 weeks post-implementation. (No p values calculated) After smokefree implementation, there was a decline in nursing staff reporting that they had discouraged family or significant others from "smuggling" cigarettes to patients, from 40% and 75% (Wards A and B) 1 week post-implementation to 20% and 60% 4 weeks post-implementation. (No p values calculated)* *Staff's rating of their own overall individual effectiveness (use of strategies) to help patients comply with smokefree: One week post-implementation, nursing staff ratings of their own overall individual effectiveness (use of strategies, regardless of the number and type) to help patients comply with smokefree on the wards by addressing their urge to smoke were 80% and 70% (Wards A and B) 'mildly' or 'moderately effective'; and 75% and 90% 'mildly' or 'moderately effective' 4 weeks post-implementation. (Data for 'not effective' or 'very effective' not reported). (No p values calculated)* Relevant results - other *After smokefree implementation, there was a decline in nursing staff reporting that they had offered*	**review team** *Data analysis unreported* **Evidence gaps/future research recommendations** Evidence gaps *Few articles document the effects of establishing smokefree psychiatric units (1991)* **Source of funding** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	depression and post-traumatic stress disorder			*medications as needed (p.r.n. medications), from 60% and 75% (Wards A and B) 1 week post-implementation to 40% and 40% 4 weeks post-implementation. (No p values calculated)* *After smokefree implementation, there was little change in nursing staff reporting that they had encouraged room "time outs" to decrease stimulation, from 40% and 88% (Wards A and B) 1 week post-implementation to 60% and 70% 4 weeks post-implementation. (No p values calculated)* *After smokefree implementation, there was a decline in nursing staff reporting that they intervened verbally or physically to prevent a patient who demanded to smoke from harming self or others, from 20% and 37% (Wards A and B) 1 week post-implementation to 20% and 10% 4 weeks post-implementation. (No p values calculated)* *After smokefree implementation, there was a decline in nursing staff reporting that they had encouraged patients to participate in smoking cessation groups from 80% and 100% (Wards A and B) 1 week post-implementation to 60% and 50% 4 weeks post-implementation. (No p values calculated)* **Attrition details** Not applicable	

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Etter (2008) **Authors** *Etter, Khan & Etter* **Year** 2008 **Aim of study** *To compare the acceptability and efficacy of a partial smoking ban and total ban in an in-patient psychiatric hospital* **Study design** Before-and-after study (with different sample after intervention) *(The staff sample consisted of largely the same people who answered successive surveys, although results not linked)* **Quality score** + **External validity score** +	**Country** Switzerland **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health **Source population** Patients Staff Specific Ward(s)/Department(s) **Source population demographics** Health status *Patients: had mainly psychotic disorders, depression and personality disorders.* Age *Adults* **Recruitment** Recruitment method *A physician, nurse or psychologist distributed self-report questionnaires to patients and staff after explaining the study and obtaining written informed consent. Patients answered the survey as soon as their condition allowed (about 1 week after admission for most). The distributing staff completed the questionnaires with patients who were unable to answer by themselves.* **Population selection criteria** Inclusion criteria *All patients and staff present at the time of data collection* Exclusion criteria not reported % participation agreement *Patients: 86.0% (2003 no ban), 67.5% (2006 total ban); Staff: 100%*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *Implemented in Jan 06* **When assessed** Before implementation – multiple time points *Oct 03 (pre ban), Apr 04 (2 months post-partial ban), Dec 05 (20 months post-partial ban/pre-total ban)* After implementation – single time point *Mar-May 06 (3-5 months post-total ban)* **Where** Mental Health **Smokefree coverage** Smokefree building(s) *Patients (except those in locked rooms) and staff were allowed to leave the unit to smoke outside* **Supporting strategies/ interventions** Posters/signage Cessation support Pharmacotherapies/NRT *NRT free for patients, not for staff.* Closure of smoking rooms Staff training **Sample size** Total sample *2003 (no ban) n=106 (n=49 patients, n=57 staff), 2006 (total ban) n=134 (n=77 patients, n=57 staff)* *Sample characteristics: Patients 2003 (no ban) 91.8% Ever smoked 100+ cigarettes, Daily smokers 73.5%, Occasional (non-daily) smokers 6.1%, Former smokers 12.2%, Never smokers 8.2%; mean age 39.9 years; 59.2% men. Patients 2006 (total ban) 81.6% Ever smoked 100+ cigarettes, Daily smokers*	**Primary outcomes** Compliance - subjective *Perceived exposure to ETS among non-smokers (patients and staff) in unit (bedrooms, dining rooms, corridors); Annoyance from ETS among non-smokers (patients and staff) in unit (bedrooms, dining rooms, corridors)* Other consequence(s) - subjective *Smoking behaviour of patients who smoke (Mean cigarettes per day, now; Mean cigarettes per day, before admission; Smoke more/less/same since admission); Smoking cessation of patients who smoke; Provision of smoking cessation interventions (by staff) (measured in 2005 and 2006 only)* **Follow-up periods** Follow-up period(s) *29-31 months* **Method of analysis** Method(s) of analysis *Chi-square tests and odds ratios to compare proportions, and independent-sample t tests to compare means.*	**Primary outcomes** Relevant results - compliance *Perceived exposure to ETS among non-smokers (patients and staff) in unit (bedrooms, dining rooms, corridors): Between 2003 (no ban) and 2006 (total ban), there was a non-significant increase in the percentage of non-smokers patients reporting that they were 'never' exposed to ETS in their unit in bedrooms (69.2% to 88.5%, p=0.058), in dining rooms (30.8% to 73.1%, p=0.09) and in corridors (23.1% to 65.4%, p=0.029). Between 2003 (no ban) and 2006 (total ban), there was a non-significant increase in the percentage of non-smokers staff reporting that they were 'never' exposed to ETS in their unit in bedrooms (16.7% to 31.0%, p=0.041), in dining rooms (26.2% to 71.4%, p=0.004) and in corridors (9.5% to 38.1%, p=0.006). After the 2006 total ban, 31% of non-smokers (staff and patients) reported that they were 'often' or 'sometimes' exposed to ETS in their unit in bedrooms, 12.0% were 'often' exposed to ETS in corridors (no p values given) and none reported that they were 'often' exposed to ETS in dining rooms and offices. Non-smoker staff reported more exposure to ETS than patients across all surveys.* *Annoyance from ETS among non-smokers (patients and staff) in unit (bedrooms, dining rooms, corridors): Between 2003 (no ban) and 2006*	**Limitations identified by author(s)** Identified by author(s) *Self-reports are subject to social desirability bias. Independent sample t-tests are too conservative and may underestimate the statistical significance (as many of the same staff took part in several surveys). The 2006 survey was conducted 3 months after implementation and may not reflect long-term acceptability and impact. The sample size was relatively small, which increases the risk of type II error. Without a control group, naturally occurring time trends could not be distinguished.* **Limitations identified by review team** *Follow-up measures taken 3-5 months post-total ban, subject selection was consistent with no significant diffs btw group demographics* **Evidence gaps/future research recommendations** Evidence gaps *"The acceptability and impact of total smoking bans in psychiatry hospitals is incompletely documented, in particular in Europe."* **Source of funding** Other

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	(2003 no ban), 91.9% (2006 total ban) **Potential sources of bias** *staff 92-100% participation ('03, '06), patients 86-68%. No data on non-responders. Small sample size.* **Setting** *Two in-patient, adult units of the Psychiatry Department of the Geneva University Hospitals: an admission and short-stay unit (16 beds, mean duration of stays=17 days, median=7 days) and a medium-stay unit (16 beds, mean duration of stays=37 days, median=15 days). Patients had mainly psychotic disorders, depression and personality disorders.*	*65.8%, Occasional (non-daily) smokers 2.6%, Former smokers 15.8%, Never smokers 15.8%; mean age 41.0 years; 60.0% men.* *Staff 2003 (no ban) 64.9% Ever smoked 100+ cigarettes, Daily smokers 26.3%, Occasional (non-daily) smokers 7.0%, Former smokers 22.8%, Never smokers 43.9%; mean age 38.8 years; 35.1% men. Staff 2006 (total ban) 57.9% Ever smoked 100+ cigarettes, Daily smokers 26.3%, Occasional (non-daily) smokers 7.0%, Former smokers 22.8%, Never smokers 43.9%; mean age 40.7 years; 37.5% men.* **Baseline comparison** Not applicable **Study sufficiently powered?** - *Authors note that the sample size was relatively small, which increases the risk of type II error.*		*(total ban), there was a non-significant increase in the percentage of non-smokers patients reporting that they were 'absolutely not' annoyed by ETS in their unit in bedrooms (61.5% to 76.9%, p=0.108), in dining rooms (38.5% to 80.8%, p=0.007) and in corridors (38.5% to 69.2%, p=0.162). Between 2003 (no ban) and 2006 (total ban), there was a significant increase in the percentage of non-smokers staff reporting that they were 'absolutely not' annoyed by ETS in their unit in dining rooms (31.0% to 81.00%, p<0.001) and a non-significant increase in bedrooms (23.8% to 45.2%, p=0.095), and in corridors (23.8% to 52.4%, p=0.023). After the 2006 total ban, 15.8% of non-smokers (staff and patients) reported that they were 'a lot' or 'somewhat' annoyed by ETS in their unit in bedrooms, 13.6% in corridors and 1.8% in dining rooms (no p values given). Non-smoker staff reported more annoyance from ETS than patients across all surveys.* Relevant results - other *Smoking behaviour of patients who smoke: There was no significant change in the cigarette consumption in the clinic of patients who smoked between 2003 (pre-ban) and 2006 (total ban) (24.1 to 23.7 mean cigarettes per day now (p=0.81) and 24.3 to 29.4 mean cigarettes per day before admission (p=0.17)). There was no significant change in smoking prevalence since admission in the clinic*	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
				of patients who smoked between 2003 (pre-ban) and 2006 (total ban). In 2003, 42.2% patients who smoked reported smoking more in the clinic than before admission and in 2006 39.6% reported smoking more in the clinic than before admission (no p values given). *Smoking cessation of patients who smoke: Between 2003 (no ban) and 2006 (total ban) there was a significant increase in the patients who smoked reporting that during their current stay a physician or nurse provided medication (like a patch, gum or Zyban) to quit smoking (5.1% to 52.2%, p<0.001) and non-significant increase in those reporting staff advised them to quit smoking (15.4% to 42.6%, p=0.006) and staff helped them to quit smoking (2.6% to 19.6%, p=0.015).* *Provision of smoking cessation interventions (by staff): Staff reported that the proportion of patients to whom help was provided to quit smoking increased from 26.9% in 2005 (post-partial ban) to 58.2% in 2006 (full ban) (p=0.007, OR 3.8, 95% CI (1.6-9.3)). Staff reported that the proportion of patients to whom NRT was provided significantly increased from 42.3% in 2005 (post-partial ban) to 74.5% in 2006 (full ban) (p<0.001, OR 4.0, 95% CI (1.6-9.9)).* **Attrition details** Not applicable	

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Fernández (2008) **Authors** *Fernández et al.* **Year** 2008 **Aim of study** *To assess changes in second-hand smoke exposure by means of airborne nicotine concentrations in public hospitals of Catalonia (Spain) before and after a comprehensive national smoking ban.* **Study design** Other *Before and after measurement of air vapour-phase nicotine* **Quality score** + **External validity score** ++	**Country** Spain **Urban/Rural setting** Not reported **Secondary Care Setting** Not reported **Source population** Everyone on the premises **Source population demographics** None reported **Recruitment** Recruitment method *All hospitals who had actively implemented the smoke-free policy were included* Not applicable **Population selection criteria** Inclusion criteria not applicable Exclusion criteria not applicable % participation not reported **Potential sources of bias** Not applicable **Setting** *44 of 61 public hospitals (directly managed by or serving the national health service), all who have joined the Catalan Network for Smoke-Free hospitals and implemented the Smokefree Hospital Project.*	**Method of allocation** Not applicable Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *January 1st 2006* **When assessed** Before implementation – single time point *September-December 2005* After implementation – single time point *September-December 2006* **Where** Not reported **Smokefree coverage** Smokefree building(s) **Supporting strategies/ interventions** Cessation support *to professionals, patients and visitors* Staff training *tobacco control training* Other *Guaranteeing common follow up and evaluation* **Sample size** Total sample *44 public hospitals* *Sample characteristics: 22 county hospitals of basic health care level, 10 reference hospitals and 12 university hospitals. Median number of beds=250, with 18 hospitals >300 beds. Median number of employees=612, with one third hospitals >800 workers.* **Baseline comparison** Not applicable **Study sufficiently powered?** ++	**Primary outcomes** Compliance - objective *Overall change in median airborne nicotine concentrations across the hospitals before and after smokefree implementation; Change in median airborne nicotine concentrations by location across the hospitals before and after smokefree implementation. Airborne nicotine concentration levels sampled using a plastic cassette (with a windscreen on one side) containing a 37mm diameter filter treated with sodium bisulphate. 7 devices in hospitals with ≥300 beds, 5 devices in hospitals with 100-300 beds and 3 devices in hospitals <100 beds. Devices installed by trained researcher in 7 public and staff locations: cafeterias, surgical area staff dressing rooms, general surgery unit corridors, general medicine hospitalization unit corridors, top floor fire escapes, emergency department waiting rooms, and main entrance halls. Devices installed (free-hanging, away from regular smoking areas, corners, shelves and curtains) for 7 days in the same locations during September–December in 2005 and 2006.* **Secondary outcomes** Not reported **Follow-up periods** Follow-up period(s) *12 months* **Method of analysis** Method(s) of analysis *Medians and interquartile ranges (IQR) to describe the data.*	**Primary outcomes** Relevant results - compliance *Overall change in median airborne nicotine concentrations across the 44 sampled hospitals before and after the implementation of smokefree legislation:* *198 standard locations across 44 hospitals were sampled for vapour-phase nicotine (a proxy measure for ETS) before and after the implementation of smokefree legislation (in Sep-Dec '05 and in Sep-Dec '06 respectively). Airborne nicotine was detected in 96.5% of the locations in 2005 (191/198) and decreased to 66.2% of the locations in 2006 (131/198 sample). The overall median nicotine concentration level significantly declined by 56.5%, from 0.23 mcg/m3 (IQR, 0.13–0.63) in 2005 (pre-implementation) to 0.10 mcg/m3 (IQR, 0.02–0.19) in 2006 (post-implementation) (p<0.01). There were no sub-group differences in median nicotine concentrations before and after smokefree implementation by the type of hospital (county, reference or university) or the size of hospital (number of beds and number of employees).* *Change in median airborne nicotine concentrations by location across the 44 sampled hospitals before and after the implementation of smokefree legislation:* *Median nicotine concentration levels (a proxy measure for ETS levels)*	**Limitations identified by author(s)** Identified by author(s) *Airborne nicotine measured in the 44 hospitals voluntarily affiliated to the Catalan Network of Smoke-free Hospitals, which are thought to perform better in tobacco control than those hospitals (n=17) still not affiliated. The previous Catalan legislation banned smoking in hospitals, although smoking rooms and cafeterias for smokers or with smoking areas were allowed. Before the new law, most of the hospitals not included in this study had smoking rooms, and some of them had developed initiatives for tobacco control on their own.* *A number of lost devices occurred in places where high nicotine concentrations were found, such as fire escapes, cafeterias or emergency department waiting rooms. Although these selective losses could reduce the overall nicotine concentrations, the analyses by location show a consistent pattern of decrease* **Limitations identified by review team** **Evidence gaps/future research recommendations**

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
			Paired differences compared using Wilcoxon signed rank test for bivariate analyses	*declined significantly in all 7 locations measured across the 44 hospitals between 2005 (before smokefree implementation) and 2006 (after smokefree implementation). Before smokefree implementation, median nicotine concentrations were highest in cafeterias (0.62 mcg/m3, IQR 0.23–3.43), followed by top-floor fire escapes (0.31 mcg/m3, IQR 0.14–0.87) dropping by 83.9% (to 0.10 mcg/m3, IQR 0.02–0.18) and by 51.6% (to 0.15 mcg/m3, IQR, 0.02–0.22), respectively (p<0.01). Before smokefree implementation, median nicotine concentrations were lowest in staff dressing rooms (in the surgical area) (0.18 mcg/m3, IQR 0.18–1.17) dropping by 83.3% (to 0.03 mcg/m3, IQR 0.02–0.22, p<0.05). The greatest declines in median nicotine concentration levels after smokefree implementation occurred in general surgery hospitalization unit corridors, dropping by 97.8% (from 0.23 mcg/m3, IQR 0.09–0.42) to concentrations under the limit of quantification (0.01 mcg/m3, IQR 0.01–0.14, p<0.01); and in general medicine hospitalization unit corridors, dropping by 97.2% (from 0.18 mcg/m3, IQR 0.10–0.33) to concentrations also under the limit of quantification (0.01 mcg/m3, IQR 0.01–0.10, p<0.01). Following the implementation of smokefree, airborne nicotine concentrations declined to a lesser extent in the emergency department waiting*	None reported **Source of funding** Government

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				rooms, by 30.4% (from 0.23 mcg/m3 (IQR 0.15–0.52) to 0.16 mcg/m3 (IQR 0.7–0.24), p<0.01), and at the main hall entrance, by 31.6% (from 0.19 mcg/m3 (IQR 0.13–0.63) to 0.13 mcg/m3 (IQR 0.06–0.22), p<0.01). *Sub-group differences: For the 33 hospitals where airborne nicotine concentrations levels were measured in the cafeterias, before the smokefree legislation was implemented, smoking was still totally permitted in the cafeteria in 3 hospitals, partially permitted in the cafeteria in 6 hospitals and already totally prohibited in the cafeteria in 24 hospitals. The median nicotine concentrations were highest in cafeterias where smoking was partially permitted (3.67 mcg/m3 (IQR, 3.04–6.25)) and totally permitted before the ban (3.61 mcg/m3 (IQR, 0.82–11.48)) dropping by 93.2% (to 0.25 mcg/m3 (IQR, 0.03–0.42), p<0.01) and by 97.0% (to 0.11 mcg/m3 (IQR, 0.05–0.19), p=0.109) after the ban, respectively. The median nicotine concentration level was already low in hospital cafeterias where smoking was already prohibited in 2005 (0.48 mcg/m3 (IQR 0.18–0.68)) and declined by 81.3% after implementation (to 0.09 mcg/m3 (IQR, 0.02–0.17), p<0.01).* **Attrition details** Not applicable	
Gadomski (2010)	**Country** USA	**Method of allocation** Not applicable	**Primary outcomes** Other consequence(s) - objective	**Primary outcomes** Relevant results - other	**Limitations identified by author(s)**

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors *Gadomski et al.* **Year** 2010 **Aim of study** *To addresses the following questions: Does the institution of hospital smoking bans reduce the percentage of inpatients who smoke or increase the percentage who sign out against medical advice? What are the extended effects (beyond 1 year after implementation) of medical campus smoking bans on employee smoking rates?* **Study design** Before-and-after study (with different sample after intervention) *Patients* Before-and-after study (with same sample after intervention) *Staff* **Quality score** + **External validity score** ++	**Urban/Rural setting** Not reported **Secondary Care Setting** Not Mental Health (Acute and/or Maternity) **Source population** Patients Staff **Source population demographics** None reported **Recruitment** Recruitment method *All patients admitted to hospital in study period* **Population selection criteria** Inclusion criteria *Patients: all admitted to hospital* *Staff: those reporting in both 2005 and 2007 with anniversary dates between March and June AND/OR all those employees who reported pre ban smoking status* % participation not reported **Potential sources of bias** *All participants during time frame.* **Setting** *A 180-bed, acute care inpatient teaching facility in a small town in upstate New York*	Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *1st July 2006* **When assessed** Before implementation – single time point *Staff: March-June 05* Before implementation – multiple time points *Patients: each month January 05-June 06* After implementation – single time point *Staff: March-June 06* After implementation – multiple time points *Patients: July 06-Spetember 08* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) Smokefree doorways/entrances Smokefree grounds *Although doesn't say how comprehensive grounds ban is* **Supporting strategies/ interventions** Cessation support Pharmacotherapies/NRT Other *Campus map detailing new smoke free borders.* *Staff, community and patient education* **Sample size** Total sample *Average of n=959 patients per month pre-ban, n=988 per month post-ban.* *Cohort of n=489 staff reporting in both 05 and 07. n=624 staff with anniversary date Mar-Jun 05; n=661 staff with anniversary date Mar-Jun 06; n=1112 staff with anniversary date Mar-Jun 07 (07 sample includes new hires and management staff).*	*Inpatient volume* *Percentage of patients who smoke* *Patients signing out against medical advice* *NRT prescriptions* *Staff smoking rates* **Follow-up periods** Follow-up period(s) *1 year: March-June pre and post ban* **Method of analysis** Method(s) of analysis *Inpatient Electronic Medical Record was used to monitor inpatient smoking prevalence.* *Nursing records of patients signing out against medical advice* *Computerised inpatient doctors orders to pharmacy for NRT* *No data given on analysis methods for the above.* *Smoking prevalence amongst cohort of staff (n=489) pre and post ban in paired replicates compared using McNemar test.* *Smoking prevalence amongst all employees in database compared using a t test.*	*18 months pre-ban, average or 959 patients admitted/month; 23 months post-ban, average of 988 patients admitted/month* *Monthly average of patients who smoke approximately 21.6% following ban, little variation pre ban to post ban* *% patients signing out AMA with reason of having to smoke 13.8% 6 months pre ban, 13.6% post ban, 0% in 2007* *Smoking amongst all patients signing out AMA 48.3% 6 months pre ban, 59% 6 months post ban, 50.8% 2007* *NRT prescriptions increased from 832 2 years prior to ban (April 1st 2004-March 31st 2006) to 2475 in 2 years post ban (April 1st 2006-March 31st 2008). Chow test highly significant for a break point in June 2006 (p=.008, 1 month prior to ban).* *Employee smoking:* *Among cohort of 489, 12% self-reported smoking rates in 2005, 7.5% 2007 (McNemar significant at P < 0.001).* *Among all employees, self-reported smoking rates of 14.3% March-June 2005, 14.8% march-June 2006, 9.4% March-June 2007 (P < 0.0002).* **Attrition details** Not reported *Not reported for staff smoking*	Identified by author(s) *Cannot evaluate individual components of the University of Michigan Smoke Free Hospitals Implementation Plan as they were all implemented simultaneously.* *Smoking status was self reported* **Limitations identified by review team** *No baseline group.* **Evidence gaps/future research recommendations** None reported **Source of funding** Other

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
		Sample characteristics: *not reported* **Baseline comparison** Not reported **Study sufficiently powered?** Not applicable		*prevalence calculations* Not applicable	
Haller (1996) **Authors** *Haller, McNiel & Binder* **Year** 1996 **Aim of study** *To study the effects of a complete smoking ban on a locked psychiatric unit, specifically: what are the staff and patient attitudes toward initiating a total smoking ban on a locked unit with no smoking area or "smoking passes"? How do these attitudes change after a ban had been in effect? What is the ban's impact on the unit milieu?* **Study design** Before-and-after study (with different sample after intervention) **Quality score** + **External validity score** +	**Country** USA *California* **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health **Source population** Patients **Source population demographics** Health status *PATIENTS Diagnosis: Schizophrenia 19% (pre-ban) 32% (post-ban), Mood disorder 48% (pre-ban) 28% (post-ban), Other (pre-ban) 33% (post-ban) 40%* Speciality care *PATIENTS 83% of the patients discharged over the 5 months of the study were civilly committed* Smoking status *PATIENTS Current smoker: Yes 41% (pre-ban) 53% (post-ban), No 59% (pre-ban) 47% (post-ban)* Age *PATIENTS Mean age 44 years (pre-ban) 42 years (post-ban)* Sex *PATIENTS Male 41% (pre-ban) 57% (post-ban)* Ethnicity *PATIENTS White 63% (pre-ban) 71% (post-ban), Non-white 37% (pre-*	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Yes (implementation date not reported, early 1990s)* **When assessed** Before implementation – single time point *chart data 1 month pre-ban* After implementation – multiple time points *chart data 1, 2, 3 and 4 months post-ban* **Where** Mental Health *Locked inpatient unit* **Smokefree coverage** Smokefree building(s) Smokefree grounds **Supporting strategies/ interventions** Pharmacotherapies/NRT *Prescriptions for patients* Other *Staff education to recognize and treat nicotine withdrawal symptoms/cigarette cravings; written information for patients (use of nicotine gum and how to manage cravings)* **Sample size** Total sample *Rev 6: n=27 (pre-ban), n=26 (1 month post-ban), n=30 (2 months post-ban), n=36 (3 months post-ban), n=43 (4 months post-ban) (n=135 total post-ban)* *Sample characteristics = Source population*	**Primary outcomes** Other consequence(s) - objective *Indicators of patient disruption/ward functioning: received p.r.n. medication, secluded, restrained, discharged against medical advice, eloped (chart data retrospectively abstracted). Proportion of 8 hours shifts with and without aggressive behaviour: physical aggression against other people, against objects or against self, verbal aggression (using the Overt Aggression Scale (Yudofsky et al '86), a behavioural checklist routinely completed at end of every 8 hour shift).* **Follow-up periods** Follow-up period(s) *3-5 months* **Method of analysis** Method(s) of analysis *Pre-post comparisons were analysed with t-test (two-tailed). Evaluation of the impact of the ban on objective indices of ward functioning was conducted using chi-square analyses, in which the 1 month pre-ban (pre-test) and each of the first 4 months post-ban were compared (post-tests).*	**Primary outcomes** Relevant results - other *Indicators of patient disruption/ward functioning: A review of chart data for patients discharged from the unit compared data from 1 month before the ban with data from 1, 2, 3 and 4 months after the ban.* *A review of patient chart data showed no significant differences across the five time periods in the proportion of patients who were secluded: 26% (of n=27) patients 1 month prior, 23% (of n=26) patients 1 month post, 20% (of n=30) patients 2 months post, 25% (of n=36) patients 3 months post and 14% (of n=43) patients 4 months post implementation (p<0.05). Nor significant differences in the proportion of patients who were restrained: 19% (of n=27) patients 1 month prior, 15% (of n=26) patients 1 month post, 7% (of n=30) patients 2 months post, 6% (of n=36) patients 3 months post and 7% (of n=43) patients 4 months post implementation (p<0.05).* *There were no significant differences in the proportion of patients who received PRN medications across the five assessment periods: 74% (of n=27) patients 1 month prior, 62% (of n=26)*	**Limitations identified by author(s)** Identified by author(s) *The study was completed in an area with a reputation for "health consciousness" (San Francisco), and only half the patients were current smokers. Smoking rates may differ across the country.* **Limitations identified by review team** *Risk self-selection bias, unvalidated outcome measures, no control group* **Evidence gaps/future research recommendations** Evidence gaps *Studies of smoking bans in psychiatric facilities which do not permit smoking in specified areas or smoking passes* **Source of funding** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	ban) 29% (post-ban) **Recruitment** Recruitment method Not applicable **Population selection criteria** Inclusion criteria *Chart data for all hospitalised patients discharged 1 month before and 1, 2, 3, and 4 months after ban implementation* Exclusion criteria not reported % participation agreement *not applicable* **Potential sources of bias** *patients 78% (pre-ban) 85% (post-ban), staff 81% (pre-ban) 64% (post-ban) participation; chart data for 100% patients* **Setting** *A 16-bed locked inpatient unit in San Francisco, CA, with a 2 week mean length of stay.*	*characteristics. No statistically significant differences in demographic and clinical features between the pre-ban sample and the total post-ban sample.* **Baseline comparison** Not applicable **Study sufficiently powered?** Not reported		*patients 1 month post, 70% (of n=30) patients 2 months post, 61% (of n=36) patients 3 months post and 51% (of n=43) patients 4 months post implementation (p<0.05).* *There were no significant differences across the five time periods in the proportion of patients who were discharged against medical advice: 4% (of n=27) patients 1 month prior, zero (of n=26) patients 1 month post, 20% (of n=30) patients 2 months post, 8% (of n=36) patients 3 months post and 7% (of n=43) patients 4 months post implementation (p<0.05). Nor significant differences in the proportion of patients who eloped: zero (of n=27) patients 1 month prior, zero (of n=26) patients 1 month post, 7% (of n=30) patients 2 months post, 3% (of n=36) patients 3 months post and zero (of n=43) patients 4 months post implementations (p<0.05).* *Proportion of 8 hours shifts with and without aggressive behaviour: There was no significant change in the proportion of 8 hour shifts in which physical aggression against other people or physical aggression against objects occurred over the 1 month preceding the ban and the 4 months following the ban. The proportion of 8 hour shifts in which physical aggression against self occurred increased during the second month (from 1.2% to 17.9%), and returned to baseline 3 months (1.2%) and 4*	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
				months (14.3%) following the ban (Chi-square=33.77, df=4, p<0.01). The proportion of 8 hour shifts in which verbal aggression occurred decreased 1 month following the ban (from 35.7% to 21.4%), increased during the second month (60.7%), and returned to baseline at 3 (23.8%) and 4 months (35.7%) following the ban (Chi-square=20.45, df=4, p<0.01). [Direction of effect favours smokefree] **Attrition details** Not applicable	
Hempel (2002) **Authors** *Hempel et al* **Year** 2002 **Aim of study** *To determine the effects of a total smoking ban on the health and behaviour of forensic patients in a maximum security psychiatric hospital* **Study design** Before-and-after study (with same sample after intervention) **Quality score** + **External validity score** +	**Country** USA **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health **Source population** Patients **Source population demographics** Health status *Patients are under one of the following designations: incompetent to stand trial, not guilty by reason of insanity (NGRI), or the civilly committed who are found to be manifestly dangerous* **Recruitment** Recruitment method *Retrospective chart review performed on 140 patients who had been resident on the units for four weeks prior to and four weeks post implementation* **Population selection criteria** Inclusion criteria *To be included, a patient must have*	**Method of allocation** Not applicable Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *December 1st 1998* **When assessed** Before implementation – single time point *Four weeks prior to implementation* After implementation – single time point *Four weeks post implementation* **Where** Mental Health **Smokefree coverage** Smokefree building(s) Other *States 'on hospital property'* **Supporting strategies/ interventions** Pharmacotherapies/NRT Other *Education about potential symptoms of withdrawal* *Any tobacco product found on patients would be considered contraband, seized and appropriate actions taken against the individual*	**Primary outcomes** Other consequence(s) - subjective *DISRUPTIVE BEHAVIOURS* *Verbal aggression: Verbal behaviour viewed by staff or physician as hostile or threatening and directed towards a person or object without the application of physical force. This was to be recorded in the patient's chart by staff or physician.* *Physical aggression: Behaviour viewed by staff or physician as hostile or threatening toward a person or object with the application of physical force. This was to be documented in the patient's chart.* *Loss of privileges: Behaviours observed by staff or physician, whether physical or verbal, resulting in physician orders mandating a loss of privilege.* Other consequence(s) - objective *DISRUPTIVE BEHAVIOURS*	**Primary outcomes** Relevant results - other *SICK CALLS* *There were non-significant post-ban declines in the non-smokers, Z = -0.62, and in the light smokers Z = -0.36. There was a significant 54% decline in the moderate smokers, Z = -2.07, p=0.038. There was a significant 61% decline in the heavy smokers, Z = -2.67, p=0.008.* *DISRUPTIVE BEHAVIOURS* *There was a non-significant post-ban decline in disruptive behaviours among the non-smokers, Z = -0.26. There was a non-significant increase among the light smokers, Z = -0.41. There was a significant 49% decline in disruptive behaviours among the moderate smokers, Z = -2.24 p=0.025 and heavy smokers, Z = -2.71, p=0.007* *The only significant change in individual components of the 'disruptive behaviours' was a post ban*	**Limitations identified by author(s)** Identified by author(s) *The design of this study provided little detail about the first few days of smoking cessation when withdrawal signs and symptoms generally reach their peak* *Data still would have been more complete if nicotine replacement therapy had been systematically recorded.* *As a result of its archival nature, the study focused on observable incidents, recorded in the medical records.* *Due to some cigarette smuggling, the researchers could not be certain of the exact degree and timing of tobacco abstinence.* **Limitations identified by**

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	resided on the unit at least four weeks prior to and four weeks after the start of the study Exclusion criteria not reported **Potential sources of bias** **Setting** *A maximum security forensic campus (Vernon Campus) of the North Texas State Hospital*	**Sample size** Total sample *140 patients.* *Sample characteristics: 86% male, 14% female; 50% Black, 31% White, 16% Hispanic, 2% Asian. Aged 19- 75 years (mean 39 years). Almost all suffered from a disorder that resulted in psychosis at some time prior to or during their hospitalization: most common diagnosis was schizophrenia, paranoid type; remaining diagnosed with another form of schizophrenia, schizoaffective disorder, bipolar disorder, delusion disorders or major depression.* *Four groups: (i) non-smoker (n=30), (ii) light (n=30), 1-9 cigs/day, (iii) moderate (n=34), 10-18 cigs/day, (iv) heavy (n=46), ≥19 cigs/day. Smokers consumed mean 14 cigs/day, usually filtered.* **Baseline comparison** Not applicable **Study sufficiently powered?** Not applicable	*PRN for agitation: Instances of a medication specifically prescribed on the physician order sheet for ''agitation.'' Agitation was commonly noted as irritability or restlessness as observed by the staff or verbalized by the patient to staff.* *PRN for aggression: Instances of a medication specifically prescribed on the physician's order sheet for what was characterized as ''verbal'' or ''physical'' aggression.* *Restraint and seclusion: Due to their similarity and low numbers of occurrence, these were combined into one category. Seclusion was operationally defined as mandatory restriction of a patient either to a quiet room or other designated area of the hospital ward under observation by designated staff. Restraint was defined as mandatory restriction of a patient in a restraint room with the application of leather restraints and/or chemical sedation. Both restraint and seclusion were ordered by a physician and documented in physician orders.* *NON-DISRUPTIVE BEHAVIOURS* *Sick call: As documented in the physician's orders, a visit of the patient to the medical doctor for a physical complaint. Common complaints were upper and lower*	*decline in verbal aggression in heavy smokers, Z = -2.12, p=0.034. The post ban decline in verbal aggression in non smokers closely approached significance, Z = -1.91, p=0.56. The only suggestion of adverse changes were non-significant increases in seclusion/restraint in light smokers and in PRN medications for aggression in light and heavy smokers* **Attrition details** Not applicable	**review team** **Evidence gaps/future research recommendations** Future research recommendations *Future studies of a smoking ban affecting this sort of population might provide additional insight through recording the subjective responses of the patients before and during the withdrawal period.* *As the smoking ban affected hospital staff at least as much as the patients, systematically recording staff expectations and responses would add to the total picture of a psychiatric hospital smoking ban and its consequences.* *There remains a need for prospective studies of psychiatric hospital smoking bans, including effects on both staff and patients, as well as physical data on nicotine consumption.* **Source of funding** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
			respiratory tract difficulties, gastrointestinal difficulties, and pain. *Weight: Weights were recorded weekly for all patients. A mean weight was obtained for the ten-week pre-test period as well as a mean weight for the ten week post-test period.* **Follow-up periods** Follow-up period(s) *Four weeks, with the exception of weight which was 10 weeks post ban* **Method of analysis** Method(s) of analysis *Sick calls and disruptive behaviours pre and post ban were compared using the Wilcoxon signed ranks test*		
Hudzinski (1990) **Authors** *Hudzinski & Frohlich* **Year** 1990 **Aim of study** *To research how tobacco smoke affects employees or patients while at the institution, the acceptance of a no-smoking policy before and after its implementation, and the consequences of the policy on the smoker (particularly confined to responses of employees).* **Study design** Before-and-after study (with same sample after intervention)	**Country** USA *Louisiana* **Urban/Rural setting** Not reported **Secondary Care Setting** Both **Source population** Staff *Employees and staff physicians* **Source population demographics** None reported **Recruitment** Recruitment method *Questionnaire (including statement of purpose and completion instructions) mailed to all employees and to +2000 randomly selected patients. The same individuals were re-contacted and invited to respond to a similar questionnaire 6 and 12 months later.*	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented 1986* **When assessed** Before implementation – single time point *6 months pre-ban* After implementation – multiple time points *6 months post-ban and 12 months post-ban* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) Ban exclusions *Patient smoking permitted on the acute psychiatry inpatient unit by physician approval* Other *A "comprehensive campus-wide smokefree environment"*	**Primary outcomes** Other consequence(s) - subjective *Staff smoking behaviours (smoking status, cigarettes per day, smoking during/after work hours); Staff cessation intention and behaviour (all self-reported using Likert-scales)* **Follow-up periods** Follow-up period(s) *12 months and 18 months* **Method of analysis** Method(s) of analysis *Responses (nominal and ordinal data) were coded and the "data were analyzed using survey statistical methods (Rosenberg 1986)". All physician data were collapsed into the employee response category.*	**Primary outcomes** Relevant results - other *Smoking status (staff): Six months before and* *after the policy was implemented, 22% and 20% respectively, of hospital staff self-reported that they smoked, and 12 months after the policy was implemented this was reduced to 14% of hospital staff (Chi-square=11.53, p<0.003).* *Cigarettes per day (staff): 12 months after the policy was implemented, fewer cigarettes were smoked in comparison to the previous year's data; after 12 months, 81% of smokers reported using <8 cigarettes per day (no other data reported).* *Smoking cigarettes during and after work hours (staff): "Approximately*	**Limitations identified by author(s)** Identified by author(s) *Uncontrolled factors may have influenced the results; repetitive questionnaires may have sensitized employees and patients in their responses; smoking cessation programs may have influenced employees' attitudes rather than the policy itself or the national trend in stopping smoking.* **Limitations identified by review team** *Same sample but may have become desensitised to questionnaire; no control group* **Evidence gaps/future research recommendations** None reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Quality score + **External validity score** +	**Population selection criteria** Inclusion criteria *All employees (including medical and scientific staff)* Exclusion criteria not reported % participation agreement *Employees: 46% (pre-ban), 38% (6m post-ban), 16% (12m post-ban)* **Potential sources of bias** *low staff response rate (same sample): 46% (pre-ban), 38% (6m post-ban), 16% (12m post-ban); no patient response rate reported; exclusion criteria not reported for patients; no data for non-responders* **Setting** *A health care institution (clinic and medical foundation) with inpatient units employing staff physicians and psychologists*	**Supporting strategies/ interventions** Implementation committee *Smoke-Free Task Force (included clinicians, psychologists, and administrative personnel from public affairs and employee relations departments)* **Sample size** Total sample *Employees: n=1946 (pre-ban), n=1608 (6m post-ban), n=684 (12m post-ban)* *Sample characteristics: At 12 months follow-up: 18% physicians 82% other employee; 4% <35years, 29% 35-44 years, 27% ≥45 years; 29% male.* **Baseline comparison** Not applicable **Study sufficiently powered?** Not reported		*one-fourth" of staff smokers self-reported that they no longer smoked cigarettes during work 6 months after policy implementation and 12 months after policy implementation (no data given). "Approximately 40%" of staff smokers self-reported that their cigarette consumption after work hours remained unchanged at both 6 months after policy implementation and 12 months after policy implementation (no data given).* *Cessation intentions/behaviours (staff): At 6 months pre-ban, 28% staff smokers reported that they intended to stop smoking if the institution implemented a policy; 12 months post-ban "most who expressed that interest had attempted to do so" (no data given). 25% staff smokers reported that they physically tried to stop smoking at 6 months post-implementation and 21% at 12 months post-implementation.* **Attrition details** Not applicable	**Source of funding** Not reported
Joseph (1993) **Authors** *Joseph, Nichol & Anderson* **Year** 1993 **Aim of study** *To address the potential impact of a policy banning smoking and smoking interventions on the results of treatment for alcohol and*	**Country** USA **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health **Source population** Patients **Source population demographics** None reported **Recruitment** Recruitment method	**Method of allocation** Investigator did not assign exposure *Based on date of admission* Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place **When assessed** Before implementation – single time point *January 1st 1988-May 19th 1988* After implementation – single time point *July 19th 1988-December 31st 1988* **Where**	**Primary outcomes** Other consequence(s) - objective *Smoking habits at admission and follow up* **Follow-up periods** Follow-up period(s) *Time to interview for intervention participants averaged 10.8 months, 16.2 months for control* **Method of analysis** Method(s) of analysis *Chi-square tests for comparison of*	**Primary outcomes** Relevant results - other *65% of smokers described their smoking habits at the time of interview as "the same" as on hospital admission. Twenty-two percent reported "less" smoking, and 9% reported "more" smoking than on admission (differences between intervention and control groups not significant).*	**Limitations identified by author(s)** Identified by author(s) *Fairly high non-response rate* *Use of a historic control is limited by several forms of bias and does not establish causality* *The validity of self-reported smoking status in post-*

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
drug use **Study design** Before-and-after study (with different sample after intervention) **Quality score** + **External validity score** +	*All eligible patients charts screened* **Population selection criteria** Inclusion criteria *Male patients aged 18-65 hospitalised during the control or intervention period* Exclusion criteria *Patients admitted between May 20, 1988 and July 18, 1988 were not considered because the program site moved during this period and patients were subjected to two different smoking policies.* *Female patients constituted less than 5% of admissions and were therefore not included.* *Patients without a telephone number at the time of hospitalization were excluded.* *Patients with a length of stay less than 1 week were excluded because of insufficient exposure to the smoking-cessation intervention.* *If patients' charts could not be located they were excluded.* % participation agreement *154/176 intervention (87.5%)* *160/168 control (95.2%)* **Potential sources of bias** *Well described and the majority of participants took part.* **Setting** *The Minnesota Veterans Affairs Medical Centre Drug Dependency Treatment Programme*	Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/ interventions** Other *Patients informed of policy and cessation programme prior to admission. They were required to agree in writing to nicotine abstinence during treatment and asked to abstain from smoking even when off site.* **Sample size** Total sample *All patients n=314, Respondents n=197* Control/Comparison sample *n=160* Intervention sample *n=154* Sample characteristics (respondents): *all male patients; 18-65 years, mean 39.9 years; mean length of stay 22.4 days; 79% smoker on admission; 81% high school graduate; 45% divorced/separated; 61% unemployed on admission; 49% no medical conditions, 12% cardiovascular disease, 7% lung disease, 11% liver disease, 20% psychiatric disease.* **Baseline comparison** No differences btw groups **Study sufficiently powered?** ++ *P<0.05*	*proportions, Student's t-tests for continuous variables.*	*Among respondents who smoked at the time of admission (n = 152), 10 said they were not current smokers at the time of follow-up interview: 7 in the intervention group and 3 in the control group. Eighteen patients quit smoking for at least 1 week after discharge from the hospital: 6% (5 of 83) in the control group and 19% (13 of 69) in the intervention group (p = .02). Of 13 patients who quit smoking in the intervention group, 10 did so during the hospitalization.* *If non-respondents are assumed to be continuing smokers, the differences in rates of "quitting smoking for >1 week" and "not currently smoking" are not statistically significant.* **Attrition details** Number lost to follow-up *62 intervention group, 55 control group* Attrition group differences *Not significant*	*cessation clinic populations is controversial and patients may have over-estimated quit rates.* *Patients may have declined admission because of the restrictive smoking policies* **Limitations identified by review team** **Evidence gaps/future research recommendations** Future research recommendations *More careful studies of drug and alcohol treatment outcomes under different smoking interventions is needed* **Source of funding** Other

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Kempf (1996) **Authors** *Kempf & Stanley* **Year** 1996 **Aim of study** *To assess the effect of smoke free policy on patient intake and retention in residential treatment setting* **Study design** Randomised controlled trial **Quality score** + **External validity score** -	**Country** USA **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health **Source population** Patients Staff Specific Ward(s)/Department(s) *Only one treatment group experienced a full site ban* **Recruitment** Recruitment method *All adolescents entering the treatment programme* **Population selection criteria** Inclusion criteria *Adolescents who entered the programme during a one year period February 1994-February 1995* Exclusion criteria not reported % participation agreement *210 applied for admission to the programme* *4 not admitted due to inappropriateness and referral to other treatment* *48 not admitted due to failure to show for intake appointment, decision not to seek admission during initial phone contact or refusal of assigned treatment programme (n=7)* *158 adolescents admitted, smoking data available for 155* **Potential sources of bias**	**Method of allocation** Investigator did not assign exposure *Randomly assigned to programme on entering the campus* Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *(implementation date not reported)* **Where** Mental Health **Smokefree coverage** ***Intervention campus*** Smokefree building(s) Smokefree doorways/entrances Smokefree grounds ***Control campus:*** Smokefree building(s) *Designated outdoor areas for smoking* **Supporting strategies/ interventions** Cessation support *Medical support for nicotine addiction available to all residents if nicotine abstinence is part of the addiction treatment plan* **Sample size** Total sample *n=155 adolescents (figure cannot be broken down by random allocation to intervention or control)* Sample characteristics: *Age range 13-17 years, average 15.7 years; 82% male; 40% African-American, 32% Hispanic; 28% Caucasian; average highest school grade completed 8th; 41% have health insurance; 80% have an arrest record (other than traffic offences); 85% (n=132) smoke cigarettes, of these 25% smoke 1-5 cigs/day, 36% smoke a half pack (6-15 cigs)/day; 39% smoke a pack or more (16-35 cigs)/day;*	**Primary outcomes** Other consequence(s) - objective *Recruitment into treatment programme* *Retention rates at 2 days and 2 weeks* **Follow-up periods** Not applicable **Method of analysis** Not reported **Was Intention To Treat (ITT) analysis conducted? (intervention QA)** Not applicable	**Primary outcomes** Relevant results - other *2% (n=2) of 105 adolescents assigned to the tobacco-free programme declined admission compared to 5% (n=5) of those assigned to the other programme.* *Pre allocation, 17% of 105 adolescents assigned to the tobacco-free programme declined admission compared to 22% of those assigned to the other programme, this difference was non-significant (p=0.38)* *Retention at 2 days is slightly higher in the programme without a smoke free policy (95% vs 91%), although this difference is non-significant (p=0.43)* *Retention at 2 weeks is slightly higher in the programme with a smoke free policy (80% vs 74%), although this difference is non-significant (p=0.37)* *Heavy smokers were much more likely to drop out in the first 2 days of treatment (p=0.005), although were equally likely to drop out of either programme (p=1.0)*	**Limitations identified by author(s)** None identified by author(s) **Limitations identified by review team** **Evidence gaps/future research recommendations** Future research recommendations *Replication of the study in an adult residential treatment setting* **Source of funding** Government

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	Setting *The New Jersey Substance Abuse Treatment Campus, a 350 bed residential substance abuse treatment facility which incorporates a central intake unit and around the clock medical services.*	*Drug of preference: 63% marijuana/hashish, 17% heroin/cocaine, 13% alcohol, 7% other.* **Baseline comparison** Yes differences btw groups *The only statistical difference between groups was the proportion of African-Americans (more in the programme without a smoking policy, p=0.009)* **Study sufficiently powered? (intervention QA)** -			
Kvern (2006) **Authors** *Kvern* **Year** Unpublished *Report (2005) and WCToH poster presentation (2006)* **Aim of study** *To evaluate the processes used to implement smokefree grounds policy* **Study design** Before-and-after study (with different sample after intervention) *Policy compliance - observation* **Quality score** - **External validity score** +	**Country** Canada *Winnipeg* **Urban/Rural setting** Not reported **Secondary Care Setting** Not Mental Health (Acute and/or Maternity) **Source population** Staff **Source population demographics** None reported **Recruitment** Not applicable **Population selection criteria** Inclusion criteria not applicable *Most data from observation or health authority records* Exclusion criteria not applicable *As above* **Potential sources of bias** Not applicable **Setting** *A number of Winnipeg Regional Health Authority operations including Deer Lodge Centre (a long-term care facility), Health Sciences Centre (a tertiary care facility),*	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Smokefree grounds implemented 5 Jul 04* **When assessed** Before implementation – single time point *Policy compliance observation (31 May – 09 Jun '04)* After implementation – single time point *Policy compliance observation (26 Jul – 9 Aug '04); Support for inpatients (NRT use) (Jul-Sep '04)* After implementation – multiple time points *Policy compliance security contacts (Jul '04, Aug '04, Sep '04)* **Where** Not Mental Health *Smokefree grounds policy excludes mental health services and home-based services* **Smokefree coverage** Smokefree building(s) Smokefree doorways/entrances Smokefree grounds **Supporting strategies/ interventions** Written policy(ies) *Smokefree Policy; a Comprehensive*	**Primary outcomes** Compliance - objective *Observation schedule to count number of individuals smoking on the property (1 individual, made all observations at both time points); Number of contacts security personnel have with people smoking on facility grounds; Number of complaints received about policy (data records).* Other consequence(s) - objective *NRT support for in-patients (volume of patches and gum used); Information sheet for patients and general public distribution (print requests); Support for staff (volume of smoking cessation medication costs reimbursements, from data records)* **Follow-up periods** Follow-up period(s) *2 months (Policy compliance – observation)*	**Primary outcomes** Relevant results - compliance *Number of individuals smoking on the property: Over 6 days of observation covering 5 locations and 4 standard break-times, one month pre-policy n=314 people (tertiary care centre) and n=115 people (long-term care facility) were observed smoking on facility grounds. Post-policy, at the same times and locations one month later, the number of people observed smoking on facility grounds had reduced to n=32 people (tertiary care centre) and n=6 people (long-term care facility).* *Number of contacts security personnel have with people smoking on facility grounds: During the first month of smokefree grounds implementation, the mean number of contacts per day security personnel had with smokers on the tertiary care facility grounds was 11.95, this reduced to 5.40 contacts/day the following month, and further reduced to 4.89 contacts/day during the third month post-*	**Limitations identified by author(s)** None identified by author(s) *NB: not written as an academic journal article where limitations would be expected* **Limitations identified by review team** *Limited detail for decision but broad range of mostly cross-sectional measures in source settings.* **Evidence gaps/future research recommendations** None reported *See study limitations above, recommendations are for policy implementation, not research* **Source of funding** Government

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	community sites, Saint Boniface General Hospital and other long-term care facilities.	*Communications plan* Implementation committee *Smokefree Policy Working Group* Posters/signage *Signage; no-smoking symbols painted on pavements + driveways* Staff meetings Staff letters/payslip notes *Posted notices, pay stub inserts, facility newsletters* Cessation support *Staff: Information resources, on-site cessation groups* Pharmacotherapies/NRT *Staff: reimbursement for smoking cessation medication* *In-patients: prescribing aids to assist appropriate NRT* Temporary abstinence support *In-patients* Moved ashtrays/shelters *To the site periphery* Staff training *Admissions training for new staff (inform policy, identify NRT needs); Security staff trained to address non-compliance with a 'graded approach' – used info sheet as an aid, ask to extinguish cigarette or move off-site.* Other *Media (paid and earned) to inform public and patient groups; health organisations' websites; bilingual information sheet for inpatients and general public* **Sample size** Total sample *Data reported from a range of hospitals and care facilities.* **Baseline comparison**		*implementation.* *Sub-group differences: The number of contacts security personnel had with staff smokers reduced over the first 3 months of smokefree grounds implementation from 22 to 8 to 2. Contacts with in-patient smokers changed from 65 to 14 to 16; contact with visitor smokers reduced from 173 to 86 to 26; and contacts with contractor smokers reduced from 3 to 0 during the first 3 months of smokefree grounds.* *Number of complaints received about policy: Three months after smokefree grounds policy implementation, the long-term care facility reported 1 complaint about non-compliance, the tertiary care facility reported 3 complaints and quality managers and patient representatives reported having had "few, if any" complaints.* Relevant results - other *NRT support for in-patients: From a pre-implementation utilisation level of nil for NRT support for in-patients, during the first 3 months of smokefree grounds, one hospital reported using just under 150 NRT patches and a tertiary care facility reported using approximately 550 NRT patches and 650 pieces of NRT gum.* *Bilingual information sheet for patients and general public, print requests: Post-policy implementation, acute care facilities made 3 orders for a total 1500 copies of the bilingual*	

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		Not applicable **Study sufficiently powered?** Not reported		*information sheet for patients and general public; community area offices made 5 orders for 625 copies and long-term care facilities made 2 orders for 100 copies.* *Smoking cessation medication costs reimbursement for staff smokers: After smokefree grounds policy implementation, the tertiary care facility reported 50 requests for reimbursement of staff's smoking cessation medication costs (total staff n=5600), the long-term care facility reported 7 requests for reimbursement of staff's smoking cessation medication costs (total staff n=970), and Community care reported 9 reimbursement requests.* **Attrition details** Not applicable	
Martínez (2008) **Authors** *Martínez et al.* **Year** 2008 **Aim of study** *To identify the extent of smoking and compliance with tobacco restrictions among employees where a smoke-free policy was progressively introduced* **Study design** Interrupted time series *4 surveys between 2001-2006* **Quality score**	**Country** Spain **Urban/Rural setting** Not reported **Secondary Care Setting** Not Mental Health (Acute and/or Maternity) **Source population** Staff **Source population demographics** Smoking status *"The sample sizes were estimated taking into account the smoking prevalence among healthcare professionals in Catalonia in 1998 (35%) and assuming a 95% confidence level and an error ±4." [p.89]*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *A smoke free policy was introduced progressively from '97: in '03, smoking was only allowed in 1 smoking area, exclusively for employees. In Jul '05, the Hospital became entirely smoke-free.* **When assessed** After implementation – multiple time points *2001, 2002 and 2004 (all pre-full ban implementation) 2006 (post-full ban implementation)* **Where** Not Mental Health **Smokefree coverage** Other	**Primary outcomes** Compliance - subjective *Number of hours exposed to environmental tobacco smoke during their hospital duty; whether employees smoked in 12 selected areas (e.g. nursing rest areas, cafeteria, offices, and lifts) (both self-report)* Other consequence(s) - subjective *Smoking prevalence; Smokers: number of cigarettes smoked per day, previous attempts to quit and readiness to quit smoking (all self-report)* **Follow-up periods** Not applicable **Method of analysis** Method(s) of analysis	**Primary outcomes** Relevant results - compliance *Number of hours exposed to environmental tobacco smoke during their hospital duty:* *A smokefree policy was introduced progressively from 1997: in 2003, smoking was only permitted in one smoking area exclusively for employees, and in July 2005 the Hospital became entirely smoke-free. In a series of annual cross-sectional surveys from 2001-2006, hospital staff were asked to estimate the number of hours they are exposed to environmental tobacco smoke during their shift. The proportion of*	**Limitations identified by author(s)** Identified by author(s) *Repeated cross-sectional and comparable surveys, therefore some selection bias due to selective participation is probable.* *The use of self-reported smoking status can cause errors in classification in intervention studies of smoking cessation, but it is an adequate form of classifying smokers in observational*

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+ **External validity score** +	**Recruitment** Recruitment method *Not fully reported. (An interviewer administered questionnaire to pre-selected employees.)* **Population selection criteria** Inclusion criteria not reported *Data were obtained from a 'representative sample' of employees of the Catalan Institute of Oncology* Exclusion criteria not reported % participation not reported **Potential sources of bias** *Not described - only a power calculation.* **Setting** *The Catalan Institute of Oncology, a Comprehensive Cancer Centre in Barcelona*	*the Hospital became "entirely smoke-free" in 2005* **Supporting strategies/ interventions** Closure of smoking rooms Staff training *For nurses: tobacco control educational and training courses* **Sample size** Total sample *n=188 in 2001, n=186 in 2002, n=206 in 2004, n=237 in 2006* *Sample characteristics: Occupation 2001 20% doctors 34% nurses 56% administrative employees 35.3% other; 2002 24.3% doctors 32.3% nurses 46.7% administrative employees 30.7% other; 2004 17.2% doctors 30% nurses 31.3% administrative employees 47.8% other; 2006 15.2% doctors 32.6% nurses 37% administrative employees 35.7% other.* *Smoking status: 2001 34.5% smokers 38.3% never smokers 27.1% former smokers; 2002 32.8% smokers 44.6% never smokers 22.6% former smokers; 2004 34% smokers 37.9% never smokers 28.2% former smokers; 2006 30.6% smokers 39.4% never smokers 30.1% former smokers.* **Baseline comparison** Not applicable **Study sufficiently powered?** +	*Computed the proportion of participants according to their response using the Statistical Package for Social Sciences 11.0*	*employees who reported working in a smokefree environment (i.e. reported exposure to ETS for zero hours during their shifts) increased from 33.0% (95% CI: 26.2-39.7) in 2001 (pre-implementation) to 91.4% (95% CI: 87.3-94.6) in 2006 (1 year post-implementation). One year after smoke-free implementation, some hospital employees still reported being exposed to ETS during their shifts: 5.3% (95% CI: 2.4-8.1) were exposed for <1 hour in 2006 (a decrease from 46.3% in 2001 (95% CI: 39.1-53.4)); and 1% (95% CI: 0-2.2) were exposed for 1-4 hours in 2006 (a decrease from 18.1% in 2001 (95% CI: 12.6-23.6)).* *2001: None 33% (95% CI: 26.3-39.7) <1h 46.3% (95% CI: 39.1-53.4) 1-4h 18.1% (95% CI: 12.6-23.6) >4h 2.1% (95% CI: 0.5-4.14)* *2002: None 31.2% (95% CI: 24.5-37.8) <1h 47.3% (95% CI: 40.1-54.5) 1-4h 17.2% (95% CI: 1.86-22.7) >4h 4.3% (95% CI: 1.38-7.21)* *2004: None 55.3% (95% CI: 48.4-62.2) <1h 38.6% (95% CI: 31.8-45.4) 1-4h 5.5% (95% CI: 2.3-8.8) >4h 0.5% (95% CI: 0.5-1.4)* *2006: None 91.4% (95% CI: 87.3-94.6) <1h 5.3% (95% CI: 2.4-8.1) 1-4h 1% (95% CI: 0-2.2) >4h 0%* *Whether employees smoked in selected smokefree areas: In 2001 "few smokers" (no data given) reported to have smoked inside the nursing rooms and in 2006 no*	*studies. Furthermore, the questionnaire was interviewer administered, and this methodology has shown higher estimates of sensitivity and specificity than self-administered questionnaires.* **Limitations identified by review team** **Evidence gaps/future research recommendations** None reported **Source of funding** Other

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				employee respondents reported smoking inside the nursing rooms. In 2004 and 2006, no employees reported smoking in the smoke-free cafeteria and the employees' rest areas. Relevant results - other *Smoking prevalence: Employee smoking prevalence had slightly decreased from 34.5% (95% CI: 27.7-41.2) in 2001 (before the complete ban) to 30.6% (95% CI: 24.7-36.4) in 2006 (after the complete ban). Sub-group differences: Smoking prevalence among doctors decreased from 20.0% in 2001 (95% CI: 6.7-33.2) before the complete ban implementation to 15.2% in 2006 (95% CI: 2.9-27.4), after the complete ban implementation; decreased among nurses, from 34.0% in 2001 (95% CI: 24.4-43.5) to 32.6% in 2006 (95% CI: 22.8-42.3); decreased among administrative employees, from 56.0% in 2001 (95% CI: 36.5-75.4) to 37.0% in 2006 (95% CI: 18.7-55.2); and remained the same among Other employees at 35.3% in 2001 (95% CI: 19.1-51.2) and 35.7% in 2006 (95% CI: 21.2-50.2).* *Smokers: Number of cigarettes smoked per day: One year after the complete ban was implemented, in 2006 48.8% employees smoked <10 cigs/day (95% CI: 35.3-60.7), an increase from 30.8% in 2001 (95% CI: 24.8-51.19). In 2001, 61.5% of employee smokers smoked 10-20 cigs/day (95% CI: 47.7-74.3),*	

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				decreasing to 37.2% in 2006 (95% CI: 24.6-49.3), a year after complete ban implementation. Hospital employees smoking >20 cigs/day increased between 2001 (pre-implementation of the complete ban) and 2006 (post-implementation) from 7.7% (95% CI: 0.7-13.2) to 14.0% (95% CI: 5.1-22.8). *Smokers: Previous attempts to quit: Hospital employee smokers reporting having attempted to quit smoking at least once decreased from 64.6% in 2001 (95% CI: 52.0-76.0), before the implementation of a complete ban to 42.4% in 2006 (95% CI: 29.8-55.0), 1 year after the implementation of a complete ban.* *Smokers: Readiness to quit: Hospital employee smokers expressing readiness to quit increased slightly from 40.3% in 2001 (95% CI: 28.4-52.2), before the implementation of a complete ban to 58.6% in 2006 (95% CI: 55.4-61.8), 1 year after the implementation of a complete ban.* **Attrition details** Not applicable	
Matthews (2005) **Authors** *Matthews et al.* **Year** 2005 **Aim of study** *To evaluate implementation of a smoking ban on an acute crisis stabilization*	**Country** USA *North Carolina* **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health **Source population** Patients Staff	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented 21 Oct '02* **When assessed** Before implementation – single time point *Clinical data 3 months pre-ban; other data not reported*	**Primary outcomes** Compliance - subjective *Staff: anticipating/reporting an increase in patients' smoking-related contraband* Compliance - objective *Clinical data patients: number of instances of smuggling smoking-related contraband* Other consequence(s) - objective	**Primary outcomes** Relevant results - compliance *Data staff: instances of contraband* *Pre-implementation, 2 of the 14 nursing staff respondents anticipated an increase in patients' smoking-related contraband, there was an increase to 7 of 13 respondents reporting an increase in contraband post-implementation (p=0.05).*	**Limitations identified by author(s)** Identified by author(s) *Diagnostic differences in the patient populations before and after implementation of the smoking ban; as patients only remain on unit for up to 3 days, cannot comment longer period benefits. In addition, the*

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
(psychiatric) unit for men **Study design** Before-and-after study (with different sample after intervention) **Quality score** - **External validity score** -	*Nursing staff* Specific Ward(s)/Department(s) *Male acute crisis stabilization unit* **Source population demographics** Health status *Approx. 95% are admitted to the unit involuntarily* Sex *100% male* None reported *Staff* **Recruitment** Not applicable **Population selection criteria** Inclusion criteria not reported *(staff survey)* Inclusion criteria not applicable *(clinical data)* Exclusion criteria not reported % participation agreement *(staff survey) - Staff 58% (pre-ban) 54% (post-ban)* % participation not reported *(clinical data) not relevant* **Potential sources of bias** *Not applicable for patient data (no recruitment, data taken from records); No inclusion/exclusion for staff, low participation rate: 58% (pre-ban) 54% (post-ban)* **Setting** *An 18-bed acute crisis stabilization unit where all male patients are first admitted, for up to 3 days, by which time patients are either discharged or referred to the male acute treatment unit. The unit is within Dorothea Dix State Psychiatric Hospital, which provides care to*	After implementation – single time point *Clinical data 3 months post-ban; other data not reported* **Where** Mental Health **Smokefree coverage** Not reported *Described as "smoking ban"* **Supporting strategies/ interventions** Cessation support *Patients - education about nicotine addiction and withdrawal* Pharmacotherapies/NRT *Patients - given nicotine gum (up to 12 mg per day was typically prescribed) or patches (offered in 7 mg, 14 mg, or 21 mg strengths (depending on the number of cigarettes the patients had reported smoking prior to admission)) to ease withdrawal symptoms.* **Sample size** Total sample *Patients n=420 admissions (pre-ban) n=428 admissions (post-ban)* *Sample characteristics: 100% males. There were no statistically significant differences between the pre- and post-ban patient groups related to the number of admissions, average daily census, or average patient age pre- and post-implementation. A statistically significant difference was found in the diagnostic composition of the patient groups before and after implementation (Chi-square=45.6, df=2, p<0.001). The authors reanalysed the data, combining two categories to assess whether a shift in diagnostic practices had occurred. A statistically significant difference remained (Chi-square=7.76, df=1, p<0.01).*	*Clinical data patients: number of patients who required seclusion or restraint; the number of episodes of seclusion or restraint; number of patients who committed at least one episode of assault or self-harm; number of episodes of assault or self-harm.* *Data staff: absenteeism (the number of callouts (i.e., scheduled staff not coming in for their shift))* **Follow-up periods** Follow-up period(s) *6 months* **Method of analysis** Method(s) of analysis *Categorical data by Chi Square except in cases of a low frequency in one of the cells, when Fischer's exact (two-tailed) test was substituted.* *Continuous data were assessed using a Student's t test.*	*[Direction of effect does not support smokefree]* *Clinical data patients: No significant differences were found between the 3 months before and 3 months after the ban was implemented related to the total number of instances of contraband.* Relevant results - other *Clinical data patients: No significant differences were found between the 3 months before and 3 months after the ban was implemented related to the total number of patients who required seclusion or restraint; to the total number of patients who committed at least one episode of assault or self-harm; or to the total number of episodes of assault or self-harm. A significant difference was found in the number of episodes of seclusion or restraint between the 3 months before and 3 months after the ban was implemented (Chi-square = 7.11, df=1, p<0.01), however one non-smoker patient was responsible for nine episodes of restraint during the post-ban period; when that patient was excluded from the analysis, no significant difference existed (Chi-square =1.74, df=1, not significant). (No further data reported.) Results in favour of smokefree.* *Data staff: absenteeism* *No significant difference was found in the number of callouts (i.e., scheduled staff not coming in for their shift) in*	*patient sample consisted solely of men, 95% of whom were involuntarily committed. Finally, staff perceptions of increased contraband, not supported by the data, may suggest problems with data collection.* **Limitations identified by review team** *Paper lacks detail on methods/analysis to answer this* **Evidence gaps/future research recommendations** Future research recommendations *To determine whether there are any post-discharge benefits or possible risks from abrupt smoking cessation in acute psychiatric patients.* **Source of funding** Not reported

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	people in the south central region of North Carolina. Approx. 3,000 patients (1,800 men, 1,200 women) are admitted to adult psychiatry service per year (approx. 95% involuntarily).	*Nursing staff n=14 (pre-ban) n=13 (post-ban)* **Baseline comparison** Not applicable **Study sufficiently powered?** Not reported		*the 3 months before the ban was implemented (36/252 shifts reported at least 1 callout) and the 3 months after the ban was implemented (38/252 shifts reported at least 1 callout). No further statistical information is available. Results in favour of smokefree.* **Attrition details** Not applicable	
Nagle (1996) **Authors** *Nagle, Schofield & Redman* **Year** 1996 **Aim of study** *To describe the type and location of smokers on the grounds of smoke-free public hospitals and to observe the impact of introducing smoke-free signs in outdoor areas of the hospital grounds.* **Study design** Before-and-after study (with different sample after intervention) Non-participant observation **Quality score** + **External validity score** +	**Country** Australia *New South Wales* **Urban/Rural setting** Urban *Intervention hospital* Rural *Control hospital* **Secondary Care Setting** Not Mental Health (Acute and/or Maternity) **Source population** Patients Staff Visitors **Source population demographics** None reported **Recruitment** Not applicable **Population selection criteria** Inclusion criteria not applicable *No recruitment, observation* Exclusion criteria *Children <12 years excluded from counts; observations made during rainy weather excluded from analysis.* % participation agreement	**Method of allocation** Investigator did not assign exposure **Smokefree implementation stage** Smokefree in place *Indoor - state legislation since 1988; partial outdoor – hospital/local policy (in 1991 in H1, already in place in H2)* **When assessed** Before implementation – single time point *2 weeks pre-implementation at H1 (both H1 and H2) in 1991* After implementation – single time point *1 month post-implementation at H1 (both H1 and H2) in 1991* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) Smokefree grounds *Both H1 and H2 retained "smoking areas" within the grounds* **Supporting strategies/ interventions** Implementation committee *H1: Formed by occupational health and safety team with reps from NSW Cancer Council, National Heart Foundation, hospital management, unions, and study's lead author*	**Primary outcomes** Compliance - objective *Number of smokers (anyone who was either lighting, stubbing out, or smoking a cigarette, pipe or cigar) and non-smokers observed in a particular outdoor site; locations of outdoor smokers observed (mapped sites divided into those <10m from hospital entrances and those >10m and <50m from hospital entrances); number of 'staff' (anyone wearing a uniform, or a hospital identification badge, or carrying a stethoscope), 'patient'' (wearing night wear, or a hospital gown, or a patient wrist band), or 'visitor' (those not classified as staff or patient) outdoor smokers or non-smokers. (Reliability: a pilot observation circuit made by both observers simultaneously and independently at H1 was conducted before the study with 98.5% inter-rater agreement.)* **Secondary outcomes** Not applicable **Follow-up periods** Follow-up period(s)	**Primary outcomes** Relevant results – compliance ***A discrepancy is noted in Table 3 of Nagle et al 1996 (p.202) between the raw data and percentages given: the "n/total n" figures do not correspond to the (%) figures for Hospital 1 at Time 1 (32% and 68%, also quoted in the text on p.202 and the abstract). From our calculations, the Chi-square test results do correspond to the "n/total n" figures as printed and we believe the percentages may be incorrect (by our calculations, 18% and 82% for Hospital 1 at Time 1). As the two percentages are the only discrepant figures in the data in Table 3, we have made the assumption that the frequencies data is correct.*** *Number of smokers observed: In the intervention hospital 2 weeks before the implementation of smokefree areas in the grounds (T1), 18% of all outdoor smokers (105/593) used the outdoors sites selected to become smokefree. There was a significant increase to 28% of all outdoor smokers (83/301) observed in those sites 1*	**Limitations identified by author(s)** Identified by author(s) *Observations are only from two hospitals, findings may not be generalizable and the impact of the introduction of smokefree outdoor zones observed in one only. Rainy weather reduced the observation periods at time 2 and a greater proportion of observations was lost from the intervention hospital due to rain. The control and intervention hospital varied at baseline by urban/rural location and size.* **Limitations identified by review team** *See note in the column to the left. The authors report a decrease from 32% to 28% in violations, whereas the raw data suggests a different direction of effect, an increase in violations from 18% to 28%.* **Evidence gaps/future research recommendations**

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	Not applicable **Potential sources of bias** **Setting** *Hospital 1 (intervention): A large urban teaching hospital of 530 beds. Hospital 2 (control): A smaller rural hospital of 156 beds with similar case mix to H1.*	Posters/signage *H1: all signs displayed either the words "No Smoking" or the symbol and all were attached to the outer walls of the building in 22 sites (16%); H2: signs displayed the words "You are now entering a smoke-free environment, please extinguish your cigarette" and were positioned at the entrance of the site accompanied by an ashtray in 11 sites (16%).* Staff letters/payslip notes *H1: Newsletters notified staff* Other *H1: Policy launch incorporated into World No Tobacco Day Activities. Staff notified by bulletin boards and their supervisors.* **Sample size** Control/Comparison sample *Hospital 2: T1 n=2414 observations; T2 n=1943 observations. 67 sites mapped and observed at different time points over 7 days: 3 courtyards, 5 main entrances, 22 secondary entrances, 2 covered exit passageways, 16 verandas, 1 internal and 3 external firestairs, 7 pathways >10m and <50m from any entrance, and 8 lawns/car parks >10m and <50m from entrances.* Intervention sample *Hospital 1: T1 n=4252 observations; T2 n=2787 observations. 135 sites mapped and observed at different time points over 7 days: 8 courtyards, 5 main entrances, 8 secondary entrances, 9 covered exit passageways, 88 verandas, 5 internal and 3 external firestairs, 9 pathways >10m and <50m from any entrance, and 4 lawns/car parks >10m and <50m from entrances* **Baseline comparison** Yes differences btw groups	*6 weeks* **Method of analysis** Method(s) of analysis *Outdoor smoking rate, description of outdoor smokers and location of smokers were calculated as proportions of the total people (or smokers) observed on the grounds. Effectiveness of smokefree signs was calculated as the percentage of all outdoor smokers who were observed smoking in these targeted sites, in both hospitals, before and after the introduction of the signs in H1. Any changes from pre-test to post-test in the intervention hospital (H1) were compared with changes from pre-test to post-test in the control hospital (H2).* **Was Intention To Treat (ITT) analysis conducted? (intervention QA)** Not applicable	*month following the implementation of smokefree outdoor areas signage (T2) (Chi-square=11.71, df=1, p<0.001). In the control hospital, there was no significant change in the proportion of all outdoor smokers who smoked in outdoor sites with smokefree signage at T1 (48%, 62/130) and at T2 (46%, 68/148) (Chi-square=0.09, df=1, p=0.771).* *Locations of outdoor smokers observed: There is limited detail about which outdoor sites at the control hospital (H2) were smoke-free and which were smoking areas, but the authors note that, in the main entrance site "clear geographical boundaries existed and the smoke-free signs were positioned at all entries to the area with the wording 'You are now entering a smoke-free environment, please extinguish your cigarette'. Only 7% of all out-door smokers were observed in the main entrance location" in violation of the signs at T1 and T2. Sites within 10m of entrances and exits of the control and intervention hospitals were more popular with outdoor smokers at both time points (82% (T1), 82% (T2) and 90% (T1), 93% (T2) respectively) than sites more than 10m and less than 50m from entrances in exits of the control and intervention hospitals. These two zones are not further sub-divided in the report, however, into those with smokefree sites and those with smoking areas.*	None reported **Source of funding** Not reported

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		Intervention (H1) and Control hospitals (H2) varied in size and urban/rural location but there was no significant difference in the proportions of observed outdoor smokers classified as staff, patients or visitors at baseline (Chi-square=4.72, df=2, p<0.095). **Study sufficiently powered? (intervention QA)** Not reported		*Number of staff, patient and visitor outdoor smokers: At both the control and intervention hospitals overall, patients (those observed wearing night wear, or a hospital gown, or a patient wrist band) made up 5-16% of all outdoor smokers observed, visitors (those not classified as staff or patients) made up 33-40% of all those observed as smokers outdoors, and staff (anyone observed wearing a uniform, or a hospital identification badge, or carrying a stethoscope) comprised 47-61% of all outdoor smokers observed. There was a significant difference in the proportions of observed outdoor smokers classified as staff at the control hospital (61%) compared with staff at the intervention hospital (47%) (Chi-square=11.81, df=2, p<0.003). These three groups are not further sub-divided, however, into those complying by smoking in the outdoor smoking areas and those violating the policy by smoking in the outdoor sites with smokefree signage.* **Attrition details** Not applicable	
Patten (1995) **Authors** *Patten et al.* **Year** 1995 **Aim of study** *To evaluate the effects of the smokefree policy on the*	**Country** USA *Minnesota* **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health **Source population** Patients	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented 1 Jan '91* **When assessed** Before implementation – single time point *Records data 3 months pre-implementation*	**Primary outcomes** Compliance - objective *Patient behavioural indicators of acting out (frequency of smoking in the hospital room, frequency of additional nursing assistance) (data from patient charts)* Other consequence(s) - subjective *Staff perceptions of whether policy*	**Primary outcomes** Relevant results - compliance *Compliance - objective* *Patient behavioural indicators of acting out: The frequency of smoking in the hospital room increased significantly pre- and post-implementation (from 0 to 18, Chi-square=17.719, df=1, p<0.05) and the*	**Limitations identified by author(s)** Identified by author(s) *Low response rate at follow-up limits the extent to which findings can be generalised. No biochemical validation of psychiatric patients' smoking status.*

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
behavioural functioning of patients and on staff attitudes. Also to examine long term smoking status of patients who were admitted to hospital after implementation of the smokefree policy **Study design** Before-and-after study (with different sample after intervention) *records data (all), staff survey (some outcome measures))* Cross-sectional study *patient post-ban survey, staff survey (some post-ban outcome measures)* **Quality score** + **External validity score** +	Staff **Source population demographics** Health status *PATIENTS Diagnosis: Mood disorders 32% (pre-ban) 35% (post-ban); Adjustment disorders 19% (pre-ban) 19% (post-ban); Psychotic disorders not elsewhere classified 11% (pre-ban) 16% (post-ban); Schizophrenia 11% (pre-ban) 6% (post-ban); Psychoactive substance use disorders 7% (pre-ban) 8% (post-ban); Axis II disorders 4% (pre-ban) 4% (post-ban); Organic mental disorders 4% (pre-ban) 3% (post-ban); Anxiety disorders 4% (pre-ban) 2% (post-ban); Psychoactive substance induced organic mental disorders 2% (pre-ban) 2% (post-ban); Axis III disorders 1% (pre-ban) 1% (post-ban); Organic mental disorders (axis III) 0% (pre-ban) 1% (post-ban); Somatoform disorders 2% (pre-ban) 2% (post-ban); Others 2% (pre-ban) 2% (post-ban)* Speciality care *PATIENTS Treatment duration 12.5 (SD=10.8) days (pre-ban) 11.6 (SD=11.7) days (post-ban): Range 1-53 days (pre-ban) 1-70 days (post-ban)* Smoking status *PATIENTS Smoker 43.3% (pre-ban) 33.3% (post-ban); Mean years of smoking (smokers only) 16.2 (SD=11.0) (pre-ban) 16.9 (SD=12.6) (post-ban) Range 1-55 years (pre-ban) 1-64 years (post-ban); Cigarettes per day (smokers only)*	After implementation – single time point *Records data 3 months post-implementation; Patient survey 16-18 months post-discharge; Staff survey 6 months post-implementation* **Where** Mental Health *Locked inpatient psychiatric unit* **Smokefree coverage** Smokefree building(s) Smokefree grounds Ban exclusions *Patients with off-unit privileges, at an appropriate level, were granted brief passes to leave the building unaccompanied to smoke ("very few patients")* **Supporting strategies/ interventions** Implementation committee Cessation support *Patients' weekly support group led by Nicotine Dependence Center* Pharmacotherapies/NRT *Nicotine gum (patients)* Other *Staff education sessions on the treatment of nicotine dependence; written information for patients* **Sample size** Total sample *PATIENTS (chart data sample) n=184 (pre-ban), n=178 (post-ban)* *Sample characteristics = Source population characteristics. No statistically significant differences in age, sex, treatment duration, psychiatric diagnosis, smoking status, cigarettes smoked per day, or number of years smoking between the pre-ban and post-ban samples.* *PATIENTS (survey sample) n=19 (post-ban)*	*had affected the occurrence of rule infractions (self-reported); Patients' long-term smoking status; Patient use of cessation support during hospitalisation; Patient use of cessation following hospital discharge (all self-reported)* Other consequence(s) - objective *Patient medication use and patient behavioural indicators of acting out (left against medical advice, use of restraints, seclusion, television monitors use) (data from patient charts); number of patient consultations to the Nicotine Dependence Center (records); Recorded patient complaint investigations related to smoking.* **Follow-up periods** Follow-up period(s) *6 months (clinical records data)* Not applicable *staff survey, patient survey* **Method of analysis** Method(s) of analysis *To asses the effects of the policy on patients' behaviours and medication use, data from pre-ban period and post-ban period were compared using Fisher's exact t-test. t-tests and Chi-square tests used, and two-tailed p values of <0.05 were considered evidence of statistical significance.*	*need for additional nursing assistance increased significantly pre- and post-implementation (from 2 to 18, Chi-square=12.543, df=1, p<0.05). The authors note that 17 of the 18 instances of additional nursing assistance "involved the same patient, who was reportedly distressed because she was not able to smoke. The patient was a female smoker who was also responsible for the only recorded patient complaint related to a smoking issue" [p376].* Relevant results - other *Other consequence(s) - objective* *Patient medication use: No significant differences were found in total p.r.n. medication use (Chi-square=1.337, df=1, p=0.249) or in the percentage of patient days with p.r.n. medication (Chi-square=1.937, df=1, p=0.166) before and after the implementation of the policy. [In favour of smokefree]* *Patient behavioural indicators of acting out: Two patients left against medical advice post-implementation and none left pre-implementation however the difference in rates was not significant (Chi-square=1.961, df=1, p=0.500); nor was the rates in use of restraints before and after the implementation of the policy. (Chi-square=2.088, df=1, p=0.175).* *Seclusion rates were significantly lower post-implementation (Chi-square=6.944, df=1, p<0.05) and the rates of television monitors use was significantly lower post implementation (Chi-square=19.113,*	**Limitations identified by review team** *risk self-selection bias, unvalidated outcome measures, no control group* **Evidence gaps/future research recommendations** Evidence gaps *Little known about the long term smoking status of psychiatric patients after hospital admission in a smokefree unit* Future research recommendations *Research to determine which smoking cessation procedures are most effective and acceptable to psychiatric patients.* **Source of funding** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	mean 27.1 (SD=17.8) (pre-ban) 28.7 (SD=28.7) (post-ban) Range 5-100 (pre-ban) 5-170 (post-ban) Age *PATIENTS Mean age 39.3 (SD=16.2) years (pre-ban) 39.3 (SD=18.6) years (post-ban) Range 11-82 years (pre-ban) 14-83 years (post-ban)* Sex *PATIENTS Male 40.8% (pre-ban) 48.3% (post-ban)* **Recruitment** Recruitment method *Patient survey – patients mailed a form asking for permission to call them for a telephone interview. Those returned signed informed consent were telephoned 16-18 months after discharge from hospital. Staff survey – distributed to staff in the units (no further details).* Not applicable *chart data* **Population selection criteria** Inclusion criteria *Chart data for all patients admitted from Oct '90 to Mar '91; Patient survey – all smoker patients admitted to the hospital post-ban (Jan-Mar '91); Staff survey – all staff in the 3 adult psychiatric units at Saint Marys Hospital (1 locked, 2 open units)* Exclusion criteria not reported % participation agreement *Patient survey 38% (post-ban); staff survey 67% (pre-ban) 56% (post-ban)*	*Sample characteristics: 18/19 smokers (95%)* *STAFF (survey sample) n=137 (pre-ban) n=126 (post-ban)* *Sample characteristics - Smoking status: Current smokers 9.5% (pre-) 7% (post-), former smokers 36.5% (pre-) 26% (post-), never smokers 52.0% (pre-) 63% (post-), no response 2.0% (pre-) 4% (post-). Occupation: Responses from staff psychiatrists and psychologists, resident physicians, nurses, nurse clinicians, psychiatric social workers, activity therapists and unit assistants from all 3 units (pre-). 90% (post-) work involved direct contact with patients in the psychiatric units.* *Rev 7: STAFF (survey sample) n=137 (pre-ban) n=126 (post-ban)* *Sample characteristics - Smoking status: Current smokers 9.5% (pre-) 7% (post-), former smokers 36.5% (pre-) 26% (post-), never smokers 52.0% (pre-) 63% (post-), no response 2.0% (pre-) 4% (post-). Occupation: Responses from staff psychiatrists and psychologists, resident physicians, nurses, nurse clinicians, psychiatric social workers, activity therapists and unit assistants from all 3 units (pre-). 90% (post-) work involved direct contact with patients in the psychiatric units.* **Baseline comparison** Not applicable **Study sufficiently powered?** Not reported		*df=1, p<0.05). [In favour of smokefree]* *Patient cessation support: There was no change in the number of consultations to the Nicotine Dependence Center from the pre-implementation to the post-implementation period. N=13 patients attended the Center's weekly support group.* *Recorded patient complaint investigations related to smoking: "The patient was a female smoker who was also responsible for the only recorded patient complaint related to a smoking issue" [p376]* *Other consequence(s) - subjective Occurrence of rule infractions: Post-implementation, staff rated whether the smokefree policy in the adult psychiatric (locked and unlocked) units had affected the 'occurrence of rule infractions'. 58% all staff perceived an increase in rule infractions, 20% perceived no effect, 10% perceived a decrease in rule infractions, and 12% did not respond. (The rules were not specified.)* *Patients' long-term smoking status: At follow-up survey 16-18 months after hospital discharge, 95% (n=18) patients reported that they were current smokers. All patients reported resuming smoking immediately after hospital discharge; n=2 patients reported not smoking at 6 months and at 12 months after discharge.* *Patient use of cessation support*	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	Potential sources of bias *Not applicable for patient data (no recruitment, data taken from records); unlikely for the staff and follow-up patient surveys - self-selecting and no detail of non-responders. Although reports responses from a range of staff occupations across the wards.* **Setting** *A 28-bed locked adult inpatient psychiatric unit in Saint Marys Hospital, Rochester, Minnesota*			*during hospitalisation: At follow-up survey 16-18 months after hospital discharge, 26% (n=5) patients reported that they used nicotine gum during their period of hospitalisation.* *Patient use of cessation following hospital discharge: At follow-up survey 16-18 months after hospital discharge, 21% (n=4) patients participated in any formal smoking cessation intervention 16% (n=3) had used nicotine gum, and none had used nicotine patches.* **Attrition details** Not applicable	
Quinn (2000) **Authors** *Quinn, Inman & Fadow* **Year** 2000 **Aim of study** *Study patient aggression both verbally and physically and compare the number of incidents before and after the implementation of the policy.* **Study design** Before-and-after study (with same sample after intervention) **Quality score** - **External validity score** +	**Country** USA **Urban/Rural setting** Not reported *Guessing Rural.* **Secondary Care Setting** Mental Health **Source population** Patients *average daily census 190 patients in November 1998 and 188 in January 1999. Admissions, 68 during November 1998 and 73 during January 1999. Adults aged 18 to 65 years, representing both acute, newly admitted psychiatrically ill patients, and those who had been hospitalised for longer term illnesses.* **Source population demographics** Health status *representing both acute, newly admitted psychiatrically ill patients, and those who had been hospitalised for longer term*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *Implemented 1st Dec 98* **When assessed** Before implementation – single time point *Nov 98* After implementation – single time point *Jan 99* **Where** Mental Health **Smokefree coverage** Other *"Tobacco could not be used on any part of the hospital campus" (applied to patients, staff and visitors)* **Supporting strategies/ interventions** Written policy(ies) Cessation support *Patient education about smoking and tobacco addiction recovery.* Pharmacotherapies/NRT **Sample size** Total sample	**Primary outcomes** Other consequence(s) - subjective *Rate of verbal acts of aggression per month; rate of physical acts of aggression per month* **Follow-up periods** Follow-up period(s) *One time point January 1999, 1 month after smoke free policy implemented* **Method of analysis** Method(s) of analysis *The results were analysed with t -tests (two tailed) to determine significance.*	**Primary outcomes** Relevant results - other *There were 1,184 verbal acts of aggression during the month of November 1998. There were 656 verbal acts of aggression during January 1999, which corresponded to a 45% decrease. This result was significant (t=3.752, df=376, p<.01).* *There were 266 physical acts of aggression during November 1998. There were 133 physical acts of aggression during January1999, which corresponded to a 50% decrease. This result was significant (t=4.217, df=376, p<.01).* **Attrition details** Not reported	**Limitations identified by author(s)** Identified by review team *Does not take into account demographics of the patients - type of illness. Could education and extra time spend with patients be a reason for less aggression - presuming the staff gave the cessation education (it does not say in the article).* **Limitations identified by review team** **Evidence gaps/future research recommendations** None reported **Source of funding** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	illnesses. Speciality care *98% admitted on involuntary basis - psychiatric illness* Place of residence *Wichita Falls state hospital* **Recruitment** Not applicable *All those in the hospital who smoked recruited - no figures given on this.* **Population selection criteria** Inclusion criteria *Adults aged 18 to 65 years, representing both acute, newly admitted psychiatrically ill patients, and those who had been hospitalised for longer term illnesses.* % participation agreement *Hospital went smoke free so no agreement.* **Potential sources of bias** Not reported *No info on sample* **Setting** *Wichita Falls State Hospital/ state hospital/98% of patients admitted on an involuntary basis.*	*Nov 98: average daily census n=190; admissions n=68* *Jan 99: average daily census n=188; admissions n=73* Sample characteristics: *Smoking status not reported; aged 18- 65 years; both acute and newly admitted psychiatrically ill patients; 98% patients admitted on an involuntary basis.* **Baseline comparison** Not applicable **Study sufficiently powered?** + *Simply a t-test. Confounders not adjusted for.*			
Rauter (1997) **Authors** *Rauter, de Nesnera & Grandfield* **Year** 1997 **Aim of study** *Describe the efforts of a building wide smoking ban in a major public psychiatric*	**Country** USA *New Hampshire* **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health **Source population** Patients Staff **Source population demographics**	**Method of allocation** Not reported Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *All units smokefree January 1st 1991* **When assessed** Before implementation – multiple time points *Two baseline measures: Oct '89-Mar '90 (for 6m, starting 15m pre-) and Oct '90-Dec '90*	**Primary outcomes** Compliance - objective *Possession of unauthorised cigarettes or matches (hospital incident reports)* Other consequence(s) - objective *Overall and smoking-related patient assault rates* *Use of incident reports routinely submitted to the Department of standards and Quality Management formed the basis for evaluating*	**Primary outcomes** Relevant results - compliance *Contraband* *Data from hospital incident reports showed 25 reports of possession of unauthorised cigarettes matches in the 3 months before smokefree was initiated in the psychiatric hospital's buildings (20 of these in the final month). This figure rose to 36 reports of possession in the first 3 months of*	**Limitations identified by author(s)** None identified by author(s) **Limitations identified by review team** **Evidence gaps/future research recommendations** None reported **Source of funding** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
hospital, focusing on assault rates and other indicators prior to and after the implementation of the smoking ban. **Study design** Cohort study **Quality score** + **External validity score** +	None reported **Recruitment** Recruitment method *Incident reports* *Use of incident reports routinely submitted to the Department of standards and Quality Management formed the basis for evaluating assault rates. The reports, completed daily by a unit nurse, mental health worker, or clinician, document any accident or behavioural incident occurring on the unit involving a patient.* *Patient acuity levels* *Daily assessed by nurses. Level 1 requires more intensive nursing contact down to level 5. Assumed that smoking ban would affect these levels.* Not applicable *Data assessed included all current inpatients.* **Population selection criteria** % participation agreement *Reports reviewed so no consent required.* % participation not reported *Reports reviewed so no consent required.* **Potential sources of bias** Not reported *data derived from incident reports, patient acuity level, complaints and population density. All inpatients included, none selected.* **Setting**	*(for 3m pre-imp)* After implementation – multiple time points *2 post-implementation measures: Jan '91-Mar '91 (3m post-) and Jan '92-Jun '92 (for 6m, starting 12m post-). (Acuity measures: Jan '91-Jun '91 (6m post-) only).* **Where** Mental Health **Smokefree coverage** Smokefree building(s) Other: *Designated open-air smoking areas established outside the buildings* **Supporting strategies/ interventions** Cessation support *Sessions from the New Hampshire Lung Association and workshops using hypnosis to quit smoking were offered to employees. 10 % signed up.* *Patients wishing to participate in smoking reduction workshops were urged to do so.* **Sample size** Total sample *Pre-ban period 1: average daily census n=126; average admissions n=67; pre-ban period 2: average daily census n=129; average admissions n=56; post-ban period 1: average daily census n=129; average admissions n=55.* *Sample characteristics: Patients typically admitted on an involuntary basis with an age range from 18-65 years. A small percentage remains hospitalised for ≥6 months.* **Baseline comparison** Not applicable **Study sufficiently powered?** - *No info given on power/analysis*	*assault rates. The reports, completed daily by a unit nurse, mental health worker, or clinician, document any accident or behavioural incident occurring on the unit involving a patient.* *Patient acuity level.* *Daily assessed by nurses. Level 1 requires more intensive nursing contact down to level 5. Assumed that smoking ban would affect these levels.* *Recorded patient complaint investigations related to smoking & perceived rights violations* **Follow-up periods** Follow-up period(s) *Two baseline assessments - baseline 1 9 months prior, baseline 2 3 months prior. Then after smoke free policy implemented - 3 months after ban.* **Method of analysis** Not reported	*smokefree. For the same period 1 year later, 12 incidents of contraband possession were recorded.* Relevant results - other *Overall and smoking-related patient assault rates* *The highest frequency of assaults was during the 6 months of baseline period 1 (15 months prior to the ban), with an average of 49 incidents per month. The first 3 months of the ban showed a decrease in the average monthly assault rate (46.30 incidents) when compared to the same time one year previously (58.67 incidents). One year after ban implementation, an average of 28.5 monthly assault rates occurred in the first 6 months of the year.* *A sub-set of recorded patient assaults were related to smoking. Three smoking-related assaults occurred in the final month of baseline period 2 (3 months prior to the ban) and four smoking-related assaults occurred in the first 3 months of the ban. One year after smokefree implementation, four smoking-related assaults occurred in the first 6 months of the year.* *Patient acuity level* *The average monthly acuity level (from 1, most acute, to 5, ready for discharge) for the pre ban period was significantly lower than the average level for the first nine months of the ban (2.62 and 2.74 respectively, t=2.57, p=0.03).* *Complaint investigations (Recorded*	

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	New Hampshire Hospital. Public inpatient psychiatric hospital, state of New Hampshire consisting of an acute psychiatric service (APS) with a 145 bed capacity, an adolescent program, and a psychiatric nursing home. APS has approx. 850 admissions annually.			*patient complaint investigations related to smoking & perceived rights violations)* *First 6 months of the smoking ban, 15 formal patients complaints about smoking were submitted, majority from recently admitted patients. For the same period the year later, four complaints.* **Attrition details** Not applicable	
Rees (2008) **Authors** *Rees et al* **Year** 2008 **Aim of study** *To examine whether a smoking ban in an inpatient medical detoxification unit would deter patients.* **Study design** Before-and-after study (with different sample after intervention) *Analysis of patient records for patients admitted in the 12 months before the ban, and for patients admitted in the 12 months after the ban.* Document/Content analysis **Quality score** + **External validity score** ++	**Country** USA **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health **Source population** Patients **Source population demographics** Smoking status *smokers and non-smokers* **Recruitment** Not applicable **Population selection criteria** Inclusion criteria not applicable Exclusion criteria not applicable % participation agreement *Not applicable.* **Potential sources of bias (association QA)** ++ **Setting** *The 13-bed First-Step Unit at Louisiana State University Medical centre is a publically funded inpatient substance abuse detoxification unit.*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *April 2001* **When assessed** Before implementation – single time point *12 months pre-ban* After implementation – single time point *12 months post-ban* **Where** Mental Health **Smokefree coverage** Other *Ban on tobacco and discontinuation of patient smoke breaks.* **Supporting strategies/ interventions** Other *Patients informed of smoking ban policy as part of their admission screening process* **Sample size** Total sample *n=516 patients (pre-ban), n=561 patients (post-ban)* Sample characteristics: *Mean age 36.7 years (SEM=0.41) (pre-ban) 35.7 years (SEM=0.41) (post-ban); 69.6% males (pre-) 73.6% males (post-); 72.7% European*	**Primary outcomes** Other consequence(s) - objective *Comparison of number of admissions before and after the ban.* *Comparison of patient demographics before and after the ban.* *Comparison of length of patient stay before and after the ban.* *Comparison of seizure rates among patients before and after the ban.* *Rates of patients leaving the unit against medical advice; transfers to other inpatient facilities.* **Follow-up periods** Not applicable **Method of analysis** Method(s) of analysis *When a patient had multiple admissions in the 24 months examined, one admission was randomly selected for inclusion in the analyses. For continuous variables, means and standard errors of the means were obtained. The averages for the pre-ban period were compared to averages from the post-ban period using T-tests. Analysis of variance was used to compare the effect of the ban*	**Primary outcomes** Relevant results - other *The number of admissions before and after the ban appeared to remain stable, with 516 in the 12 months before, and 561 in the 12 months after the ban.* *Patient demographics also remained similar before and after.* *Mean age: pre-ban 36.7 years; post-ban 35.7 years (difference not significant).* *Gender: pre-ban 69.6% male; post-ban 73.6% male (difference not significant).* *Pre-ban 72.7% European Americans; Post-ban 76.5% European Americans (difference not significant).* *Tobacco users: pre-ban 80.2%; post-ban 84.0% (difference not significant).* *Average length of stay significantly decreased after the ban: pre-ban average stay 5.15 days; post-ban average stay 4.79 days (p<0.05). The decrease was similar for patients who used tobacco and those who, did not (p>0.10).*	**Limitations identified by author(s)** Identified by author(s) *The study was conducted in a detoxification unit, so results may only apply to similar detoxification units rather than long-term substance abuse treatment centres.* *Prior to the smoking ban, there was no assessment of cigarettes smoked per day; anecdotally, however scheduled smoke breaks were well attended.* *There is concern that the lack of publically funded detoxification units may have limited patients' options thus undermining the study's ability to detect the impact of the smoking ban. However, patients did have access to two other publically funded medical detoxification centres, as well as to other hospitals. Consequently patients had some choice in the matter.*

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
		Americans (pre-) 76.5% European Americans (post-). **Baseline comparison** Not applicable **Study sufficiently powered?** Not reported	*on tobacco-users and non-users. For nominal data, proportions were obtained. Proportions from the pre-ban and post-ban periods were compared using Fischer's Exact Tests.*	*There was no evidence of increased rates of patients leaving the unit against medical advice, or transfers to other inpatient facilities among tobacco users (p>0.10).* *Although not statistically significant, seizure rates decreased from 0.58% per year to 0.18% per year.* **Attrition details** Not applicable	*There were no control units to contrast the results with and no random assignment and contrast these results with* **Limitations identified by review team** **Evidence gaps/future research recommendations** None reported **Source of funding** Not reported
Ripley-Moffitt (2010) **Authors** *Ripley-Moffitt et al.* **Year** 2010 **Aim of study** *To examine the influence of a tobacco-free hospital campus (TFHC) policy on employee smoking behaviour.* **Study design** Interrupted time series **Quality score** + **External validity score** +	**Country** USA *North Carolina* **Urban/Rural setting** Not reported **Secondary Care Setting** Not Mental Health (Acute and/or Maternity) **Source population** Staff **Source population demographics** None reported **Recruitment** Recruitment method *Contacted 5534 full-time employees with e-mail addresses from the UNC hospital payroll database. One month before the TFHC policy took effect, these employees received an invitation to participate in an initial two-question survey assessing attitudes toward the new TFHC policy and current smoking prevalence. Non-respondents received follow-up invitations 3 days and 1 week later. Employees who indicated current smoking or*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *Implemented 4th Jul 07* **When assessed** Before implementation – single time point *1 month prior to the smoke free* After implementation – multiple time points *6 months and 1 year after smokefree* **Where** Not Mental Health **Smokefree coverage** Smokefree buildings Smokefree grounds *'100% tobacco-free hospital campus* **Supporting strategies/ interventions** Posters/signage Staff meetings Staff letters/payslip notes *Employee newsletters* Cessation support *Employees offered free smoking cessation services through occupational health* **Sample size** Total sample *Of 5534 employees invited to participate,*	**Primary outcomes** Other consequence(s) - objective *Quit attempts, and influence of policy on behaviour* **Follow-up periods** Follow-up period(s) *6 months and 12 months after policy* **Method of analysis** Method(s) of analysis *Data were imported into SPSS 16.0 and analyzed using descriptive statistics.*	**Primary outcomes** Relevant results - other *At baseline, 31 participants (15%) reported that they had quit smoking in the previous 6 months. Of the 179 participants reporting that they were currently smoking, 45% reported a quit attempt within the previous 6 months. Six months after the policy took effect, 33 participants (15.7%) reported not smoking. These non-smokers included 16 who reported quitting more than 6 months previously, plus 17 who reported quitting during the intervening 6 months. Among the 133 participants who reported currently smoking, 53% reported quit attempts in the intervening 6 months.* *Among the 117 who reported current smoking at the 12-month survey, 48% reported attempts to quit smoking in the preceding 6 months. At each survey, approximately 60% of employees who currently smoked reported plans to quit smoking in the*	**Limitations identified by author(s)** Identified by author(s) *Other factors may have played a role in the employee reports of quit attempts and reports of not smoking. Advertising of the North Carolina tobacco use Quitline (1-800-QUITNOW) ran statewide during this time period.* *Other threats to internal validity could include concern over dropouts from cohort members. However, response rates at each follow-up were around 75%, with 85% of the cohort responding to at least one follow-up survey. Response bias should have been limited by offering incentives to participants, regardless of smoking status.* *A more significant limitation to this research is the lack of a control group. In addition, 16% of full-time employees did not*

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	quitting smoking within the previous 6 months were immediately invited to participate in a study about how the TFHC policy might influence their smoking behaviour. Those accepting the invitation received a link to the baseline questionnaire, and links to follow-up questionnaires 6 months and 1 year later. **Population selection criteria** Inclusion criteria *Full-time employees, excluding physicians, at a hospital system affiliated with a public university medical school.* Exclusion criteria *Excluded physicians* % participation agreement *Of 5534 employees invited to participate, 2024 (37%) responded to the initial two-question survey (67% to first e-mail and 31% to first reminder). The 247 employees (12%) currently smoking and the 60 (3%) who reported that they had quit smoking in the past 6 months were invited to enroll in the follow-up surveys, with 210 (68%) choosing to participate.* **Potential sources of bias** *None selected - all invited and sent the questionnaire however 16% of those employed full time is not have an email address, again no demographics given on these.* **Setting** *University-affiliated hospital system in North Carolina*	*2024 (37%) responded to the initial two-question survey (67% to first e-mail and 31% to first reminder). The 247 employees (12%) currently smoking and the 60 (3%) who reported that they had quit smoking in the past 6 months were invited to enrol in the follow-up surveys, with 210 (68%) choosing to participate.* *Sample characteristics (of smoking cohort): average age 42 years (SD=10); 82% female 73% White (higher percentages than in the full-time employee population as a whole). 90% post-high school education; 97% private insurance (most with the state employee health plan)* *health plan.* **Baseline comparison** Not applicable **Study sufficiently powered?** Not applicable		*next 30 days or the next 6 months.* *The majority of employees reporting either not smoking or making quit attempts reported that the TFHC policy had some influence on their behavior (Figure 2). Over a third (39%) of those not smoking reported a strong influence of the policy at baseline, and 36% indicated a strong influence at 6- and 12-month follow ups. Those who smoked also reported a strong influence of the policy on their quit attempts (20% at baseline, and 24% and 20% at follow-up surveys).* **Attrition details** Number lost to follow-up *Of 5534 employees invited to participate, 2024 (37%) responded to the initial two-question survey (67% to first e-mail and 31% to first reminder). The 247 employees (12%) currently smoking and the 60 (3%) who reported that they had quit smoking in the past 6 months were invited to enroll in the follow-up surveys, with 210 (68%) choosing to participate.*	*have e-mail addresses and were excluded from the study. Among the 2024 employees responding to the initial survey, only 12% indicated current smoking, about 10% lower than the state population prevalence at that time, possibly reflecting selection bias, as other studies have found prevalence of smoking among employees in hospital settings to be closer to population prevalence.2,6 Finally, reports of cessation and quit attempts were not validated, possibly overstating success.* **Limitations identified by review team** **Evidence gaps/future research recommendations** Future research recommendations *More rigorous studies are needed to assess the impact of expanded outdoor smoke-free boundaries on smoking behavior, particularly looking at issues of compliance over time. Additional studies might also look at the relationship between cessation and the provision of tobacco treatment services, determining optimal levels of services needed to assist employees in tobacco cessation.* **Source of funding** Other

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Shetty (2010) **Authors** *Shetty, Alex & Bloye* **Year** 2010 **Aim of study** *This evaluation retrospectively reviewed the outcome in a medium secure hospital of a Trust-wide smoke-free policy by focusing on recorded changes in behaviour, incidents and prescribing* **Study design** Before-and-after study (with same sample after intervention) **Quality score** + **External validity score** ++	**Country** England **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health **Source population** Patients **Source population demographics** Health status *All primary diagnoses of mental illness* Smoking status *89% patients smoked; mean 21 (range 5-50) cigarettes/patient; average daily cigarette consumption in Ward 1 (assessment) n=19 cigs/day, in Ward 2 (continuing care) n=23 cigs/day, in Ward 3 (rehabilitation) n=22 cigs/day.* Age *All adults* Sex *All males* **Recruitment** Not applicable *Reviewed multidisciplinary clinical records, primary healthcare records and incident forms.* **Population selection criteria** Inclusion criteria *All in-patients resident at the time* Exclusion criteria not applicable % participation agreement *Not applicable (chart data)* **Potential sources of bias** Not applicable *records data (no recruitment)* **Setting**	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented Mar '07* **When assessed** Before implementation – single time point *3 months pre-ban* After implementation – multiple time points *3 months post-ban, 12 months post-ban* **Where** Mental Health *Medium secure male unit* **Smokefree coverage** Smokefree building(s) Smokefree grounds Ban exclusions *If the clinical team agreed there was a clinical reason not to enforce abstinence (in practice, none) or for the small number of patients who had unescorted community leave* Other *All in-patients in medium secure units were required to abstain from tobacco (unenforceable for small number with unescorted community leave)* **Supporting strategies/ interventions** Posters/signage Cessation support *In-patients groups and individual sessions* Pharmacotherapies/NRT Closure of smoking rooms Staff training Other *Engagement with patients: individual & group discussions, patient advocates. A physical and procedural security*	**Primary outcomes** Compliance - objective *Illicit use or possession of tobacco (from chart data and hospital records)* Other consequence(s) - objective *Cessation behaviour, use of NRT, incidents of smoking-related verbal and physical aggression, p.r.n. tranquillising medication and clozapine serum levels (all from chart data and hospital records).* **Follow-up periods** Follow-up period(s) *6 months and 15 months* **Method of analysis** Method(s) of analysis *Mann-Whitney U-test for statistical differences between data before and after implementation, and P<0.05 was considered significant. Results were analysed using SPSS v.16.*	**Primary outcomes** Relevant results - compliance *From a review of clinical records and incident forms, n=7 patients had contravened the smokefree policy by way of illicit use or possession of tobacco during the 12 months post-implementation of smokefree. No comparative data were reported for before implementation.* Relevant results - other *Cessation behaviours: 3 months pre-implementation, n=10 patients (20%) attended a smoking cessation course, n=7 (14%) were already contemplating abstinence and n=2 patients gave up smoking.* *Use of NRT: 3 months post-implementation, n=27 (54%) patients used NRT, some requiring treatment for longer than the 3-month period recommended in local guidelines.* *12 months post-implementation, n=10 (20%) patients were receiving NRT, of whom n=4 had received intermittent nicotine replacement for over 12 months.* *Physical aggression: There was a reduction in the number of recorded physical aggression incidents from 3 months before the ban to 3 months after than ban (20 incidents versus 11 incidents); the change in rates of physical aggression was not statistically significant (P = 0.6). 12 months post-implementation, there was no recorded physical aggression*	**Limitations identified by author(s)** None identified by author(s) **Limitations identified by review team** *Used objective measures, same sample for follow-ups, no control group* **Evidence gaps/future research recommendations** Future research recommendations *Evaluation of the long-term impact of a smoke-free policy* **Source of funding** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	NHS 60-bed medium secure unit that admits adult men with primary diagnoses of mental illness. In-patients are distributed between 3 wards (assessment, continuing care and rehabilitation) according to levels of risk.	*infrastructure already adapted to the prevention of illicit substance use.* **Sample size** Total sample *N=56* *Sample characteristics = Source population characteristics* **Baseline comparison** Not applicable **Study sufficiently powered?** Not reported		*directly related to nicotine withdrawal 1 year after implementation.* *Verbal aggression: 3 months pre-implementation, n=3 patients threatened violence to staff or other patients if forced to abstain, however none of the patients who threatened violence were involved in any aggressive incident during the follow-up period.* *There was a reduction in the number of recorded verbal aggression incidents from 3 months before the ban to 3 months after than ban (29 incidents versus 16 incidents); the change in rates of verbal aggression was not statistically significant (P=0.9).* *3 months post-implementation, n=2 patients were involved in verbal outbursts attributed to nicotine withdrawal during the first month after policy implementation. 12 months post-implementation, there was no recorded verbal aggression directly related to nicotine withdrawal 1 year after implementation.* *Use of p.r.n. tranquilliser medication: Comparing the rates of use of tranquillisers for patients 3 months pre-implementation with rates 3 months post-implementation, there was no statistically significant change in rates (P=0.6 for lorazepam and P=0.4 for haloperidol).* *Clozapine serum levels: Twenty-three*	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
				(41%) patients received clozapine (at 3-months post-implementation? (not reported when)), all of whom were smokers; the increase in clozapine levels was significant (P=0.006). It was necessary to reduce the dose in four (17%) patients (again, not reported when). **Attrition details** Not applicable	
Sterling (1994) **Authors** *Sterling et al.* **Year** 1994 **Aim of study** *Was to examine the impact of admissions and attendance of adopting a smoke free policy at a cocaine treatment program offering outpatient group therapy sessions 3 half days a week.* **Study design** Cohort study **Quality score** - **External validity score** +	**Country** USA **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health *Outpatient cocaine treatment program.* **Source population** Patients **Source population demographics** None reported **Recruitment** Recruitment method *They studied the 204 first admission cases.* **Population selection criteria** Inclusion criteria *Those who enrolled in the university sponsored, community based outpatient cocaine treatment program in the three months prior and three months following the September ban. They studied the 204 first admission cases.* **Potential sources of bias** **Setting** *Outpatient cocaine treatment program.*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *Implemented Sep YYYY (year not stated, early 1990s?)* **When assessed** Before implementation – multiple time points *3 months pre-ban (Jun-Aug) breakdown; sub-sample 1 month pre-ban (Aug)* After implementation – multiple time points *3 months post-ban (Sep-Nov) breakdown; sub-sample 1 month post-ban (Sep)* **Where** Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/ interventions** Posters/signage Closure of smoking rooms *Prior to the ban, smoking was restricted to one large room* Other *Informed by therapist* **Sample size** Total sample *n=204* *Sample characteristics: 93.1% African*	**Primary outcomes** Other consequence(s) - subjective *Program attendance: average number of patients attending groups; Patient enrolment: average number of daily new admissions per week in the 3 months prior to and following the ban; proportion of premature terminators from program* **Follow-up periods** Follow-up period(s) *The main analysis breaks it down into a three month before and three month after ban, however other results give a break down of one month before and one month after ban.* **Method of analysis** Method(s) of analysis *Not stated. However T values and levels of significance reported. T-tests?*	**Primary outcomes** Relevant results - other *Outpatient enrolment* *The average number of daily new admissions per week did not decrease significantly following the policy change (t (24)=1.40, p>0.05) and 1.43 (S.D = 0.59) for the 3 months prior to, and the 3 months following the ban, respectively.* *Outpatient Attendance.* *no significant increase in the proportion of premature terminators was observed following the smoking ban (x2 = 2.54, 5d.f, p>0.05).* *Results indicated that the average number of outpatients attending groups per week did not decrease significantly following the ban, with a mean of 21.75 (S.D = 2.18) group attendees before, and 19.75 (S.D = 2.99) following, (t(24) = 1.96, p> 0.05).*	**Limitations identified by author(s)** Identified by author(s) *Made no direct attempt to assess patient or staff distress as a consequence of banning smoking.* **Limitations identified by review team** **Evidence gaps/future research recommendations** None reported **Source of funding** Other

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
		American; 60.3% female; average age at admission 31.6 years (SD=6.4). **Baseline comparison** Not applicable **Study sufficiently powered?** +			
Stillman (1990) **Authors** *Stillman et al.* **Year** 1990 **Aim of study** *Evaluation of a policy ending smoking in a large urban medical centre.* **Study design** Cohort study *Prospective descriptive study* **Quality score** + **External validity score** +	**Country** USA **Urban/Rural setting** Urban **Secondary Care Setting** Not Mental Health (Acute and/or Maternity) **Source population** Staff *Full and part time employees at the hospital and school of medicine.* **Source population demographics** None reported **Recruitment** Recruitment method *All full and part time staff identified and sent via their paycheck an initial survey 2 months before policy announcement. Respondents from this initial survey were then sent the follow up surveys at 6m and 1 y after implementation.* **Population selection criteria** Inclusion criteria *Full and part time permanent employees of the hospital and the school of medicine* **Potential sources of bias** *Self selection bias* *6050/8742 (69.2%) completed initial questionnaire, of these 5190 were usable under the study criteria.* **Setting**	**Method of allocation** Not applicable Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Announced 1st Jan 88, implemented 1st Jul 88.* **When assessed** Before implementation – single time point *Survey Nov 87 (2 months pre-announcement); Ashtray butt counts monthly for 6 months pre-ban; Smoking observations monthly for 8 months pre-ban* Before implementation – multiple time points *Nicotine vapour monitoring 8 months and 1 month pre-ban* After implementation – single time point *Survey Nov-Dec 88 (1 year follow-up, 6 months post-ban); Nicotine vapour monitoring 8 months post-ban; Ashtray butt counts monthly for 6 months post-ban; Smoking observations monthly for 8 months post-ban* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/ interventions** Written policy(ies) Implementation committee *Steering committee of representatives of all major departments was formed to*	**Primary outcomes** Compliance - subjective *Counts of cigarette remnants (in ashtrays, morning and afternoon, at Elevator lobbies, Waiting lounges, Hospital entrances at the parking garages);* *Observations of employee smoking indoors (% staff observed actively smoking (in cafeteria, in lounge); Observations of visitor smoking indoors (% visitors observed actively smoking (in cafeteria, in lounge))* Compliance - objective *Measures of atmospheric nicotine vapour as a proxy for environmental tobacco smoke (ETS); Counts of negligent smoking fires (hospital incident reports)* Other consequence(s) - subjective *Self-report employee current smoking behaviour; self-report employee quit rates* **Follow-up periods** Follow-up period(s) *1 year after the initial survey and 6 months after policy implementation.* **Method of analysis** Method(s) of analysis *Continuous variables were compared from baseline to follow up with Students paired t test for variables*	**Primary outcomes** Relevant results - compliance *The percentage of people observed actively smoking indoors declined dramatically, indicating widespread compliance with the smokefree environment.* *Observations of employee smoking indoors:* *In the 8 months before the smokefree policy was introduced, 2% staff (of 422 staff observed) were recorded actively smoking in two of the hospital cafeterias with a significant decrease to 0% staff (of 330 observed) recorded at 1 and 6 months after the policy was introduced (p<0.0001). A similar observation in four lounge areas of the hospital found a significant decrease in observed staff smoking from 39% (of 23 staff observed) to 0% (of 17 staff observed) before and after the smokefree policy was introduced (p<0.0001).* *Observations of visitor smoking indoors:* *In the 8 months before the smokefree policy was introduced, 13% visitors (of 424 visitors observed) were recorded actively smoking in two of the hospital cafeterias with a significant decrease*	**Limitations identified by author(s)** None identified by author(s) **Limitations identified by review team** **Evidence gaps/future research recommendations** None reported **Source of funding** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	The Johns Hopkins Hospital. Maryland, USA. A large urban medical centre encompassing 24 buildings in a 12-square-block area.	*implement the smokefree environment* Cessation support *Free to all employees: multi component 8-week smoking cessation groups, 1-hour quitting clinics, individualised counselling, and self-help manuals* Staff training *Targeted at all hospital managers, supervisors and security personnel to ensure proper policy enforcement* Other strategies: *Internal media and educational campaign; Free employee screening for cholesterol, blood pressure, CO, cardiovascular risk assessment counselling 6 months before implementation and continued to the present.* **Sample size** Total sample *n=5190 staff pre-implementation (59%); of those still employed post-implementation, n=2877 (64%).* *n=1260 minutes of observations of employee and visitor smoking in the cafeterias and n=1440 minutes in the lounges.* **Baseline comparison** No differences btw groups **Study sufficiently powered?** ++	*demonstrated to be normally distributed by the Wilk-shapiro test for normality. Categorical variables were compared by means of cross tabulation tables and x2 statistics. Nicotine vapour concentrations of 0.24mg/m3 were below the analytical limit of detection. The median point of 0.12mg/m3 was used to calculate medians for areas with levels <0.24mg/m3. Wilcoxon Rank-Sum Test for calculating significance of changes in nicotine vapour concentrations.*	*to 0.3% visitors (equivalent to 1 visitor of 329 observed) recorded at 1 and 6 months after the policy was introduced (p<0.0001). A similar observation in four lounge areas of the hospital found a significant decrease in observed visitors smoking from 41% (of 64 visitors observed) to 0% (of 68 visitors observed) before and after the smokefree policy was introduced (p<0.0001).* *Cigarette butt count from ashtrays: Morning and afternoon counts of cigarette butts from ashtrays at the hospital's elevator lobbies, waiting lounges and hospital entrances at the parking garages were conducted monthly in the 6 months before policy implementation and at 1, 3 and 6 months following implementation. (Note that the ashtrays remained in place after implementation as they were wall-mounted). A significant reduction of 80.7% in counts was recorded in the elevator lobby areas after smokefree implementation (from n=958 to n=184, p<0.01) and a significant decrease of 96.8% was recorded in the waiting lounges after implementation (from n=342 to n=11, p<0.01). There was a non-significant increase of 7.7% in the number of butts recorded in ashtrays at the hospital entrances at the parking garages (from n=90 to n=97); the change was only significant (p<0.05) for the morning count in this location which increased by 88.2% (from n=17*	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
				to n=32). *Counts of negligent smoking fires: During the 4 years preceding implementation of the smokefree policy, there was an average of 20 fire incidents per year in the hospital (range, 12-29 incidents). There were no fire incidents due to negligent smoking within the first year of the smokefree policy.* *Change in indoor ETS levels: Passive diffusion nicotine monitors were used to measure atmospheric nicotine vapour as a proxy for environmental tobacco smoke (ETS) levels in seven indoor locations around the hospital at 1 and 8 months pre-implementation and 8 months post-implementation. In six locations there was a significant decrease in median levels of nicotine concentrations after smokefree was implemented: in visitor/patient waiting areas (from 3.88 to 0.28 mg/m3) and in cafeterias (from 7.06 to 0.22 mg/m3) (both p<0.001); in staff lounges (from 2.43 to 0.12 mg/m3) and in offices (from 2.05 to 0.12 mg/m3) (both p<0.01); in corridors and elevators (from 2.28 to 0.20 mg/m3) and in patient areas (from 0.84 to 0.12 mg/m3) (both p<0.05). The decrease in median concentration of vapour-phase nicotine in restrooms of to 17.71 to 10.00 mg/m3 was not significant, and the levels of ETS were high before and after implementation of smokefree.*	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
				Relevant results - other *During the year between surveys, the reported cross sectional smoking prevalence declined by 25%, from 21.7% to 16.2% (p=0.0001).* *The self reported sustained quitting rate in the respondents in the year between surveys was 20.4% (91/446).* **Attrition details** Number lost to follow-up *Only those who filled in the initial survey and still working for the hospital were followed up at the 6 months and 1 year time point. At 6 months - 5190 who had filled in the questionnaire were still working for the hospital*	
Velasco (1996) **Authors** *Velasco et al.* *[Ryabik, Lippmann & Mount]* **Year** 1996 *A two-year follow-up on the effects of a smoking ban in an inpatient psychiatric service*. 1994 *[An earlier paper reported on the first 2 waves of data collection: Implementation of a smoking ban on a locked psychiatric unit.]* **Aim of study** *The effects of prohibiting*	**Country** USA **Urban/Rural setting** Not reported **Secondary Care Setting** Mental Health **Source population** Patients **Source population demographics** Health status *About 40% have psychosis, 40% affective disorder, 20% chemical dependence or personality or organic mental disorders.* Smoking status *Smokers and non-smokers.* **Recruitment** Not applicable *No recruitment. Observations of those in inpatient facility.* **Population selection criteria**	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *Implemented 1st Oct 91* **When assessed** Before implementation – single time point *6 weeks immediately prior (14th Aug-30th Sep 91)* After implementation – multiple time points *6 weeks immediately after (1st Oct-12th Nov 91) and 6 weeks two years later (1st Oct-3rd Nov 93)* **Where** Mental Health **Smokefree coverage** Other *Prohibited cigarette smoking of inpatients.* **Supporting strategies/ interventions** Posters/signage Pharmacotherapies/NRT	**Primary outcomes** Other consequence(s) - objective *Number of incidents before and after implementation of the ban in 1991 and during the follow up period in 1993.* *Nursing staff prospectively documented the following data: daily census; number of security calls, applications of seclusion and restraint, verbal assaults, and physical assaults per shift; number of administrations of prn medication for anxiety per day; number of patients per day who received nicotine gum or transdermal nicotine; and number of discharges against medical advice per day.* **Follow-up periods** Follow-up period(s) **Method of analysis**	**Primary outcomes** Relevant results - other *Means for the three time periods compared showed significant differences in-* *Number of verbal assaults (F=8.80, df=2,109, p<0.001) during the period immediately after implementation in 1991 was significantly higher than in the period before implementation, but no difference in the number of assaults before implementation and in 1993 follow up.* *Number of applications of soft restraints (F=14.36, df=2,105, p<0.001) were applied significantly more often during the 1993 follow up period than during the period before implementation of the ban.*	**Limitations identified by author(s)** Identified by author(s) *lack of control group and possible cohort effects.* *Some smoking patients were only partially abstinent from tobacco, as they continued to smoke during out of hospital activities. It may be that the study would have found more significant results had the researchers been able to ensure that absolutely no smoking had taken place during the hospitalisation period. Retrospectively it was noted that there were some brief gaps of data collection in the second 6 week period. Because of this, data were aggregated*

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
cigarette smoking on the behaviour of patients on a psychiatric inpatient unit were assessed immediately after implementation of a smoking ban and two years later. **Study design** Cohort study **Quality score** - **External validity score** -	% participation not reported *Participation of all those in inpatient facility.* **Potential sources of bias** Not applicable **Setting** *25 bed, locked inpatient psychiatric service in the university of Louisville Hospital which serves primarily an inner city population.*	Other strategies: *Patient notification prior to admission* **Sample size** Total sample *1991 (immediately prior and immediately post-ban combined): n=193 patients; 1993: n=96 patients* *Sample characteristics: 991 (immediately prior and immediately post-ban combined): 52% female; 70% Caucasian, 28% African American, 2% other. 1993: 53% women; 63% Caucasian, 36% African American, 1% other. Average length of stay approximately 9 days in 1991 and in 1993; and daily patient census and patient diagnosis similar in both years.* **Baseline comparison** Not applicable **Study sufficiently powered?** + *Does not state was significance level is used however 0.06 is outlined as significant in the paper.*	Method(s) of analysis *Means for the three time periods were compared using analysis of variance. Simple F tests were used to compare means for the period before implementation of the smoking ban with means for each of the two periods after the ban.*	*Number of patients who received replacement nicotine (F=8.09, df=2,106, p<0.001) compared with the period before the ban, consumption of replacement nicotine was higher both during the period immediately after implementation of the ban and during the 1993 follow up.* *The use of prn medication for anxiety (f=2.89, df=2,107, p<0.06) was significantly higher during the period immediately after implementation of the ban than during the period before the ban.* *The mean number of physical assaults, security calls and discharges against medical advice did not change significantly between any of the three time periods.* **Attrition details** Not applicable	*into time increments of 7 day units for analysis. This resulted in a 6 week baseline with a 4-week post smoking ban test period.* *Generalisability of the findings may be limited to patients in inner city teaching hospitals.* **Limitations identified by review team** **Evidence gaps/future research recommendations** *Additional research should include studies of a longer duration. As the current study period was only 12 weeks long, it may be that the increase in agitation was due in part to the novelty of the situation. Future patient populations who have become more accustomed to smoke-free environments might be less affected by this change.* **Source of funding** Not reported
Vorspan (2009) **Authors** *Vorspan et al.* **Year** 2009 **Aim of study** *To evaluate smoking exposure in employees from a psychiatric facility, when smoking became forbidden in all closed public places in France*	**Country** France **Urban/Rural setting** Urban *City* **Secondary Care Setting** Mental Health **Source population** Staff *Staff members (nurses, nursing assistants, psychiatrists, residents, administrative assistants)* **Source population demographics**	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented 1 Feb '07* **When assessed** Before implementation – single time point *1 month pre-ban (Jan '07), objective measures only* After implementation – single time point *1 month post-ban (Mar '07), objective and subjective measures*	**Primary outcomes** Compliance - subjective *Self-reported exposure to environmental tobacco smoke (recalled before ban; after the ban; respiratory symptoms (coughing, wheezing) or sensory symptoms (dry eyes, tobacco smells on your clothes) since the ban).* Compliance - objective *Smoking exposure measured by salivary cotinine levels (quantified by high performance liquid*	**Primary outcomes** Relevant results - compliance *Self-reported exposure to environmental tobacco smoke: Surveyed after the ban was implemented, n=40 non-smoking staff (97.5%) perceived that they were exposed to environmental tobacco smoked (ETS) at work before the indoor smoking ban.* *Surveyed after the ban, 76.2% non-smoking staff perceived that they were less exposed to smoking at work*	**Limitations identified by author(s)** None identified by author(s) **Limitations identified by review team** *No control group for temporal trends* **Evidence gaps/future research recommendations** None reported **Source of funding** Not reported

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Study design Before-and-after study (with same sample after intervention) Cross-sectional study **Quality score** + **External validity score** +	Smoking status *All non-smokers* **Recruitment** Recruitment method *Advertising poster in psychiatry dept.; oral consent given; participation was anonymous.* **Population selection criteria** Inclusion criteria *Employees on day duty in the psychiatry dept.; non-smokers only.* Exclusion criteria *Staff working on night duty because patients smoke less at night. Smokers (n=14), assessed by CO smokerlyser ≥10ppm, were excluded from the analysis because of high variability in cotinine levels before and after the ban.* % participation agreement *100%* **Potential sources of bias** *100% participation; 25% (the smokers) excluded from the analysis* **Setting** *Psychiatry department of Fernand Widal hospital, in Paris*	**Where** Mental Health *Psychiatry department* **Smokefree coverage** Smokefree building(s) **Supporting strategies/ interventions** Pharmacotherapies/NRT *For inpatients experiencing withdrawal symptoms (patches 10-40mg/day, inhalators and ad libitum gum); therapies available for staff willing to quit* Closure of smoking rooms *Indoor smoking areas were closed* Other *Patients evaluated for outdoor smoking breaks, ranging from none, limited and accompanied by a nurse, to unlimited.* **Sample size** Total sample *N=42* *Sample characteristics: 76% women; mean age 37 (SD=10) years; location in hospital 62% ground floor, 38% 1st floor; 100% non-smokers, 100% smokerlyser CO measures <5ppm, n=2 lived with smoker.* **Baseline comparison** Not applicable **Study sufficiently powered?** Not reported	*chromatography). Employees were defined as ''exposed'' before the ban if cotinine level >25ng/ml.* **Follow-up periods** Follow-up period(s) *3 months* **Method of analysis** Method(s) of analysis *Paired pre-ban and post-ban decrease in cotinine levels was tested with a one-tailed nonparametric Mann-Whitney U test. Subjective measures are described and compared according to pre-ban exposition with Chi-Square tests. Statistical analyses were performed with SPSS 12.0. One respondent excluded as cotinine result was missing.*	*after smokefree implementation. Sub-group differences: The level of perceived improvement in exposure to smoking at work after the ban was 100% among the "exposed" to ETS staff (who had high cotinine levels before the ban) (n=7) and 70.6% among the "non-exposed" to ETS staff (who had ≤25ng/ml cotinine levels) (n= 34). The difference in perceived improvement between groups was not statistically significant (Chi-Square=3, df=1, p=0.089).* *Sub-group differences: The level of perceived improvement in respiratory and sensory symptoms at work after the ban was 75% among the "exposed" to ETS staff (who had high cotinine levels before the ban) (n=7) and 41% among the "non-exposed" to ETS staff (who had ≤25ng/ml cotinine levels) (n= 34). The difference in perceived improvement between groups was not statistically significant (Chi-Square=2, df=1, p=0. 091). [subjective measures favour (direction of effect) smokefree]* *Smoking exposure measured by salivary cotinine levels: One month before the implementation of an indoor smoking ban, 83% (n=34) of non-smoking staff in the psychiatry department had a median of 0ng/ml cotinine level, thus defined as "non-exposed" to ETS at work (cotinine ≤25ng/ml); 17% (n=7) of the staff had cotinine levels >25ng/ml and were defined as "exposed" to ETS at work*	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
				pre-ban. (Exposed sub-sample characteristics: none lived with a smoker; occupation: nurse-assistant (n = 4), nurse (n = 2), pharmacist (n = 1); mean age 47 years; n=5 women; all worked on the ground floor (44% ground floor staff). *One month after the implementation of an indoor smoking ban, 83% (n=34) of non-smoking staff in the psychiatry department remained "non-exposed" to ETS at work (median of 0ng/ml cotinine level). In the sub-sample of "exposed" non-smokers (n=7), one month after the implementation of an indoor smoking ban there was a significant 8ng/ml decrease in mean cotinine level from 40 (SD=17) ng/ml pre-ban to 32 (SD=8) ng/ml post-ban (one-tailed Mann-Whitney U=1.69, p=0.045) but this sub-sample remained "exposed" (>25ng/ml cotinine).* *The authors hypothesise that, "the garden was already a smoking area before the ban and remained a smoking area after the ban, smoking patients and employees may smoke close enough to the windows, doors and halls of the ground floor facility to expose non-smokers … remaining smoking exposure originating from places other than work … [another] hypothesis is that the ban was broken" [p.531]* **Attrition details** Not applicable	
Wheeler (2007)	**Country** USA	**Method of allocation** Investigator did not assign exposure	**Primary outcomes** Compliance - subjective	**Primary outcomes** Relevant results - compliance	**Limitations identified by author(s)**

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
Authors *Wheeler et al.* **Year** 2007 **Aim of study** *To measure the impact of the new smoke-free campus policies on employees and patients at the two institutions on the hospital campus.* **Study design** Before-and-after study (with different sample after intervention) **Quality score** - **External validity score** +	*Arkansas* **Urban/Rural setting** Not reported **Secondary Care Setting** Not Mental Health (Acute and/or Maternity) **Source population** Patients Staff **Source population demographics** Smoking status *Staff: convenience data collected for 2706/8484 (31.9%) current employees (site 1) by the occupational health office showed a 16.4% rate of smoking on 1st Jul 04 (3 days pre-implementation).* **Recruitment** Recruitment method *Questionnaire site 1 (staff): staff roster from HR Dept. used to randomly sample 1,400 from ~9,000 employees without replacement* Not applicable *For records data (hospital utilisation, employee resignations, terminations, hires)* **Population selection criteria** Inclusion criteria *Questionnaire site 1 (staff): university and hospital and faculty staff* Exclusion criteria not reported *Questionnaire site 1 (staff)* % participation agreement *60.1% (pre-implementation), 65.1% (post-implementation) for Questionnaire site 1* **Potential sources of bias**	Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Site 1: announced 29th Oct 03, implemented 4th Jul 04; Site 2: announced Spring 04, implemented 6 months later (employees) and Spring 05 (12 months later) (employees, visitors, patients)* **When assessed** Before implementation – single time point *Site 1: Apr 04 (questionnaire), Jul 03-Jun 04 monthly mean (hospital utilisation), Jan 04 (employee resignations, terminations, hires); Site 2: 2 months after employee only ban (= 4 months pre-full smokefree) (questionnaire), May 04-Oct 04 monthly mean (hospital utilisation)* After implementation – single time point *Site 1: May 05 (questionnaire), Aug 04-Jul 05 monthly mean (hospital utilisation), Jan 05 (employee resignations, terminations, hires); Site 2: May 05-Oct 05 monthly mean (hospital utilisation)* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) Smokefree vehicles Smokefree grounds Other *All property owned or leased.* **Supporting strategies/ interventions** Written policy(ies) Implementation committee Posters/signage Staff meetings Staff letters/payslip notes Patient appointment letters Cessation support	*Site 1 (staff only): Employee exposure (self-report walking through cigarette smoke on campus)* Other consequence(s) - subjective *Site 1 (staff only): Employee smoking rates (self-report current smoker); [Employee likelihood to leave as a result of the new policy – attitude]* Other consequence(s) - objective *Employee resignations/terminations and new hires; Hospital utilisations (Monthly occupancy rates calculated using licensed bed and staffed bed counts, Meant patient bed days and Mean daily censuses (MDCs)); Cessation support utilisation (site 1 staff only)* **Follow-up periods** Follow-up period(s) *13 months (questionnaire, site 1 only), 12 months (other measures, sites 1 and 2)* **Method of analysis** Method(s) of analysis *Descriptive statistical methods of analyses included proportions and their standard errors. Rao-Scott Chi-square tests for independence (a design-adjusted version of the Pearson Chi-square test) were applied to compare the equality in proportions before and after policy implementation. Fisher's exact test was applied in instances where Chi-square cell expectancy assumptions were not met.*	*Site 1 (staff only): Employee exposure: significantly fewer employees reported that they had to walk through cigarette smoke on campus after the ban than before the ban (18.0% vs. 43.1%, p<0.0001). Results in favour of smokefree.* Relevant results - other *Employee resignations/terminations and new hires: There were no discernible changes in mean employee resignations/terminations after implementation of the campus smoking ban at site 1 or site 2. At site 1, the mean resignations/terminations rate for the 6-month period pre-implementation was 6.14% of all active employees, and 6.05% for the 6-month period post-implementation. There were no discernible changes in rate of new employee hires after implementation of the campus smoking ban at site 1 or site 2. (No further data reported.)* *Hospital utilisations (consumers' use of hospital): Site 1: The 12-month mean licensed bed occupancy changed little pre- and post implementation (57.0% to 58.1%), similarly the 12-month mean staffed bed occupancy changed little pre- and post implementation (87.2% to 87.8%). Over the measured 24 months, the mean monthly occupancy rate using staffed beds and licensed beds was 87.4% and 57.5%, respectively. For both measures, the lowest and highest monthly means occurred in the year*	Identified by author(s) *Study restricted to two hospital campuses and not all outcomes were measured on both campuses. Efforts to enrol other regional hospitals were limited by the hesitancy of institutions to commit to smoke-free and concerns about sharing proprietary information about employment statistics.* **Limitations identified by review team** *Limited reporting as many measures/parts to the study; self-selection bias; no control group* **Evidence gaps/future research recommendations** Evidence gaps *"Reasons that hospitals have not volunteered to go smoke-free have not been carefully studied"* **Source of funding** Government Voluntary/Charity

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
	Mixed: Not applicable for patient/staff records data (no recruitment); Staff survey used HR roster to randomly sample 1,400 from ~9,000 employees without replacement, weighted by gender and age groups for representative estimates of employee population. 60.1% (pre-), 65.1% (post-) participation. No demographics for non-responders. **Setting** *Two sites: 1) Arkansas's university hospital and academic medical center and 2) a smaller, private children's hospital that uses the university's faculty and residents for its medical staff.*	Pharmacotherapies/NRT *Site 1: free to employees for 6m (Apr-Sep 04), on sale on campus to non-employees. Site 2: free to employees (open-ended), n sale on campus to non-employees.* Other *Staff appointed (site 1: wellness director, site 2: tobacco control specialist with cessation expertise); Site 1: portable pagers in emergency dept. for patrons/visitors who needed to leave campus to smoke; Scripts for staff to deal with patrons smoking; Staff violations dealt with by HR dept.; Written policy in new employees packs; Neighbouring businesses notified; Announcements in local media.* **Sample size** Total sample *Questionnaire site 1 (staff): n=842 (pre-implementation), n=912 (post-implementation)* *Sample characteristics: occupation distribution changed significantly due to a change in nurse respondents from 19% (pre-) to 11% (post-) (p<0.0001) and education distribution changed significantly due to decreases in 'high school or less' and 'college graduate' and an increases in 'professional or post-college education' (p=0.015). Gender (p=0.8964), age and race distributions did not change significantly between measures.* *Questionnaire site 2 (staff): n=183* **Baseline comparison** Not applicable **Study sufficiently powered?** Not reported		*before policy implementation. Comparing the 12-month means before and after smokefree implementation, the mean monthly number of patient bed days at site 1 was 7,012, with a low of 6,649 occurring before policy implementation (Nov 03) and a high of 7,409 occurring after implementation (Jul 05).* *The Mean Daily Census for the 12 months pre-implementation was 228.2 and for post-implementation was 232.6. Over the 24 months of the study period, the Mean Daily Census was 230.1, with the lowest census (218.9) and the highest census (244.4) both occurring prior to implementation (in Aug 03 and Feb 04 respectively).* *Site 2: Comparisons of the 6-month averages before and after implementation of the campus-wide smoke-free policy at site 2 show that the licensed bed occupancy rate increased slightly after implementation (from 73.3% to 74.7%) and the staffed bed occupancy rate declined slightly after implementation (from 79.3% to 71.6%). (There was a concurrent increase in the number of staffed beds over this period due to hospital expansion activities.) The mean monthly occupancy rate using staffed beds was 74.4%, with the lowest being 69.4% in May 2005 (post-implementation) and the highest being 82.8% in June 2004 (pre-implementation). The equivalent mean*	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
				monthly occupancy rate for licensed beds was 73.8%, with the lowest being 70.4% in August 2004 (pre-implementation) and the highest being 76.8% in June 2005 (post-implementation). Comparisons of the 6-month averages before and after implementation of the campus-wide smoke-free policy at site 2 show that the mean patient bed days increased slightly after implementation (from 6298 to 6413). During that period, the mean monthly patient days at site 2 were 6,305, with a low of 5,766 in Feb 05 and a high of 6,590 in May 04, both pre-implementation. The overall Mean Daily Census was 206.7, with August 2004 having the lowest Mean Daily Census (197.1, pre-implementation) and June 2005 having the highest Mean Daily Census (215.3, post-implementation). Comparisons of the 6-month averages before and after implementation of the campus-wide smoke-free policy at site 2 show that the Mean Daily Census increased slightly after implementation (from 205.4 to 209.2). *Overall demand for hospital services increased after implementation as indicated by 2% in mean patient bed days and mean daily censuses (in favour of smokefree).* *Cessation support utilisation (site 1 staff only): The cessation services at site 1 reported that 210 staff used one of the several cessation options offered. Quit rates were not reported.*	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
				No further details are reported, including the date of this data. *Employee smoking rates (Site 1 staff only): significantly fewer employees reported they were 'currently a cigarette smoker' after the ban than before the ban (2.6% vs. 9.6%, p<0.0001). (The researchers were "concerned that the rates in the survey were biased by smokers who did not report their behaviors" (p.751) and attempted to validate their results using other self-report surveys with site 1 employees: another survey reported pre-implementation prevalence as 16.4% and a further survey report post-implementation prevalence as 8%). Results in favour of smokefree.* *[Employee likelihood to leave as a result of the new policy: Staff only (site 1 pre- and post-measures, not reported if includes site 2 cross-sectional measures): "more employees stated that they were likely to stay as a result of the policy (more than 30% in both years) or were unaffected by the policy (60% or greater in both years) than those who said they were likely to leave because of the policy (less than 5% in both years)" (p.750). (The researchers were "concerned that underrepresentation of smokers, who may have chosen not to return the survey, might have influenced our results" (p.751) and reweighted the data (more weight to smokers to bring*	

Study details	Population and setting	Method of allocation to intervention/control	Outcomes and methods of analysis	Results	Notes
				the prevalence in Apr 04 and May 05 up to 15% and reduced weights to non-smokers). On reanalysis of the 'likelihood to leave as a result of the new policy' variable, percentages changed proportionally in both years, but only by 2-3% without any effect on significance testing. The results were still in favour of smokefree.)] **Attrition details** Not applicable	

Component 3 "Smokefree Secondary Care Settings"

Review 7
A review of the barriers and facilitators to implementing smokefree strategies and interventions in secondary care settings

To inform the NICE guidance on:
'Smoking cessation in secondary care: acute and maternity services'
'Smoking cessation in secondary care: mental health services'

Draft 3 25th October 2012

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November 2021: NICE guidelines PH45 (June 2013) PH48 (November 2013) have been updated and replaced by NG209. The recommendations labelled [2013] or [2013, amended 2021] in the updated guideline were based on these evidence reviews. See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

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Abbreviations

ASH	Alice Springs Hospital
BAS	before and after study
BHS	broader health care setting
CAMH	Centre for Addiction and Mental Health
CEO	chief executive officer
CI	confidence interval
CPHE	Centre for Public Health Excellence (in NICE)
CS	case study
EPPI-Centre	Evidence for Policy and Practice Information and Co-ordinating Centre
ER4	Eppi-Reviewer version 4.0 software
ETS	environmental tobacco smoke
FMC	Flinders Medical Centre
FT	full text
GP	general practitioner
HCP	health care professional
HR	human resources
HUG	Highland Users' Group
IARC	International Agency for Research on Cancer
IQR	interquartile ranges
ISM	Institute for Social Marketing
HI	high income [country]
MHS	mental health setting
MMS	mixed methods study
NA	not applicable
NCSCT	National Centre for Smoking Cessation and Training
NICE	National Institute for Health and Clinical Excellence
NHS	National Health Service (UK)
NR	not reported
NRT	nicotine replacement therapy
OR	odds ratio
PRN	*pro re nata* – as required (used as a direction in prescriptions)
QS	qualitative study
RAH	Royal Adelaide Hospital
RCSS	repeat cross-sectional study
Rev 6	Review 6
Rev 7	Review 7
SCSS	single cross-sectional study
SD	standard deviation
SHS	second-hand smoke
TQEH	The Queen Elizabeth Hospital
UAMS	University of Arkansas Medical Sciences University Hospital
UK	United Kingdom
UKCTCS	UK Centre for Tobacco Control Studies
US	Unites States (of America)
USA	United States of America
VA hospital	United States Department of Veterans Affairs hospital
WHO	World Health Organization

Executive summary

The National Institute for Health and Clinical Excellence (NICE) commissioned this review to inform two separate pieces of complementary guidance on smoking cessation in secondary care, one relating to acute and maternity services and the other to mental health services. The guidance will address smokefree policies and smoking cessation and make recommendations on approaches to help secondary care commissioners, professionals and managers working in these two areas of healthcare.

The Health Act 2006 was passed on 16th July 2006 and required that all indoor and substantially enclosed outdoor workplaces and public places in England and Wales became smoke-free by 1st July 2007, specifically banning smoking tobacco. In March 2007, residential mental health settings were given a temporary one year exemption from the implementation date, thus were required to become smoke-free by 1st July 2008. There is no legislative requirement for smokefree grounds in England and Wales, although some individual institutions and Trusts have introduced and trialled policies requiring smokefree grounds.

The aim of this review was to systematically review the barriers to and facilitators for implementing smokefree strategies and interventions in secondary care settings (acute, maternity and mental health settings) from service users' and service providers' perspectives. The initial search and screening stages were combined with a parallel review of the effectiveness of smokefree strategies and interventions in secondary care settings conducted by members of the same research team.

This review aimed to address one overarching question; what are the barriers and facilitators affecting adoption of, support for, and compliance with smokefree policies in secondary care settings?; and was guided by three subsidiary questions:

- How does support for smokefree policy differ by population group, service provider and type of policy?
- What factors have an impact on acceptance of smokefree policies?
- What are the adverse events and other consequences associated with smokefree policies?

Sensitive search strategies were developed by an information specialist in conjunction with the research team and peer-reviewed by information specialists at NICE. Searches were run in February 2012 across 22 databases and 26 selected websites. All of the literature searches were conducted for papers published in English from 1990 onwards.

All study data were uploaded and managed using the EPPI-Centre's online review software. Initial inclusion criteria were refined using four rounds of pilot screening to identify 229 papers for full-text screening from more than 17,000 title and abstract records. Papers were then re-screened in full for relevance and applicability and 53 studies (54 papers) identified for data extraction. Data were extracted and assessed for quality using recommended NICE templates and critical appraisal checklists. At all stages of the screening process two or more members of the researcher team conducted assessments and a third member adjudicated on any unresolved disagreements.

Forty-eight of the included studies were published in academic or practitioner journals, four were published as reports and one was an unpublished report. Nineteen studies used qualitative designs, 29 used quantitative designs and five used a mixed methods approach. The majority (n=20) of the included studies were conducted in the UK: 16 in England, two in Scotland and one in Wales. All of

the included studies were conducted in a high-income country to ensure relevance to UK secondary care settings.

Thirty-one of the 53 included studies were conducted exclusively in mental health settings, all but one of which (n=24) was published in the last decade. The other twenty-two studies were conducted in broader secondary care settings likely to include acute and maternity services. In some cases these studies may also include the views of service users and providers working in mental health services. The overall quality of the included studies was judged to be moderate.

The review provided a large body of qualitative and quantitative data relating to factors affecting the adoption of, support for and compliance with smokefree policies and interventions in secondary care settings. This enabled the team to conduct a narrative synthesis of related evidence incorporating both staff and patient perspectives, leading to the construction of 52 separate evidence statements. Forty-seven of the statements were judged to provide conclusive views-based evidence of barriers and facilitators to implementation of smokefree policy, and included conclusive evidence of seven perceived adverse consequences. The evidence statements are generally judged to have high applicability with the majority (36 out of 52) derived from data drawn predominantly from UK studies.

The evidence statements addressing each review question are as follows:

1. How does support for smokefree policy differ by population group, service provider and type of policy?

1.1 **Facilitator: exposure to the policy brings about a positive shift in levels of staff support.** Eight studies (one UK, seven non-UK), five relating to mental health and three to broader secondary care settings found that staff support for smokefree policy increased post-implementation (**Cormac 2010 [England, MHS, BAS+]; Erwin 1991 [USA, MHS, BAS-]; Haller 1996 [USA, MHS, BAS+]; Matthews 2005 [USA, MHS, BAS-]; Sheffer 2009 [USA, BHS, BAS+]; Voci 2010 [Canada, MHS, RCSS++]**; **Wheeler 2007 [USA, BHS, MMS-]; Hudzinski 1990 [USA, BHS, BAS+]**). One study conducted in a US mental health setting found that staff support declined post-implementation (**Steiner 1991 [USA, MHS, BAS+]**).

1.2 **Barrier: differences in level of support by smoking status and occupational group.** Nine studies (three UK, six non-UK), four conducted in mental health settings and five in broader secondary care settings, found that staff who smoked were less likely than staff who were non-smokers to support smokefree policy (**Bloor 2006 [England, MHS, SCSS+]**; **Daughton 1992 [USA, BHS, RCSS-]; Donchin 2004 [Israel, BHS, BAS+]; Garg 2009 [England, MHS, SCSS+]; Kannegaard 2005 [Denmark, BHS, RCSS++]; Parks 2009 [England, BHS, SCSS+]; Steiner 2009 [USA, MHS, SCSS+]; Vardavas 2009 [Greece, BHS, SCSS-]; Voci 2010 [Canada, MHS, RCSS++]**). Five studies (three UK, two non-UK), two conducted in mental health settings and three in broader secondary care settings found that nurses were less likely to support smokefree policy than other healthcare workers (**Garg 2009 [England, MHS, SCSS+]; Lewis 2011 [Wales, BHS, SCSS+]; Vardavas 2009 [Greece, BHS, SCSS-]; Voci 2010 [Canada, MHS, RCSS++]**; **Ratschen 2008 [England, BHS, MHS, MMS+])**.

1.3 **Inconclusive: exposure to the policy brings about a positive shift in levels of patient support.** One UK study conducted in a mental health setting found that patient support for

smokefree policy increased post-implementation (**Cormac 2010 [England, MHS, BAS+]**), while another study conducted in a broad secondary setting in the USA found that patient support had increased in the short-term (i.e. at 6 months post implementation) but then decreased in the longer-term (i.e. by 12 months support had fallen below pre-implementation levels) (**Hudzinski 1990 [USA, BHS, BAS+]**).

1.4 **Barrier: differences in level of support by patient smoking status.** One US study conducted in a broad secondary care setting found that patients who smoked were significantly less likely than patients who were non-smokers to support a smokefree policy (**Rosen 1995 [USA, BHS, SCSS+])**.

1.5 **Facilitator: greater support for smoking bans where designated smoking areas are provided.** One Australian study found a strong preference amongst staff for a partial outdoor ban incorporating designated smoking areas on hospital grounds (**Jones 2010 [Australia, BHS, SCSS+]**) while two studies (one UK, one non-UK), one conducted with staff and the other with patients found a strong preference for a smokefree indoor policy incorporating designated indoor smoking areas to a total ban on smoking indoors (**Vardavas 2009 [Greece, BHS, SCSS-]; Smith 2008 [England, MHS, SCSS+]**). One UK study conducted in a broad secondary care setting found a marginal preference amongst staff for a total ban on hospital grounds to a partial outdoor ban (**Lewis 2011 [Wales, BHS, SCSS+])**. Of the three studies (two UK, one non-UK) supporting the provision of designated smoking areas, one was conducted in a mental health setting (**Smith 2008 [England, MHS, SCSS+]**) and two were conducted in broader secondary care settings (**Jones 2010 [Australia, BHS, SCSS+]**; **Lewis 2011 [Wales, BHS, SCSS+]**).

1.6 **Barrier: differences in level of support for a total ban on smoking by smoking status and occupational group.** One UK study conducted in a mental health setting found staff who were smokers to be less likely to support a total ban on smoking than staff who were non-smokers, and healthcare and clinical staff to be less likely to support a total ban than managers **(Praveen 2009 [England, MHS, SCSS+]**).

2. What factors have an impact on acceptance of smokefree policies?

2.1 **Barrier: negative association between perceptions of smoking as a right and readiness to support smokefree policy by staff and patients.** Eight studies (six UK, two non-UK), seven of which were conducted in mental health settings and one in a broader secondary care setting, and six of which were conducted with staff and two with patients, found a negative association between readiness to support smokefree policy and perceptions of smoking as a right (**Johnson 2010 [Canada, MHS, QS++]; Arack 2009 [England, BHS, SCSS-]**; **Kotz 1993 [USA, MHS, CS-]**; **McNeill 2007 [Scotland, MHS, QS+]**; **HUG 2007 [Scotland, MHS, QS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2010 [England, MHS, QS++]**).

2.2 **Barrier: differences in belief by smoking status that smokers' have a right to smoke.** Two UK studies, both conducted in mental health settings, found that staff who smoke are more likely to believe in the 'right to smoke' and are less likely to support the right of non-smokers to be protected from second-hand smoke compared to non-smokers [**Bloor 2006 [England, MHS, SCSS+]**; **Ratschen 2009b [UK, MHS, SCSS++]**).

2.3 **Barrier: negative association between staff perceptions of smoking as a right and providing cessation support.** Two non-UK studies both conducted in mental health settings, found a negative association between perceptions of smoking as a right and staff readiness to provide cessation support to patients (**Drach 2012 [USA, MHS, QS-]; Johnson 2010 [Canada, MHS, QS++]**).

2.4 **Facilitator: positive association between staff recognition of smoking as an addiction and readiness to provide cessation support.** Four studies (three UK, one non-UK), three conducted in mental health settings and one in a broader secondary care setting, reported a belief that staff are more likely to support the provision of cessation treatments when smoking is framed as an addiction or is acknowledged as having an impact on patient physical health worthy of treatment (**McNeill 2007 [Scotland, MHS, QS+]**; **Wareing 2012 [England, MHS, QS+]**; **Ratschen 2009a [England, MHS, QS++]**; **Schultz 2011 [Canada, BHS, QS++]**].

2.5 **Facilitator: timing implementation to take advantage of prevailing weather conditions.** Two UK studies, both conducted in mental health settings, reported that giving consideration to seasonal weather conditions at the time of implementation may have an impact on smokers willingness to smoke outdoors (**McNeill 2007 [Scotland, MHS, QS+]**; **HUG 2007 [Scotland, MHS, QS-]**).

2.6 **Inconclusive: introducing smokefree policy in one or more steps.** Two UK studies, both conducted in mental health settings, considered the effectiveness of phasing the introduction of smokefree policy against implementing policy in one single step. There was no consensus on the more effective approach. (**McNeill 2007 [Scotland, MHS, QS+]**; **Mental Health Foundation 2009 [England, MHS, SCSS+]**).

2.7 **Barrier: settings where smoking has not previously been contested.** Three studies (one UK, two non-UK), all conducted in mental health settings, attribute difficulties in implementing and acceptance of smokefree policy to policies of this kind being new and smoking not having previously been contested (**Seymour 2000 [England, BHS, CS-]; Karan 1993 [USA, MHS, CS-]**; **Jessup 2007 [USA, MHS, QS++]).**

2.8 **Facilitator: context where smokefree norms are already widely established.** Five studies (two UK, three non-UK), two conducted in mental health settings and three in broader health care settings, suggest that acceptance of smokefree policy is greater where smokefree norms are already established in adjacent communities and where implementation forms part of a broader initiative (**Fitzpatrick 2009 [Ireland, BHS, MMS+]**; **Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]; Sheffer 2009 [USA, BHS, BAS+]**; **Drach 2012 [USA, MHS, QS-]**).

2.9 **Facilitator: strong leadership.** Five studies (three UK, two non-UK), four conducted in mental health settings and one in a broader secondary care setting, made specific reference to the importance of strong leadership in supporting implementation of smokefree policy, and this was found to be particularly important to securing resources, preparing the service for change and persuading sceptics and detractors**.** (**McNeill 2007 [Scotland, MHS, QS+]**; **Jessup 2007 [USA, MHS, QS++]**; **Karan 1993 [USA, MHS, CS-]; Wareing 2012 [England, MHS, QS+]; Seymour 2000 [England, BHS, CS-]**].

2.10 **Facilitator: clear planning process.** Four studies (three UK, one non-UK), all conducted in mental health settings, highlight the importance of having a clear planning process and sufficient time for policy development, stakeholder consultation, consensus building and preparing the service for change. (**McNeill 2007 [Scotland, MHS, QS+]**; **Jessup 2007 [USA, MHS, QS++]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**]. Three studies (two UK, one non-UK), two conducted in a mental health settings and one in a broader secondary care setting, suggest that having in place comprehensive mechanisms for consulting with staff and patients, and informing them of rule changes are also important (**Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]; Ratschen 2008 [England, BHS, MHS, MMS+])**.

2.11 **Barrier: lack of staff consultation.** One UK study conducted in a broad secondary care setting illustrates how lack of staff consultation and a failure to listen to staff can hamper implementation [**Seymour 2000 [England, BHS, CS-]**].

2.12 **Facilitator: culture of critical evaluation.** One Australian study conducted in a mental health setting highlights the value of developing a culture of critical evaluation, where staff can review and modify practice in accordance with lessons acquired from implementing policy (**Campion 2008 [Australia, MHS, QS+]**).

2.13 **Barrier: poor management commitment.** Two UK studies conducted in mental health settings illustrate how a lack of management commitment to actively addressing problems with implementation can act as an organisational barrier (**McNeill 2007 [Scotland, MHS, QS+]; Wareing 2012 [England, MHS, QS+]**].

2.14 **Facilitator: easier to enforce in secure mental health facilities compared to open facilities.** Two UK studies reported enforcement of smokefree rules to be easier in secure mental health facilities compared with open facilities, which was attributed to smaller numbers of patients and greater control over patient movement in secure settings [**Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**]. However, despite being more straightforward to enforce in secure settings, three UK studies reported that policing in these settings required additional resources (**McNeill 2007 [Scotland, MHS, QS+]; Ratschen 2009a [England, MHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+]**).

2.15 **Barrier: willingness to accept responsibility for enforcement.** Four studies (three UK, one non-UK), three conducted in mental health settings and one in a broader secondary care setting, found a reluctance amongst healthcare staff to assume responsibility for escorting patients and enforcing smokefree policy (**McNeill 2007 [Scotland, MHS, QS+]**; **Kotz 1993**

[USA, MHS, CS-]; Shipley 2008 [England, BHS, SCSS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]).

2.16 **Barrier: perceived ability to enforce smokefree policy.** Four studies (three UK, one non-UK), one conducted in a mental health setting and the three in broader secondary care settings, reported that staff felt they lacked confidence in their ability to enforce the policy and in particular to deal with patients who challenged their authority (**Schultz 2011 [Canada, BHS, QS++]**; **Arack 2009 [England, BHS, SCSS-]**; **Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+])**.

2.17 **Barrier: inadequate guidance and training on dealing with violations.** Six studies (four UK, two non-UK), five conducted in mental health settings and one in a broader secondary care setting, reported instances where staff expressed a need for better guidance and training on how to deal with violations and to de-escalate smoking-related situations (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]; Campion 2008 [Australia, MHS, QS+]; Ratschen 2009a [England, MHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+]**).

2.18 **Barrier: lack of clarity and inconsistency in application of rules.** Eight studies (five UK, three non-UK), seven conducted in mental health settings and one in a broader secondary care setting, found that lack of clarity on policy and inconsistencies in the way in which smokefree rules are applied can adversely affect compliance and the wider therapeutic environment (**Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Wareing 2012 [England, MHS, QS+]**; **Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+]; Parle 2004 [Canada, MHS, CS-]; Campion 2008 [Australia, MHS, QS+]; Karan 1993 [USA, MHS, CS-])**.

2.19 **Facilitator: a belief that designated smoking areas are necessary to support compliance.** Four studies (two UK, two non-UK), one conducted in a mental health setting and three in broader secondary care settings, suggest staff support for smokefree policy is predicated on a belief that designated areas are necessary to support compliance (**Schultz 2011 [Canada, BHS, QS++]; Wheeler 2007 [USA, BHS, MMS-]; Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+])**. Two UK studies, both conducted in mental health settings, reported unofficial smoking areas becoming established on hospital grounds in the absence of designated smoking areas [**Ratschen 2009a [England, MHS, QS++]; Ratschen 2010 [England, MHS, QS++]**).

2.20 **Barrier: association between poorly designed smoking areas and poor compliance.** Two UK studies, both conducted in mental health settings, suggest that poor compliance is associated with poorly equipped and positioned smoking areas (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]**].

2.21 **Facilitator: association between well-designed smoking areas and good compliance.** Two UK studies, one conducted in a mental health setting and another in a broader secondary care setting, reported a positive association between compliance and well equipped and positioned outdoor smoking areas **Arack 2009 [England, BHS, SCSS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]**].

2.22 **Barrier: insufficient staff resources to police smokefree policy on hospital grounds.** Seven studies (six UK, one non-UK), six conducted in mental health settings and one in a broader

secondary care setting, reported a lack of staff resources to escort patients and patrol hospital grounds as a reason for poor compliance (**McNeill 2007 [Scotland, MHS, QS+]; Karan 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2009a [England, MHS, QS++]**; **Arack 2009 [England, BHS, SCSS-]; Wareing 2012 [England, MHS, QS+]**].

2.23 **Barrier: structural limitations adversely affect compliance and enforcement.** Three UK studies, all conducted in mental health settings, identified poor access to outside areas and large, shared grounds as factors responsible for poor compliance and difficulties in policing (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Wareing 2012 [England, MHS, QS+]**].

2.24 **Barrier: emergence of underground markets creates additional challenges for enforcement.** Three studies (one UK, two non-UK), all conducted in mental health settings, report the emergence of an underground market for tobacco products following implementation, with visitors and relatives posing a particular problem in supplying contraband tobacco (**Karan 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]**).

2.25 **Facilitator: implementing search policies more straightforward in secure settings.** One UK study conducted in a secure forensic mental health facility reported that reclassifying tobacco as a contraband item had facilitated routine searches of visitors, patients and staff members entering the premises (**Pritchard 2008 [England, MHS, QS++]**).

2.26 **Facilitator: belief that take-up of cessation support can be influenced by the way in which advice is framed.** Three studies (two UK, one non-UK), all conducted in metal health settings, suggest that patients are more likely to engage with cessation services when advice is delivered in a non-coercive manner and is motived by a desire to improve patient health, and not merely to support the smokefree policy (**HUG 2007 [Scotland, MHS, QS-]**; **Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Jessup 2007 [USA, MHS, QS++])**.

2.27 **Barrier: belief that take-up of cessation support is dependent upon patient readiness to quit.** One UK study conducted in relation to mental health settings reported that smokefree facilities can act as a trigger to consider quitting but also found patient willingness to engage with cessation support is dependent upon their readiness to stop (**HUG 2007 [Scotland, MHS, QS-]**). Two UK studies, both conducted in mental health settings, found some patients were motivated to take up support for temporary abstinence and to reduce consumption rather than to quit [**Ratschen 2010 [England, MHS, QS++]; Wareing 2012 [England, MHS, QS+]**].

2.28 **Barrier: poor continuity with cessation support in the community.** Four studies (three UK, one non-UK), three conducted in mental health settings and one in a broader secondary care setting, found that poor communication and continuity of support with cessation services in the community made providing cessation support for inpatients as part of a smokefree policy harder to plan and implement [**Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Schultz 2011 [Canada, BHS, QS++]; McNeill 2007 [Scotland, MHS, QS+]**; **Wareing 2012 [England, MHS, QS+]**].

2.29 **Facilitator: provision of cessation support for staff.** Two studies (one UK, one non-UK), both conducted in mental health settings, suggest that providing cessation support to staff as well

as patients is important to successful implementation of smokefree policy (**McNeill 2007 [Scotland, MHS, QS+]**; **Jessup 2007 [USA, MHS, QS++])**. Two other studies (one UK, one non-UK), both conducted in broader secondary care settings, found that take-up of such services by staff to be low (**Tillgren 1998 [Sweden, BHS, QS-]; Ratschen 2008 [England, BHS, MHS, MMS+]**).

2.30 **Barrier: gaps in provision of cessation resources.** Seven studies (six UK, one non-UK), five conducted in mental health settings and two in broader secondary care settings, reported gaps and inequities in the provision of important cessation resources and support as part of a smokefree policy relating to four mains areas; information materials, pharmacotherapies, trained staff and diversionary activities (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2010 [England, MHS, QS++]**; **Wareing 2012 [England, MHS, QS+]**; **Schultz 2011 [Canada, BHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+])**.

2.31 **Barrier: belief that some mental health patients require special consideration and support.** Eleven studies (seven UK, four non-UK) identified specific types of mental health patient as requiring special consideration and potential exemption status from smokefree policy: long-stay psychiatric patients receiving continuing care who may regard the mental health facility as their home (**McNeill 2007 [Scotland, MHS, QS+]**; **HUG 2007 [Scotland, MHS, QS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2010 [England, MHS, QS++]**]; cognitively impaired and acutely ill psychiatric patients who have limited capacity to understand and to retain the information surrounding the policy and who can be disruptive and present an increase risk to staff (**McNeill 2007 [Scotland, MHS, QS+]**; **Campion 2008 [Australia, MHS, QS+]**; **Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2008 [England, BHS, MHS, MMS+]**; **Karan 1993 [USA, MHS, CS-]);** and patients being treated for other addictive disorders who may find stopping smoking whilst simultaneously giving up other substances interferes with their treatment and recovery (**Jessup 2007 [USA, MHS, QS++]**; **Karan 1993 [USA, MHS, CS-]**; **Kotz 1993 [USA, MHS, CS-]; Hill 2007 [England, MHS, SCSS++]**).

3. What are the adverse events and other consequences associated with smokefree policies?

3.1 **Barrier: belief that smokefree policy would adversely affect psychiatric patients' mental health.** Two studies (one UK, one non-UK) found that staff expected smokefree policy to have a negative impact on patient mental health (**Praveen 2009 [England, MHS, SCSS+]**; **Wye 2010 [Australia, MHS, SCSS++]**) while two other Canadian studies found that withdrawal of tobacco was believed to risk exacerbating the symptoms of mental illness (**Johnson 2010 [Canada, MHS, QS++]; Parle 2004 [Canada, MHS, CS-]**). Four studies (one UK, three non-UK) found that beliefs about these adverse effects had diminished following implementation of the policy or that the effects were not believed to be as significant as had been anticipated (**Cormac 2010 [England, MHS, BAS+]; Haller 1996 [USA, MHS, BAS+]; Voci 2010 [Canada, MHS, RCSS++]; Steiner 1991 [USA, MHS, BAS+]**).

3.2 **Inconclusive: belief that smokefree policy would be beneficial to psychiatric patients' physical health.** Two studies (one UK, one non-UK) found that mental health staff believed smokefree policy would benefit patients physical health (**Praveen 2009 [England, MHS, SCSS+]**; **Wye 2010 [Australia, MHS, SCSS++]**), while one UK study reported that psychiatric patients believed it would adversely affect patient physical health, a belief that remained unchanged after implementation (**Cormac 2010 [England, MHS, BAS+]**).

3.3 **Barrier: belief that enforcement of smokefree policy would result in abuse and aggression.** Seven studies (five UK, two non-UK), four conducted in mental health settings and three in broader secondary care settings, reported concerns that enforcing smokefree policy is a potential source of conflict, and could result in abuse and increased risk of assault (**Arack 2009 [England, BHS, SCSS-]**; **Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]; Campion 2008 [Australia, MHS, QS+]; HUG 2007 [Scotland, MHS, QS-]; Wye 2010 [Australia, MHS, SCSS++]; Shipley 2008 [England, BHS, SCSS+]**). Two UK studies, one conducted in a mental health setting and the other in a broader secondary care setting, reported cases where staff specifically reported not enforcing the policy for fear of conflict (**Ratschen 2009a [England, MHS, QS++]**; **Shipley 2008 [England, BHS, SCSS+]**).

3.4 **Barrier: cases of abuse and aggression can be a feature of implementation but often not at the frequency or severity anticipated.** Five qualitative studies (two UK, three non-UK), four conducted in a mental health setting and one in a broader secondary care setting, reported that fear of abuse and aggression were not realised following the introduction of a smokefree policy (**Wheeler 2007 [USA, BHS, MMS-]; Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]**; **Cooke 1991 [Canada, MHS, CS-]; Parle 2004 [Canada, MHS, CS-]**). Three UK studies conducted in mental health settings reported an increase in incidents related to the introduction of the smokefree policy (**Mental Health Foundation 2009 [England, MHS, SCSS+]; Ratschen 2009a [England, MHS, QS++]; Pritchard 2008 [England, MHS, QS++]**]. However, one of these studies indicated that these changes were restricted to lower level effects such as verbal abuse (**Pritchard 2008 [England, MHS, QS++]**). Similarly, of the two quantitative studies that assessed changes over time for this issue, both of which were conducted in mental health settings, one UK study reported significantly lower numbers of staff expressing concerns after implementation compared to before implementation of the policy (**Cormac 2010 [England, MHS, BAS+]**). The other quantitative study (non-UK) found that while there was agreement that verbal assaults and aggression had increased after implementation there was general disagreement that other more serious incidents such as physical assaults had increased (**Voci 2010 [Canada, MHS, RCSS++]**).

3.5 **Barrier: belief that smokefree policies were damaging to the patient-carer relationship and the therapeutic environment.** Eight studies (five UK, three non-UK), seven of which were conducted in mental health settings and one in a broader secondary care setting, reported a belief amongst healthcare staff that policing and enforcing smokefree policy was detrimental to establishing therapeutic relationships with patients (**McNeill 2007 [Scotland, MHS, QS+]; Campion 2008 [Australia, MHS, QS+]; Karan 1993 [USA, MHS, CS-]; Kotz 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008**

[England, MHS, QS++]; Ratschen 2009a [England, MHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+]). One UK study conducted in a mental health setting found that staff who smoked were more likely to believe that there were therapeutic benefits to staff smoking with patients than staff who were non-smokers (**Praveen 2009 [England, MHS, SCSS+]**). Three studies (two UK, one non-UK), all conducted in mental health settings, found that smokefree policies could be detrimental to establishing a positive therapeutic environment (**Ratschen 2009a [England, MHS, QS++]**; **Wareing 2012 [England, MHS, QS+]; Kotz 1993 [USA, MHS, CS-])**.

3.6 **Facilitator: belief that smokefree policies can make positive contributions to the patient-carer relationships and therapeutic environment.** One UK mental health study reported that escorting patients to outside areas to smoke can provide new opportunities to interact with patients [**Pritchard 2008 [England, MHS, QS++]**], while another UK study conducted in broader secondary care settings reported that new recreational spaces created from former smoking rooms can have a positive impact on patient behaviour and sense of well-being (**Ratschen 2008 [England, BHS, MHS, MMS+]**).

3.7 **Inconclusive: belief that smokefree policy leads to longer staff breaks and tension between smoking and non-smoking staff.** Three UK studies, one conducted in a mental health setting and two in broader secondary care settings, suggest that smokefree policy leads to staff who are smokers taking more break time (**Arack 2009 [England, BHS, SCSS-]**; **Ratschen 2008 [England, BHS, MHS, MMS+]; Wareing 2012 [England, MHS, QS+]**). Two of these studies also report that these changes can lead to tension between smoking and non-smoking staff (**Arack 2009 [England, BHS, SCSS-]; Wareing 2012 [England, MHS, QS+]**)**.** Two non-UK studies, both conducted in broad secondary care settings, report that smokefree policy may lead to greater equity in break patterns (**Schultz 2011 [Canada, BHS, QS++]; Sheffer 2009 [USA, BHS, BAS+]**).

3.8 **Barrier: belief that changing break patterns places extra demands on staff resources and disrupts healthcare delivery.** Two studies (one UK, one non-UK), one conducted in a mental health setting and the other in a broader secondary care setting, report that the need to supervise patients smoking, places extra demands on staff time and resources and disrupts patient attendance for treatment and participation in therapeutic activity (**Schultz 2011 [Canada, BHS, QS++]; Wareing 2012 [England, MHS, QS+]**).

3.9 **Barrier: lack of understanding about the interaction between stopping smoking and antipsychotic medication**. Three UK studies, two conducted in mental health settings and one in broader secondary care settings, reported a lack of understanding by staff about the interaction between stopping smoking and dose requirements for antipsychotic medications (**McNeill 2007 [Scotland, MHS, QS+]**; **Ratschen 2009a [England, MHS, QS++]**; **Ratschen 2008 [England, BHS, MHS, MMS+])**.

3.10 **Barrier: belief that smokefree policy has an adverse impact on the amount of medication required by patients.** Two studies (one UK, one non-UK), both conducted in mental health settings, reported that implementation of smokefree policy would result in an increase in the amount of medication required by mental health patients (**Cormac 2010 [England, MHS,**

BAS+]; **Haller 1996 [USA, MHS, BAS+]**), while another study (non-UK), also conducted in a mental health setting, reported general disagreement that smokefree policy would reduce medication use (**Wye 2010 [Australia, MHS, SCSS++]**). However, of the two studies (one UK, one non-UK) that conducted post-implementation follow-up surveys, both found that increases in medication use were believed to be significantly less than had been anticipated (**Cormac 2010 [England, MHS, BAS+]**; **Haller 1996 [USA, MHS, BAS+]**). One further study (non-UK) conducted in a mental health setting found a marginal level of agreement that use of medication had increased following implementation of smokefree policy (**Voci 2010 [Canada, MHS, RCSS++]**), while another qualitative study (non-UK) conducted in a mental health setting reported that use of medication had not increased post-implementation (**Cooke 1991 [Canada, MHS, CS-]**).

3.11 **Barrier: belief that smokefree policy discourages patients from attending for outpatient appointments.** Two studies (one UK, one non-UK) conducted in mental health settings reported concerns by mental health staff and patients that implementing smokefree policy would discourage patients who smoke from attending for outpatient appointments (**Campion 2008 [Australia, MHS, QS+]**; **HUG 2007 [Scotland, MHS, QS-]**). However, patient experiences reported by one of these studies (UK) indicates that any fall-off in attendance to be short-term (**HUG 2007 [Scotland, MHS, QS-]**).

3.12 **Barrier: belief that smokefree policy results in patients refusing admission and discharging against medical advice.** Eight studies (three UK, five non-UK), seven of which were conducted in mental health settings and one in a broader secondary care setting, reported staff and patient concerns that the implementation of smokefree policy would result in patients refusing admission and treatment, and discharging against medical advice (**HUG 2007 [Scotland, MHS, QS-]**; **Parle 2004 [Canada, MHS, CS-]; McNeill 2007 [Scotland, MHS, QS+]**; **Karan 1993 [USA, MHS, CS-]; Kotz 1993 [USA, MHS, CS-]; Wheeler 2007 [USA, BHS, MMS-]**; **Haller 1996 [USA, MHS, BAS+]**; **Hill 2007 [England, MHS, SCSS++]**). However, in three cases (all non-UK), all relating to mental health settings, examination of patient records failed to indicate any negative impact (**Karan 1993 [USA, MHS, CS-]**; **Kotz 1993 [USA, MHS, CS-]**; **Parle 2004 [Canada, MHS, CS-]**). In three of these cases (one UK, two non-UK), again all relating to mental health settings, staff observations post-implementation were consistent with prior concerns that smokefree policy would have a negative impact on patient retention (**McNeill 2007 [Scotland, MHS, QS+]**; **Karan 1993 [USA, MHS, CS-]; Kotz 1993 [USA, MHS, CS-])**, while in two other cases (both non-UK), one conducted in a mental health setting and the other a broader secondary care setting, concerns about negative impact on patient retention were significantly reduced or no longer existed (**Haller 1996 [USA, MHS, BAS+]**; **Wheeler 2007 [USA, BHS, MMS-]**). One other mental health study (non-UK) found a marginal level of disagreement with statements that elopements' and discharges against medical advice had increased as a result of the smokefree policy (**Voci 2010 [Canada, MHS, RCSS++]**).

3.13 **Barrier: belief that clandestine smoking constitutes an enhanced fire hazard risk.** Eight studies (five UK, three non-UK), seven conducted in mental health settings and one conducted in broader secondary care settings, found that clandestine smoking in

unsupervised, private spaces constituted an enhanced fire hazard risk (**HUG 2007 [Scotland, MHS, QS-]; Karan 1993 [USA, MHS, CS-]; Kotz 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2009a [England, MHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+]**). Three of these studies (two UK, one non-UK), all related to mental health settings, substantiated these risks with reports of patient injuries, burns found on carpets and furniture, and patients extinguishing cigarettes in a dangerous manner in an attempt to evade detection (**Kotz 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**). None of the studies reported fires resulting from clandestine smoking.

3.14 **Barrier: belief that smokefree policy creates additional challenges for patient safety and security.** Eight studies (three UK, five non-UK), four conducted in mental health settings and four in broader secondary care settings, reported staff concerns for patient security and safety relating to patients leaving premises to smoke unsupervised (**Fitzpatrick 2009 [Ireland, BHS, MMS+]; Schultz 2011 [Canada, BHS, QS++]; Wheeler 2007 [USA, BHS, MMS-]; Campion 2008 [Australia, MHS, QS+]; Pritchard 2008 [England, MHS, QS++]**; **McNeill 2007 [Scotland, MHS, QS+]**; **Wye 2010 [Australia, MHS, SCSS++]; Ratschen 2008 [England, BHS, MHS, MMS+])**. Two of these studies (one UK, one non-UK), both conducted in broader secondary care settings, reported cases of patients expressing security and safety concerns [**Schultz 2011 [Canada, BHS, QS++]; Ratschen 2010 [England, MHS, QS++]**]. None of the studies provided evidence of any of these concerns being realised.

3.15 **Inconclusive: belief that smokefree policy has a positive impact on the physical environment.** Five studies (one UK, three non-UK), four conducted in mental health settings and one in broader secondary care settings, found that smokefree policy was believed to have a positive impact on the physical environment, for example, through the removal of smoke from rooms, cleaner facilities, fewer smokers on hospital grounds and improved work conditions (**Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Wye 2010 [Australia, MHS, SCSS++]**; **Steiner 1991 [USA, MHS, BAS+]**; **Voci 2010 [Canada, MHS, RCSS++]**; **Wheeler 2007 [USA, BHS, MMS-]**). Four other studies (two UK, two non-UK), one conducted in mental health settings and three in broader secondary care settings, found that displacement of smoking to perimeter areas following implementation of smokefree policies had an adverse impact on the physical environment through increased congestion and littering around entrances, and people feeling intimidated entering and leaving buildings (**Schultz 2011 [Canada, BHS, QS++]; Tillgren 1998 [Sweden, BHS, QS-]; Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]**).

Contents

1. Introduction

The National Institute for Health and Clinical Excellence (NICE) has been requested by the Department of Health to develop two separate pieces of complementary guidance on:

- 'Smoking cessation in secondary care: acute and maternity services' (NICE, 2011a)
- 'Smoking cessation in secondary care: mental health services' (NICE, 2011b).

The guidance will address smokefree policies and smoking cessation and make recommendations on approaches to help secondary care commissioners, professionals and managers (including patients and service users and their family or carers, visitors and staff) in hospitals and other acute, maternity or mental healthcare settings (including emergency care, planned specialist medical care or surgery, and maternity care provided in hospitals, outpatient clinics, community outreach and rural units, as well as intensive services in psychiatric units and secure hospitals).

There are **five components** of work associated with the guidance development that the CPHE has commissioned:

1. Smoking cessation in acute and maternity services: one review of effectiveness and one review of barriers and facilitators (Reviews 2 & 3).
2. Smoking cessation in mental health services: one review of effectiveness and one review of barriers and facilitators (Reviews 4 & 5).
3. **Smokefree strategies and interventions in secondary care settings: one review of effectiveness and one review of barriers and facilitators (Reviews 6 & 7).**
4. An economic analysis (cost effectiveness review and economic model)
5. Review of effects of nicotine in secondary care (Review 1)

This systematic review is Review 7 for Component 3.

Background and rationale

Awareness of the dangers of second hand smoke (SHS) exposure has been accumulating since the 1970s and it is now well established that SHS causes death and disease (IARC, 2004). Indeed in 2002, the World Health Organization declared that SHS was a human carcinogen (WHO, 2005).
For these reasons smokefree policies and legislation have now been introduced in a number of countries including the UK. The White Paper 'Choosing health: making healthier choices easier' (Department of Health 2004) set a requirement for the NHS to become smoke-free by the end of 2006.

In the UK, the implementation of national legislation varied slightly by country. The Health Act 2006[1] was passed on 16th July 2006 and required that all indoor and substantially enclosed outdoor workplaces and public places in England and Wales became smoke-free by 1st July 2007, specifically banning smoking tobacco. In March 2007, residential mental health settings were given a temporary one year exemption from the implementation date, thus were required to become smoke-free by 1st July 2008[2]. In Northern Ireland, the Smoking (Northern Ireland) Order 2006[3] was made on the 14th

[1] *The Health Act 2006 (c.28)*. Online http://www.legislation.gov.uk/ukpga/2006/28/pdfs/ukpga_20060028_en.pdf
[2] *The Smoke-free (Exemptions and Vehicles) Regulations 2007*. Statutory Instruments 2007 No. 765. Online: http://www.legislation.gov.uk/uksi/2007/765/pdfs/uksi_20070765_en.pdf

November 2006, and enacted as being against the law to smoke in enclosed and substantially enclosed workplaces and public places, and in certain vehicles from 30th April 2007. A temporary one year exemption for designated rooms in residential accommodation in mental health units (for patients 16 years and over) ceased to be in effect from 30th April 2008[4]. And in Scotland, the Smoking, Health and Social Care (Scotland) Act 2005[5] was passed on 30th June 2005, and established that, from 26th March 2006, it was an offence to smoke in any wholly or substantially enclosed public space in Scotland. Under the Act, no-smoking premises in Scotland include hospitals, hospices, psychiatric hospitals, psychiatric units and health care premises, however exemptions were put in place on 26th February 2006 for designated rooms in adult care homes, adult hospices and designated rooms in psychiatric hospitals and psychiatric units[6]. (Information regarding the legislative context for other countries is provided in Appendix 1).

The application of smokefree legislation to mental health units in England was legally challenged by three patients in 2008 on the basis that the legislation was incompatible with the human rights of patients detained under Mental Health Act 1983.[7] It was argued that preventing detained mental health patients from smoking, particularly those patients detained on a long-term basis and in mental health units where it is not feasible to permit patients to smoke outdoors, was a breach of Article 8 of the European Convention on Human Rights, the right to respect for private and family life, as the mental health facility could be considered to be their home. A High Court ruling established that smoking is not a basic human right, and did not uphold the patients' challenge.[8]

Smokefree hospitals are a particularly important component of smokefree legislation because in addition to the links between SHS exposure and leading causes of death such as lung cancer and heart disease, evidence also exists of greater risk of preoperative and postoperative complications for smokers. These complications contribute to longer hospital stays and higher treatment costs (SCoTH, 2004). There is a significantly higher prevalence of smoking among people with mental health problems than among the general population (McNeill, 2001).

Most NHS secondary care settings have smokefree policies that apply to their grounds (as well as enclosed areas), although there have been problems with compliance and enforcement (Ratschen et al 2009c; Shipley and Allcock 2008). Achieving smokefree environments in hospital buildings is challenging, as a number of studies have shown (Lawn and Pols, 2005; Kunyk et al, 2007). This is particularly the case for mental health facilities and for this reason not all psychiatric hospitals in the UK (most notably in Scotland) are smokefree. Variability also exists regarding the extent to which hospital grounds are covered by smokefree policies and the extent to which the introduction of smokefree is linked to services to stop smoking for patients and staff (Ratschen et al 2009c).

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[3] *Smoking (Northern Ireland) Order 2006*. Statutory Instruments 2006 No.2957 (NI 20). Online: http://www.dhsspsni.gov.uk/ifh-smoking-ni-order-2007.pdf

[4] *The Smoke-free (Exemptions, Vehicles, Penalties and Discounted Amounts) Regulations (Northern Ireland) 2007*. Statutory Rules of Northern Ireland 2007 No. 138. Online: http://www.dhsspsni.gov.uk/ifh-smoke-free-_exemptions_-vehicles_-penalties-and-discounted-amounts_-regulations-2008.doc

[5] *The Smoking, Health and Social Care (Scotland) Act 2005 (asp 13)*. Online: http://www.legislation.gov.uk/asp/2005/13/pdfs/asp_20050013_en.pdf

[6] *The Prohibition of Smoking in Certain Premises (Scotland) Regulations 2006*. Scottish Statutory Instruments 2006 No.90. Online: http://www.legislation.gov.uk/ssi/2006/90/pdfs/ssi_20060090_en.pdf

[7] *Mental Health Act 1983 (c.20).* Online: http://www.legislation.gov.uk/ukpga/1983/20/pdfs/ukpga_19830020_en.pdf

[8] R (G) v Nottinghamshire Healthcare NHS Trust [2008] EWHC 1096 (Admin). Online: http://www.bailii.org/ew/cases/EWHC/Admin/2008/1096.html; R (N) v Secretary of State for Health; R (E) v Nottinghamshire Healthcare NHS Trust [2009] EWCA Civ 795. Online: http://www.bailii.org/ew/cases/EWCA/Civ/2009/795.html

Secondary care is defined as “acute healthcare and can be either elective care or emergency care. Elective care means planned specialist medical care or surgery, usually following referral from a primary or community health professional such as a GP” (NHS 2011).

The aim of the study is to systematically review the barriers to and facilitators for implementing smokefree strategies and interventions in secondary care settings (acute, maternity and mental health settings) from the users’ and the providers’ perspectives.

Alongside a related systematic review of the effectiveness of smokefree strategies and interventions in secondary care settings (acute, maternity and mental health settings), its purpose is to support the development by NICE of two separate pieces of complementary public health guidance: a) smoking cessation in secondary care: acute and maternity services, and b) smoking cessation in secondary care: mental health services. The reviews will provide the best available evidence on smokefree strategies and interventions in these settings.

Review questions

Question 1: What are the barriers and facilitators affecting adoption of, support for, and compliance with smokefree policies in secondary care settings?

Subsidiary questions:

- How does support for smokefree policy differ by population group, service provider and type of policy?
- What factors have an impact on acceptance of smokefree policies?
- What are the adverse events and other consequences associated with smokefree policies?

The following sections of the review report on the methodology (Section 2); the review findings, structured around the review questions (Section 3); and the Discussion (Section 4). Lists of the included and excluded papers follow this. Finally, the eight appendices are in a separate document.

2. Methodology

The following methodological stages were conducted at the same time for Reviews 6 (Effectiveness) and 7 (Barriers and Facilitators): the search strategy, title and abstract screening, full text retrieval and full text screening stages. The process was then split for the subsequent stages of the two reviews, Review 7 being reported here.

Search strategy

Sensitive search strategies were developed by an information specialist in conjunction with the research team and peer-reviewed by information specialists at NICE, using a combination of controlled vocabulary and free-text terms. The search strategy was initially developed in MEDLINE and was then adapted to meet the syntax and character restrictions of each database. Searches were run in February 2012. All the literature searches were conducted from 1990 onwards. Sample search strategies can be found in Appendix 2.

The following databases were searched:

AMED (Allied and Complementary Medicine)
ASSIA (Applied Social Science Index and Abstracts)
British Nursing Index
CDC Smoking & Health Resource Library database
CINAHL (Cumulative Index of Nursing and Allied Health Literature)
Cochrane Central Register of Controlled Trials (includes the Cochrane Tobacco Addiction Group Specialist Register)
Cochrane Database of Systematic Reviews (CDSR)
Conference Papers Index (years: 2008-2012)
Database of Abstracts of Reviews of Effectiveness (DARE; 'other reviews' in CDSR database)
Database of Promoting Health Effectiveness Reviews (EPPI Centre DoPHER)
EMBASE
Health Evidence Canada
Health Technology Assessment (HTA) database in the CDSR database
HMIC
International Bibliography of Social Sciences
Medline, including Medline in Process
PsycINFO
Social Policy and Practice
Social Science Citation Index and Conference Proceedings Citation Index
Sociological Abstracts
Trials Register of Promoting Health Interventions (EPPI Centre TRoPHI)
UK Clinical Research Network Portfolio Database

The following websites were also searched for research papers relevant to the review questions (see also, Appendix 4):

Action on Smoking and Health (ASH) http://www.ash.org.uk
Association for the Treatment of Tobacco Use and Dependence (ATTUD) www.attud.org

Canadian Council for Tobacco Control*http://www.cctc.ca/cctc/EN/tcrc/articles/tcarticle.2010-12-24.4349020582
CDC tobacco control and prevention* http://www.cdc.gov/tobacco/
Current controlled trials www.controlled-trials.com
Globalink* http://www.globalink.org/
International Tobacco Control Policy Evaluation Project http://www.itcproject.org
International Union against Cancer http://www.uicc.org
Joseph Rowntree Foundation http://www.jrf.org.uk/publications
National Institute on drug abuse- the science of drug abuse and addiction http://www.nida.nih.gov/nidahome.html
NHS Centre for Smoking Cessation and Training http://www.ncsct.co.uk/
NHS Evidence https://www.evidence.nhs.uk/
NICE http://www.nice.org.uk/
Public health observatories http://www.apho.org.uk/resource/advanced.aspx
Scottish Government http://www.scotland.gov.uk/topics/research
Smoke free http://smokefree.nhs.uk
Society for Research on Nicotine and Tobacco http://www.srnt.org
Tobacco Harm Reduction http://www.tobaccoharmreduction.org/index.htm
Tobacco Information Scotland* http://www.tobaccoinscotland.com/page.cfm?pageid=71
Treat tobacco.net http://www.treatobacco.net/en/index.php
UK Centre for Tobacco Control Studies http://www.ukctcs.org/ukctcs/index.aspx
Welsh Government http://wales.gov.uk/
WHO Tobacco Free Initiative (TIF) http://www.who.int/tobacco/en
World Conference on Tobacco or Health abstracts from 2006, 2009, 2012 conferences* http://2006.confex.com/uicc/wctoh/techprogram; http://www.indianjcancer.com/article.asp?issn=0019-509X;year=2010;volume=47;issue=5;spage=109;epage=210;aulast=#Smokefree%20implementation%20and%20enforcement; http://wctoh2012.org
(*Searched in addition to those listed in Reviews 6 and 7's protocols.)

Electronic files of papers identified from Reviews 1, 2, 3, 4 and 5 that have potential relevance— supplied by those project teams— were also screened for eligibility. The bibliographies of other reviews identified by the search strategy were searched for further studies. As noted above, the World Conference on Tobacco or Health abstracts from the 2006, 2009 and 2012 conferences were searched online.

Studies were managed during the review using the EPPI-Centre's online review software EPPI-Reviewer version 4.0 (ER4) (Thomas et al. 2010). An initial de-duplication procedure was run using EndNote software before uploading the records to ER4.

Title and abstract screening

All records from the searches were uploaded into a database and duplicate records were removed. Where no abstract was available, a web search was first undertaken to locate one; if no abstract could be found, records were screened on title alone and full-text documents were retrieved where there was any doubt.

To trial the inclusion criteria, a pilot round of screening was conducted on a random selection of 30 document titles and abstracts. Piloting was conducted by three reviewers. A reconciliation meeting was then held to discuss disagreements and suggest changes to the inclusion criteria. An additional

three rounds of piloting, with random samples of 25, 25, and 113 records, respectively were conducted to further refine the criteria and achieve consensus. By the fourth round of piloting, a high level of agreement was achieved.

Following the pilot screening, 2,200 records (20%) were double screened. The agreement rate for double-screening was 98.3%, which was considered by the project team and NICE to be sufficiently high. As such, the remaining documents were split between the three reviewers who independently screened their allocated records. Of the double-screened items, any disagreements were resolved by a third reviewer. Throughout the entire process, the reviewers discussed difficult and ambiguous records to ensure consistency.

The final inclusion criteria for Reviews 6 and 7 are presented below (also see Appendix 3 for detailed guidance and definitions used for each criterion). The criteria were applied in a hierarchical manner.

1. The document must be published during or after 1990
2. The document must be published in English
3. The document must report on a piece of empirical research
4. The title and/or abstract must refer to smokefree strategies or interventions (including smoking bans, smoking reduction policies, or programs to reduce environmental tobacco smoke)
5. The study (or a component of it) must be conducted in a secondary care setting or with secondary care staff.
6. If the study is conducted in a community or private residence setting, it must explicitly refer to smokefree policies and be clearly relevant to secondary care workers or services in the title and/or abstract
7. The study design must involve a comparison (e.g. controlled trials, before-and-after) and/or views or process evaluation (e.g. interviews, surveys).

If the study met the above criteria and evaluated the effectiveness of an intervention, it was marked as relevant to Review 6. If the study met the above criteria and included evidence on barriers or facilitators (including knowledge, attitudes and beliefs) to using or implementing smokefree policy it was marked as relevant to Review 7.

After the title and abstract screening stage, full text documents were retrieved for the remaining records.

Full text screening

The retrieved full-text documents were all re-screened for relevance and applicability for inclusion in Review 6 and/or 7 on the basis of the detail available in the full-text article.

The full-text screening process was piloted using ten studies and refined using a further ten studies by four reviewers. Following this, the rest of the studies were divided between different pairings of the same four reviewers and all double-coded in batches. Early inter-rater consistency levels were below the agreed cut-off point, thus double-coding between different pairs maintained a more rigorous process. The reviewers met regularly to discuss uncertain inclusions for both Reviews 6 and 7, and disagreements were resolved by group discussion.

The final inclusion criteria for Review 7 (Barriers and Facilitators) are presented below (also see Appendix 5 for detailed guidance and definitions used for each criterion). The criteria were applied in a hierarchical manner and were the same as points 1 to 6, above, then:

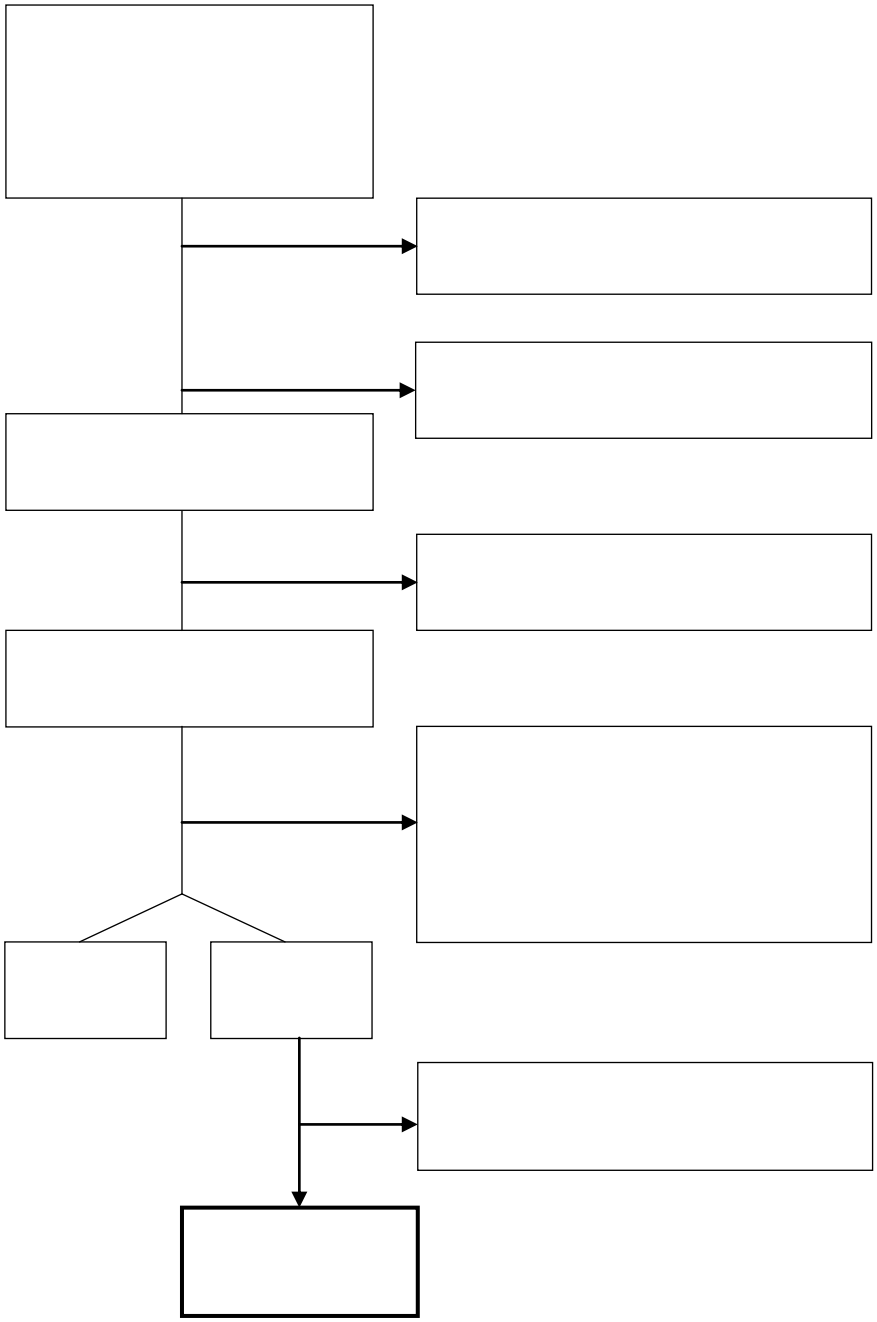
7. The study design must involve views or process evaluation (e.g. interviews, surveys).
8. The study must have been conducted in a high income country as defined by the World Bank (2011) (see Appendix 5 for the list of high income countries used for the purposes of this review).
9. The study must include views (including measures of knowledge, attitudes and beliefs) on any factors that act as barriers or facilitators for secondary care staff in adopting or supporting implementation of smokefree interventions and policies or views (including measures of knowledge, attitudes and beliefs) on any factors that act as barriers or facilitators for service users (including patients and those within their households, carers and service visitors) supporting and complying with smokefree interventions and policies.

The documents that passed the inclusion criteria on the basis of full-text screening were included in Review 7. See Figure 1 for the flow of literature through the review stages.

Data extraction

Data were extracted into an evidence table using the template provided in the methods manual (NICE 2009). Included studies were shared among three reviewers, with the data extracted from the original paper by one reviewer and checked for accuracy by a second. Evidence tables for the included qualitative studies are presented in Appendix 7, and evidence tables for the included quantitative studies are presented in Appendix 8.

Figure 1: Flow of literature chart



1. Teams conducting other reviews to inform guidance on smoking cessation in secondary care.
2. Including an initial de-duplication in EndNote before entering records into Eppi-Reviewer 4 (ER4).
3. Bibliographies' of the reviews were checked for additional relevant studies. Six new studies were identified for full text assessment (two of which were subsequently included in Review 7 (HUG, 2007; Parle, 2004)).

Quality assessment

Included quantitative full-text studies were rated using critical appraisal checklists provided in the methods manual (NICE 2009). Each item on the checklist was coded using the ratings below (see Appendix 6).

++ for that aspect, the study has been designed/conducted in such a way as to minimise the risk of bias
+ the answer is not clear from the way the study is reported, or that the study may not have addressed all potential sources of bias for that aspect
– for those aspects of the study design in which significant sources of bias may persist.
NR not reported
NA not applicable

The full critical appraisal checklists and the score for each checklist item for each study are given in Appendix 6. An overall quality grading score was assigned using the following ratings for internal validity (whether the study's results were unbiased) and external validity (whether the study's findings were generalisable to the source population):

Quantitative: Quality grading for internal validity and external validity

++ All or most of the checklist criteria have been fulfilled, where they have not been fulfilled the conclusions are very unlikely to alter.
+ Some of the checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter.
– Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

Included qualitative full-text studies were quality assessed using the qualitative studies critical appraisal checklist in the methods manual (NICE 2009). Studies were given an overall rating (see Appendix 6) on the basis of how well the study was conducted using the criteria below. The overall score for each study is reported in the evidence table, and as part of each study's citation.

Qualitative: Overall grading of how well the study was conducted

++ all or most of the checklist criteria have been fulfilled, where they have not been fulfilled the conclusions are very unlikely to alter
+ some of the checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter
- few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

The quality assessment process was piloted with a pair of studies by four reviewers followed by discussions about completion. Each study was rated by one reviewer. Through the process of synthesising the review findings the review team familiarised themselves with the details of all the included studies. Two members for the team then collaboratively considered, calibrated and finalised the scores, with disagreements resolved by a third reviewer.

As part of the quality assessment, a study typology was developed for classification purposes. Six study categories and codes were identified as follows:

- **Qualitative study (QS):** Studies which use one or more qualitative data collection methods.
- **Case study (CS):** Studies which describe policy implementation in one or more sites.
- **Single cross-sectional study (SCSS)**: Studies which take quantitative measures at a single time point either before or after implementation; may also incorporate analysis of open-ended survey questions.

- **Repeat cross-sectional study (RCSS):** Studies which take quantitative measures at multiple time points either all before or all after implementation of smokefree; may also incorporate analysis of open-ended survey questions.
- **Before and after study (BAS):** Studies which take quantitative measures at one or more points before implementation and at one or more points after implementation of smokefree; may also incorporate analysis of open-ended survey questions.
- **Mixed methods study (MMS):** Studies which combine qualitative and quantitative data collection methods.

Synthesis methods

Fifty-three studies (with data extracted from 54 papers), published in English since 1990, were included in Review 7 to answer the review questions on the barriers and facilitators affecting the adoption of, support for and compliance with smokefree policies and interventions in secondary care settings. Full study details are provided in the Evidence Tables (Appendices 6 and 7). Summaries of the studies by date order and country relevance are provided in Table 1a for studies conducted in mental health settings and Table 1b for studies conducted in broader secondary healthcare settings. These table also summaries the smokefree context and patients groups covered by each study. Studies are ordered by type of smokefree policy.

Table 1a: Studies conducted in mental health settings by date order and country relevance

Date Range	UK Setting	Non-UK Setting
1990-2000		**Indoor and outdoor smokefree policy** • Haller 1996 [USA, MHS, BAS+]/ **Inpatients/indoor and outdoor smokefree policy** **Indoor only smokefree policy** • Cooke 1991 [Canada, MHS, CS-]/ **Inpatients/indoor smokefree policy** • Erwin 1991 [USA, MHS, BAS-]/ **Inpatients/indoor smokefree policy** • Karan 1993 [USA, MHS, CS-]/ **Inpatients/indoor smokefree policy** (with requirement for inpatients to be abstinent from tobacco) • Kotz 1993 [USA, MHS, CS-]/ **Inpatients/indoor smokefree policy** • Patten 1995 [USA, MHS, BAS+]/ **Inpatient/indoor smokefree policy** (patients with off-unit privileges, at an appropriate level, were granted brief passes to leave the building unaccompanied to smoke) • Steiner 1991 [USA, MHS, BAS+]/ **Inpatients/indoor smokefree policy**
2001-2005		**Indoor and outdoor smokefree policy** • Parle 2004 [Canada, MHS, CS-]/**Inpatients and outpatients /smokefree indoor and outdoor** **Extent of smokefree policy unclear** • Matthews 2005 [USA, MHS, BAS-]/ **Inpatients/extent of smokefree policy unclear**
2006-2012	**Indoor and outdoor smokefree policy** • Cormac 2010 [England, MHS, BAS+]/ **Inpatients/smokefree indoor and outdoor policy** • Pritchard 2008 [England, MHS, QS++]/**inpatients and outpatients/indoor and outdoor smokefree policy** • Ratschen 2009a [England, MHS, QS++]/ **Inpatients/indoor and outdoor smokefree policy** • Ratschen 2009b [UK, MHS, SCSS++]/ **Inpatients/indoor and outdoor smokefree policy**	**Indoor and outdoor smokefree policy** • Drach 2012 [USA, MHS, QS-]/ **Inpatients/indoor and outdoor smokefree policy** • Jessup 2007 [USA, MHS, QS++]/ **Inpatients/ indoor and outdoor smokefree** (clients were required to abstain from smoking entirely while enrolled in the residential program) • Johnson 2010 [Canada, MHS, QS++]/ **Outpatients/indoor and outdoor smokefree policy** • Steiner 2009 [USA, MHS, SCSS+]/**inpatients and outpatients/indoor and outdoor**

	• Ratschen 2010 [England, MHS, QS++]/ **Inpatients/indoor and outdoor smokefree policy** **Indoor only smokefree policy** • Garg 2009 [England, MHS, SCSS+]/ **Inpatients/indoor smokefree policy** • Hill 2007 [England, MHS, SCSS++]/ **Inpatients/indoor smokefree policy (proposed)** • Mental Health Foundation 2009 [England, MHS, SCSS+]/ **Inpatient/indoor smokefree legislation** • Praveen 2009 [England, MHS, SCSS+]/ **Inpatient/indoor smokefree legislation** • Smith 2008 [England, MHS, SCSS+]/ **Inpatients/indoor smokefree policy** • Wareing 2012 [England, MHS, QS+]/**inpatients and outpatients/indoor smokefree legislation** **Extent of smokefree policy unclear/not applicable** • Bloor 2006 [England, MHS, SCSS+]/**not specified/ extent of smokefree policy unclear** • HUG 2007 [Scotland, MHS, QS-]/ **Outpatients/not applicable** • McNeill 2007 [Scotland, MHS, QS+]/**not specified/not applicable**	**smokefree policy** • Wye 2010 [Australia, MHS, SCSS++]/**Inpatients/indoor and outdoor smokefree policy** **Indoor only smokefree policy** • Campion 2008 [Australia, MHS, QS+]/ **Inpatients/indoor smokefree policy** • Etter 2008 [Switzerland, MHS, BAS+]/ **Inpatients/indoor smokefree policy** • Voci 2010 [Canada, MHS, RCSS++]/**inpatients and outpatients/indoor smokefree policy** (smoking prohibited within a 9 meter radius of any building entrance)

Table 1b: Studies conducted in broader secondary healthcare settings by date order and country relevance

Date Range	UK Setting	Non-UK Setting
1990-2000	**Indoor only smokefree policy** • Seymour 2000 [England, BHS, CS-]/**inpatients and outpatients/indoor smokefree** (some Trusts had policies that included outdoor smoking restrictions)	**Indoor and outdoor smokefree policy** • Hudzinski 1990 [USA, BHS, BAS+]/**not specified/indoor and outdoor smokefree policy** (exclusion: smoking permitted on the acute psychiatry inpatient unit by physician approval) **Indoor only smokefree policy** • Baile 1991 [USA, BHS, SCSS+]/**not specified/indoor smokefree** • Daughton 1992 [USA, BHS, RCSS-]/**not specified/indoor smokefree** • Rosen 1995 [USA, BHS, SCSS+]/**not specified/indoor smokefree policy** • Stillman 1995 [USA, BHS, SCSS+]/**inpatients/indoor smokefree policy** • Tillgren 1998 [Sweden, BHS, QS-]/**inpatients and outpatients/indoor smokefree policy**
2001-2005		**Indoor only smokefree policy** • Donchin 2004 [Israel, BHS, BAS+]/**inpatients and outpatients/indoor smokefree policy** • Kannegaard 2005 [Denmark, BHS, RCSS++]/**not specified/indoor smokefree policy** • Ullen 2002 [Sweden, BHS, RCSS+]/**inpatients and outpatients/indoor smokefree policy**
2006-2012	**Indoor and outdoor smokefree policy** • Lewis 2011 [Wales, BHS, SCSS+]/**inpatients and**	**Indoor and outdoor smokefree policy** • Sheffer 2009 [USA, BHS, BAS+]/**inpatients and**

	outpatients/indoor and outdoor smokefree policy • Parks 2009 [England, BHS, SCSS+]/**inpatients and outpatients/indoor and outdoor smokefree policy** **Indoor only smokefree policy** • Ratschen 2008 [England, BHS, MHS, MMS+]/**inpatients/indoor smokefree** (some Trusts also had outdoor smokefree policies, and some Trusts had exclusions) **Extent of smokefree policy unclear** • Arack 2009 [England, BHS, SCSS-]/**inpatients and outpatients/extent of smokefree policy not reported** • Shipley 2008 [England, BHS, SCSS+]/**inpatients and outpatients/extent of smokefree policy not reported**	**outpatients/indoor and outdoor smokefree policy** • Wheeler 2007 [USA, BHS, MMS-]/**not specified/indoor and outdoor smokefree** (and smokefree vehicles) **Indoor only smokefree policy** • Fitzpatrick 2009 [Ireland, BHS, MMS+]/**inpatients and outpatients/indoor smokefree** (outdoor smokefree impending) • Jones 2010 [Australia, BHS, SCSS+]/**inpatients and outpatients/indoor smokefree** • Patterson 2008 [Canada, BHS, QS++]/**inpatients and outpatients/indoor smokefree** • Schultz 2011 [Canada, BHS, QS++]/**inpatients/indoor smokefree and smokefree doorways** (exclusions: Wards providing palliative, hospice or psychiatric care or care for chemical-dependence) • Vardavas 2009 [Greece, BHS, SCSS-]/**inpatients and outpatients/indoor smokefree policy**

Sample characteristics

Forty-eight of the studies included in this review were published in academic or practitioner journals, four were published as reports and one is an unpublished report. Nineteen of the included studies used designs that provided qualitative evidence and 29 of the studies used a study design that provided quantitative evidence relevant for this review. Five studies produced both qualitative and quantitative data relevant to the review.

Year of publication: Thirteen of the 53 included studies were published in the 1990s, with only one of these (a Swedish study) conducted outside North America (one from 1990, four from 1991, one from 1992, two from 1993, three from 1995, one from 1996 and one from 1998). Forty included studies were published in the last 12 years, with most (n=28) published since 2008 and mostly conducted in European countries (see the country summary below): (one from 2000, one from 2002, two from 2004, two from 2005, one from 2006, five from 2007, seven from 2008, eleven from 2009, six from 2010, two from 2011 and two from 2012).

Country: The majority (n=20) of the 53 included studies were from the **UK**: 16 were conducted in **England** [Seymour 2000 [England, BHS, CS-], Bloor 2006 [England, MHS, SCSS+], Hill 2007 [England, MHS, SCSS++], Pritchard 2008 [England, MHS, QS++], Shipley 2008 [England, BHS, SCSS+], Smith 2008 [England, MHS, SCSS+], Ratschen 2008 [England, BHS, MHS, MMS+], Arack 2009 [England, BHS, SCSS-], Garg 2009 [England, MHS, SCSS+], Parks 2009 [England, BHS, SCSS+], Praveen 2009 [England, MHS, SCSS+], Mental Health Foundation 2009 [England, MHS, SCSS+], Ratschen 2009a [England, MHS, QS++], Cormac 2010 [England, MHS, BAS+], Ratschen 2010 [England, MHS, QS++], Wareing 2012 [England, MHS, QS+]], two in **Scotland** [HUG 2007 [Scotland, MHS, QS-], McNeill 2007 [Scotland, MHS, QS+]], one in **Wales** [Lewis 2011 [Wales, BHS, SCSS+]] and one was not specified [Ratschen 2009b [UK, MHS, SCSS++]]. A further six studies were from Europe, two from **Sweden** [Tillgren 1998 [Sweden, BHS, QS-], Ullen 2002 [Sweden, BHS, RCSS+]] one from **Denmark** [Kannegaard 2005 [Denmark, BHS, RCSS++]], one from **Greece** [Vardavas 2009 [Greece, BHS, SCSS-]], one from **Ireland** [Fitzpatrick 2009 [Ireland, BHS, MMS+]] and one from **Switzerland** [Etter 2008 [Switzerland, MHS,

BAS+]]. Seventeen of the included studies were conducted in the **USA** [Hudzinski 1990 [USA, BHS, BAS+], Baile 1991 [USA, BHS, SCSS+], Erwin 1991 [USA, MHS, BAS-], Steiner 1991 [USA, MHS, BAS+], Daughton 1992 [USA, BHS, RCSS-], Karan 1993 [USA, MHS, CS-], Kotz 1993 [USA, MHS, CS-], Patten 1995 [USA, MHS, BAS+], Stillman, 1995 +, Rosen 1995 [USA, BHS, SCSS+], Haller 1996 [USA, MHS, BAS+], Matthews 2005 [USA, MHS, B&A-], Jessup 2007 [USA, MHS, QS++], Wheeler 2007 [USA, BHS, MMS-], Sheffer 2009 [USA, BHS, BAS+], Steiner 2009 [USA, MHS, SCSS+], Drach 2012 [USA, MHS, QS-]]; six studies were conducted in **Canada** [Cooke 1991 [Canada, MHS, CS-], Parle 2004 [Canada, MHS, CS-], Patterson 2008 [Canada, BHS, QS++], Johnson 2010 [Canada, MHS, QS++], Voci 2010 [Canada, MHS, RCSS++], Schultz 2011 [Canada, BHS, QS++]]; three in **Australia** [Campion 2008 [Australia, MHS, QS+], Jones 2010 [Australia, BHS, SCSS+], Wye 2010 [Australia, MHS, SCSS++]]; and one in **Israel** [Donchin 2004 [Israel, BHS, BAS+]]. It was an inclusion criterion that studies were required to be conducted in a high-income country to ensure relevance to a UK secondary care settings.

Secondary healthcare setting: Thirty-one of the 53 included studies were conducted exclusively in **mental health settings** [Drach 2012 [USA, MHS, QS-], Wareing 2012 [England, MHS, QS+], Cormac 2010 [England, MHS, BAS+], Johnson 2010 [Canada, MHS, QS++], Ratschen 2010 [England, MHS, QS++], Voci 2010 [Canada, MHS, RCSS++], Wye 2010 [Australia, MHS, SCSS++], Garg 2009 [England, MHS, SCSS+], Mental Health Foundation 2009 [England, MHS, SCSS+], Praveen 2009 [England, MHS, SCSS+], Ratschen 2009a [England, MHS, QS++], Ratschen 2009b [UK, MHS, SCSS++], Steiner 2009 [USA, MHS, SCSS+], Campion 2008 [Australia, MHS, QS+], Etter 2008 [Switzerland, MHS, BAS+], Pritchard 2008 [England, MHS, QS++], Smith 2008 [England, MHS, SCSS+], Hill 2007 [England, MHS, SCSS++], HUG 2007 [Scotland, MHS, QS-], Jessup 2007 [USA, MHS, QS++], McNeill 2007 [Scotland, MHS, QS+], Bloor 2006 [England, MHS, SCSS+], Matthews 2005 [USA, MHS, BAS-], Parle 2004 [Canada, MHS, CS-], Haller 1996 [USA, MHS, BAS+], Patten 1995 [USA, MHS, BAS+], Karan 1993 [USA, MHS, CS-], Kotz 1993 [USA, MHS, CS-], Cooke 1991 [Canada, MHS, CS-], Erwin 1991 [USA, MHS, BAS-], Steiner 1991 [USA, MHS, BAS+]]. The majority of these were studies from the UK (n=14), ten were from the USA, four from Canada, two from Australia and one from Switzerland. Most of the included studies conducted in mental health settings were published in the last decade, since 2004 (n=24). Sixteen studies provided quantitative views data and 15 studies in this setting provided qualitative views data.

Twenty-one of the 53 included studies were conducted in secondary care settings that may have also included mental health services or wards but the authors were not specific about this. For the purpose of this review, these settings are referred to as **broader secondary care settings**, and include acute and maternity secondary care [Lewis 2011 [Wales, BHS, SCSS+], Schultz 2011 [Canada, BHS, QS++], Jones 2010 [Australia, BHS, SCSS+], Arack 2009 [England, BHS, SCSS-], Fitzpatrick 2009 [Ireland, BHS, MMS+], Parks 2009 [England, BHS, SCSS+], Sheffer 2009 [USA, BHS, BAS+], Vardavas 2009 [Greece, BHS, SCSS-], Patterson 2008 [Canada, BHS, QS++], Shipley 2008 [England, BHS, SCSS+], Wheeler 2007 [USA, BHS, MMS-], Kannegaard 2005 [Denmark, BHS, RCSS++], Donchin 2004 [Israel, BHS, BAS+], Ullen 2002 [Sweden, BHS, RCSS+], Seymore 2000 -, Tillgren 1998 [Sweden, BHS, QS-], Stillman, 1995 +, Rosen 1995 [USA, BHS, SCSS+], Daughton 1992 [USA, BHS, RCSS-], Baile 1991 [USA, BHS, SCSS+], Hudzinski 1990 [USA, BHS, BAS+]]. The majority of the included studies were from the UK (n=6) and the USA (n=6); the UK studies being published more recently (2000 and 2008-2011) and the USA published over two decades (1990-1995 and 2007-2009). Two studies were from Canada, two from Sweden and one each from Australia, Denmark, Greece, Ireland and Israel. Seventeen studies provided quantitative views data and 9 studies in this setting provided qualitative views data.

One of the studies included in the review collected and reported both quantitative and qualitative data for NHS Acute Trusts and NHS mental health settings separately in the UK [Ratschen 2008 [England, BHS, MHS, MMS+]].

None of the studies included in the review specifically referred to a maternity secondary care setting, however one study was set in a residential perinatal drug and alcohol treatment and recovery services centre [Jessup 2007 [USA, MHS, QS++]].

Study design: Of the 34 included studies which provided relevant quantitative results, all were observational studies. Twenty-three of the studies used a cross-sectional design to collect views data, 10 used a before-and-after design, and one study collected some before-and-after smokefree data and some cross-sectional data. Of the 24 included studies which provided relevant qualitative results, a range of study designs were used and nine used mixed qualitative methods to collect relevant views data. Fifteen studies conducted interviews with participants and seven used questionnaires; six were described as case studies; five studies used observation techniques; three studies used focus groups and one a 'discussion meeting'; and one study used document analysis.

Quality

Qualitative Studies: On the basis of the quality assessment of the 24 studies that used qualitative methods, ten studies were rated as providing low quality (-) qualitative evidence; seven studies were rated as providing high quality (++) qualitative evidence; and seven studies were rated as providing moderate quality (+) qualitative evidence. See Appendix 6 for the quality scores of individual studies.

Quantitative Studies: On the basis of the quality assessment of the 34 studies that used quantitative methods, 23 studies were rated as '+'for overall internal validity; six were rated as '-'for overall internal validity; and five studies were rated as '++'for overall internal validity. Twenty-two studies were rated as '+' for external validity, six studies were rated as '-' and six studies were rated as '++' for external validity. See Appendix 6 for the quality scores of individual studies.

Narrative Synthesis

A narrative synthesis approach is used to address the review's research question 'What are the barriers and facilitators affecting adoption of, support for, and compliance with smokefree policies in secondary care settings?' This broad question is addressed by answering three subsidiary questions:

1. How does support for smokefree policy differ by population group, service provider and type of policy?
2. What factors have an impact on acceptance of smokefree policies?
3. What are the adverse events and other consequences associated with smokefree policies?

The findings of the review are structured around these three subsidiary questions. These were reorganised from those in the Protocol when the final data set was identified, with agreement from NICE. Under each question, short summaries describing the key features of the studies that answer that question are presented. Then, for each question, the identified evidence is presented under appropriate barrier/facilitator sub-themes. Themes and sub-themes were derived from factors relating to acceptance of smokefree policy, including factors affecting adoption of, support for, and compliance with smokefree policies. Initially, the reviewers drew on factors already identified in the

protocol, and some of those acknowledged in findings from a recent implementation guidance document (The Research Shop 2010) to develop a thematic framework which formed the basis for the evidence tables. The data grouped under these themes were then re-read by members of the team and through a process of discussion and synthesis the subsidiary questions were reorganised and the framework gradually refined to identify 18 main themes. In some cases this process involved re-reading the original article in order to better understand the context for some findings. Given the greater diversity of qualitative data, the framework was initially devised to represent these data and then subsequently reassessed and further modified to accommodate the quantitative data. Quantitative outcome measures of views and attitudes included in the review comprise of: attitudes towards current and proposed smokefree regulations; attitudes towards implementation process; beliefs about smoking as a right; challenges anticipated and experienced; and perceived benefits. Qualitative and quantitative evidence is presented separately for each sub-theme. Evidence statements for each sub-theme are given, drawn from both the qualitative and quantitative evidence together. Statements on the applicability of the evidence statements to the UK setting are given. Citations throughout the findings section are of the format: (Lead author, publication date, country, setting code, study type code, internal validity score [for quantitative evidence]/overall quality score [for qualitative evidence]).

3. Findings

Q1: How does support for smokefree policy differ by population group, service provider and type of policy?

Views on support of smokefree policy are grouped under three themes: level of staff support for smokefree policy; level of patient support for smokefree policy; and preferences for type of smokefree policy. Brief summaries of the studies used to answer this research question are given in **Figure 2**.

Figure 2: Question 1 study summaries

Qualitative and quantitative evidence

Arack 2009 [England, BHS, SCSS-] conducted a survey to explore the effect of a complete smoking ban at an NHS Trust, focusing on staff attitudes, staff compliance, and staff smoking behaviour. The survey took place 17 months after implementation of the ban. A total of 160 staff were recruited to take part in the survey through opportunity sampling. Outcome measures were support for smoking ban, and opinions about enforcement of the ban. Thematic analysis was used to identify the main themes emerging from responses to the survey's open-ended questions.

Fitzpatrick 2009 [Ireland, BHS, MMS+] carried out a survey of staff and patient attitudes at an acute general hospital with an indoor ban in place, and plans to transition to a complete campus-wide ban. A total of 295 patients and 225 staff took part in the study. The relevant attitudinal result was support for the planned introduction of a campus-wide ban. In addition, short 5-15 minute attitudinal interviews were conducted with smoking patients (n=28) and staff (n=30).

Ratschen 2008 [England, BHS, MHS, MMS+] explored the impact and challenges of implementation of smokefree policy in NHS acute and mental health Trusts. Questionnaire based surveys were sent to all NHS acute and mental health Trusts, of which representatives from 186 Trusts completed questionnaires (72 mental health trusts and 114 Acute Trusts). At the time of the survey, the majority of Trusts had implemented smokefree policies. Relevant attitudinal results included: views about experience of staff support; views about the effect of smokefree on patient mental health (mental health settings only); beliefs about the effect of smokefree on patient medication needs (mental health settings only); views about the effect of smokefree policies on the staff-patient relationship; views about enforcement and compliance. Questionnaires were supplemented with semi-structured telephone interviews with 22 respondents and direct observation at a sample of 15 Trusts (22 different sites).

Sheffer 2009 [USA, BHS, BAS+] explored the attitudes and beliefs of hospital CEOs (Chief Executive Officers)/administrators in one US State towards smokefree legislation 6 months before (n=84) and 1 year after (n=68) legislation became effective. The surveys assessed support for the legislation, support for and resistance to smokefree anticipated/experienced from stakeholders (staff, patients, visitors etc.), and views about the challenges of implementing the legislation. The surveys included a number of open-ended questions.

Wheeler 2007 [USA, BHS, MMS-] evaluated the impact of a total smoking ban at a university hospital (site 1), and an employee smoking ban at a private children's hospital on the hospital campus (site 2). Staff were surveyed at site 1 three months before implementation of the ban (n=842) and 10 months after implementation (n=912). Staff were surveyed at site 2 two months after implementation of the staff smoking ban (n=183). The surveys assessed: support for policy; belief that the policy would make/made the site healthier and safer; belief that the policy would set/set a good example for patients. In addition, focus group discussions were conducted with supervisors (n=7) and security personnel (n=4), and key informant interviews were carried out with hospital administrators (n=8) at site 1 after implementation of the ban.

Quantitative evidence only

Bloor 2006 [England, MHS, SCSS+] conducted a questionnaire survey to investigate the impact of a smokefree policy in a newly opened English mental health hospital on the smoking behaviour and attitudes of nursing staff. A total of 92 nurses completed the questionnaire. Relevant outcome measures were support for ban, beliefs about right to smoke, and attitudes towards enforcement of the policy.

Cormac 2010 [England, MHS, BAS+] evaluated the impact of a total smoking ban in a high security long-stay psychiatric hospital. Postal surveys of staff were conducted at two time points: 1 pre-implementation (n=1038), and 1 post-implementation (n=670). Relevant outcome measures were support for the ban, beliefs about the effect of the ban on

patient aggression and patient management, beliefs about the effect of the ban on patient medication needs. Postal surveys of patients were conducted at two time points: 1 pre-implementation (n=175), and 1 post-implementation (n=115). Relevant outcome measures were support for ban, and beliefs about the effect of the ban on patient and physical and mental health.

Daughton 1992 [USA, BHS, RCSS-] explored the effects of an indoor smoking ban in a hospital on hospital employees. The first survey was conducted 5 months before policy implementation (n=1070), and the follow up was carried out 17 months after implementation (n=88). Relevant attitudinal outcome measures were support for the ban, and views about the perceived difficulty complying with the ban.

Donchin 2004 [Israel, BHS, BAS+] evaluated the implementation of an indoor smoking ban at a university hospital. Staff surveys were carried out 3 months before implementation (n=368), and 6-9 months post implementation (n=364). Simple random sampling was used to select participants. Relevant attitudinal outcome measures were attitudes towards extant hospital smoking regulations, and attitudes towards smoking in the workplace.

Erwin 1991 [USA, MHS, BAS-] assessed the attitudes of nursing staff (n=29) of two inpatient psychiatric wards to the implementation of smokefree policy. Questionnaire surveys were carried out before implementation, 1 week after implementation, and 4 weeks after implementation. The relevant attitudinal result was staff support for smokefree policy.

Etter 2008 [Switzerland, MHS, BAS+] compared the attitudes of staff and patients towards a partial smoking ban and a complete smoking ban in two adult psychiatric units. Questionnaire surveys were carried out at 2 time points: before implementation of the indoor ban (n=106: n=49 patients, n=57 staff); after implementation of complete ban (n=134: n=77 patients; n=57 staff). Relevant outcome measures were attitudes towards extant smoking restrictions, and knowledge and understanding of hospital smokefree policy.

Garg 2009 [England, MHS, SCSS+] explored staff attitudes towards an indoor smoking ban at a medium secure psychiatric unit. Staff (n=116) were interviewed 4 months after policy implementation. Relevant outcome measures were: support for the ban; beliefs about the success of implementation; and views about positive effects of the ban.

Haller 1996 [USA, MHS, BAS+] studied the effects of a complete smoking ban in a locked psychiatric unit. Staff and patients were surveyed 1 month before implementation (staff n=67; patients n=21). Staff were also surveyed 1 month after implementation (n=53), and patients were surveyed 2-4 months after implementation (n=93). The survey measured attitudes towards the ban, and its perceived impact on patients and the ward.

Hudzinski 1990 [USA, BHS, BAS+] assessed staff and patient support for a smoking ban in a healthcare institution. Questionnaire surveys were mailed to all staff and to randomly selected patients at three time points: 6 months before implementation of the ban (n=607 patients, n=1946 staff); 6 months after implementation of the ban (n=397 patients; n=1608 staff); 12 months after implementation of the ban (n=600 patients; n=684 staff).

Jones 2010 [Australia, BHS, SCSS+] carried out questionnaire surveys to assess staff attitudes towards smoking on hospital grounds at a general hospital with an indoor ban in place, and compared this with staff attitudes at three other Australian hospitals that also had indoor bans. Specifically, a questionnaire survey was used to assess staff views on the acceptability of visible smoking areas on hospital grounds, support for a complete ban, and support for providing smoking areas.

Kannegaard 2005 [Denmark, BHS, RCSS++] investigated staff attitudes towards smoking restrictions at a hospital. Surveys were conducted at two time points, both before implementation of a total smoking ban. A total of 729 staff took part in the first survey, and 729 staff also took part in the second survey. The surveys assessed satisfaction with hospital smoking restrictions, and attitudes towards the implementation of sanctions towards staff who do not comply with these restrictions.

Lewis 2011 [Wales, BHS, SCSS+] assessed staff support for smokefree policy, and policy preferences in a health board with a total smoking ban in place. Five hundred staff were recruited to take part in the survey using opportunistic sampling.

Matthews 2005 [USA, MHS, B&A-] evaluated the implementation of a smoking ban on an acute psychiatric unit for men. Staff were surveyed before (n=14) and after implementation of the ban (n=13). The surveys covered beliefs about benefits of the ban, beliefs about the ethics of the ban, and views about the problems anticipated/experienced as a result of the ban.

Parks 2009 [England, BHS, SCSS+] assessed staff attitudes at a hospital with a total smoking ban in place. A total of 704 staff took part in the survey. Specifically, the survey assessed support for the hospital's policy, awareness of the policy,

beliefs about enforcement, and beliefs about the beneficial effects of smokefree policy in terms of protecting people from second hand smoke.

Patten 1995 [USA, MHS, BAS+] evaluated the effects of the implementation of a total smoking ban at an adult locked in-patient psychiatric unit. Staff were surveyed 6 months before implementation (n=137) and 6 months after implementation (n=126). The surveys assessed staff support for the smokefree policy, and views about expected/observed success of implementation.

Praveen 2009 [England, MHS, SCSS+] explored staff (n=308) attitudes towards an impending indoor smoking ban at three in-patient mental health units. Relevant attitudinal results were staff views about where staff and patients should be allowed to smoke, beliefs about whether staff should be allowed to smoke with patients, and beliefs about the effects of smokefree on patient mental and physical health.

Rosen 1995 [USA, BHS, SCSS+] carried out a survey to explore patient (n=329) attitudes to smokefree policy at a teaching hospital with an indoor smoking ban in place. A survey assessed patient satisfaction with the policy, preferred smokefree policy, and knowledge and understanding of the policy.

Smith 2008 [England, MHS, SCSS+] assessed patient (n=135) smoking policy preferences in thirteen mental health wards in an NHS Trust with an impending indoor smoking ban.

Steiner 1991 [USA, MHS, BAS+] assessed staff and patient attitudes towards smokefree policy at a mental health day hospital. Surveys were carried out 1 week prior to a move to new smokefree premises (n=17 patients; n=15 staff), and two weeks after the move (n=15 patients; n=17 staff). The surveys assessed staff and patient support for the policy, and beliefs about the effect of the move to a smokefree facility on patient mental health.

Steiner 2009 [USA, MHS, SCSS+] assessed staff (n=175) support for an impending complete smoking ban at a mental health facility.

Stillman 1995 [USA, BHS, SCSS+] examined smoking inpatient's knowledge of, attitude towards, and compliance with an indoor smoking ban at a 1,000 bed urban teaching hospital in Maryland. Patients (n=504) were interviewed within 3 days of being admitted to the hospital.

Ullen 2002 [Sweden, BHS, RCSS+] assessed staff satisfaction with smoking restrictions at a large university hospital with an indoor smoking ban in place. Forty-one heads of department and 517 hospital employees took part in the study.

Vardavas 2009 [Greece, BHS, SCSS-] assessed staff (n=100) support for smokefree hospitals and staff smokefree policy preferences at a large university hospital with an indoor smoking ban.

Voci 2010 [Canada, MHS, RCSS++] explored staff attitudes towards and experiences of implementation of an indoor and partial-outdoor smoking ban at a centre for mental health and addiction at two time points after policy implementation: 2-7 months after implementation (n=430); and 31-33 months after implementation (n=400). The surveys assessed: support for the policy; beliefs about the beneficial effects of smokefree policy on the hospital environment; views about the right to smoke/right to be protected from second hand smoke; beliefs about the effect of smokefree policy on patient mental and physical health; beliefs about the effect of smokefree policy on patient aggression and patient management; beliefs about the effects of the policy on patient medication needs; beliefs about the effect of the policy on safety; and beliefs about the effect of the policy on patient retention.

Wye 2010 [Australia, MHS, SCSS++] explored staff attitudes towards an impending total smoking ban at a psychiatric inpatient hospital. A total of 183 staff were surveyed 2 weeks before the ban was due to be implemented. As well as assessing staff support for the ban, the survey assessed beliefs about the potential effects of the ban on: patient physical health; patient mental health; patient management and patient aggression; patient medication needs; staff working conditions; patient quality of life; quality of care; staff workload; rapport between patients; and hospital safety. The study also explored clinician views about perceived barriers to implementation of the policy.

1.1 Level of staff support for smokefree policy

Qualitative findings

No qualitative evidence was identified relating to this theme

Quantitative findings

Twenty-five quantitative studies assessed levels of staff support for smokefree policy (**Arack 2009 [England, BHS, SCSS-]; Bloor 2006 [England, MHS, SCSS+]; Cormac 2010 [England, MHS, BAS+]; Daughton 1992 [USA, BHS, RCSS-]; Donchin 2004 [Israel, BHS, BAS+]; Erwin 1991 [USA, MHS, BAS-]; Etter 2008 [Switzerland, MHS, BAS+]; Fitzpatrick 2009 [Ireland, BHS, MMS+]; Garg 2009 [England, MHS, SCSS+]; Haller 1996 [USA, MHS, BAS+]; Hudzinski 1990 [USA, BHS, BAS+]; Jones 2010 [Australia, BHS, SCSS+]; Kannegaard 2005 [Denmark, BHS, RCSS++]; Lewis 2011 [Wales, BHS, SCSS+]; Matthews 2005 [USA, MHS, BAS-]; Parks 2009 [England, BHS, SCSS+]; Patten 1995 [USA, MHS, BAS+]; Ratschen 2008 [England, BHS, MHS, MMS+]; Steiner 1991 [USA, MHS, BAS+]; Steiner 2009 [USA, MHS, SCSS+]; Ullen 2002 [Sweden, BHS, RCSS+]; Vardavas 2009 [Greece, BHS, SCSS-]; Voci 2010 [Canada, MHS, RCSS++]; Wheeler 2007 [USA, BHS, MMS-]; Wye 2010 [Australia, MHS, SCSS++]).** These studies are summarised in the **Table 2**.

Table 2: Data summaries for studies measuring staff support for smokefree

Study details **Country** **Where** **Study design** **(when measured)**	**Sample** **Total sample** **Sample characteristics**	**Staff support for smokefree**
Arack (2009) England Isle of Wight NHS Acute Trust. **Cross-sectional study** (2007. After smokefree implementation)	Total sample: n=160 staff 48.4% never smokers, 27% ex-smokers, 19.5% smokers, 5% occasional smokers. Occupational groups: 38% nursing, 30.9% admin/clerical, 17.8% allied health professions, 2.0% science and professional, 5.3% technical, 3.9% medical, 1.3% auxiliary.	78.3% of respondents supported the smoking ban on hospital grounds.
Bloor (2006) England A modern, purpose-built psychiatric unit in Stoke on Trent. **Cross-sectional study** (After smokefree implementation)	Total sample: n=92 Nursing grade A–D 44.6% (n=41), Nursing grade E 25.0% (n=23), Nursing grade F 7.6% (n=7), Nursing grade G 7.6% (n=7), Nursing grade H 1.1% (n=1), Nursing grade I n=0, Senior Manager n=0, Did not specify 14.1% (n=13); Smokers 34.78%, Former Smokers 34.78%, Never smokers 30.43%; <21 years n=0, 21-30 years 22.8% (n=21), 31-40 years 29.3% (n=27), 41-50 years 31.5% (n=29), >50 years 16.3% (n=15); Male 33.7% (n=31), Female 65.2% (n=60), Did not specify 1.1% (n=1); White 97.8% (n=90), Mixed race n=0, Asian/British n=0, Black/Black British 2.2% (n=2), Chinese/other n=0.	Overall, 57.7% nursing staff respondents (40.61% smokers, 62.6% former smokers and 71.4% never smokers) agreed with the statement "A restrictive smoking policy in hospitals is a good idea". Overall, 44.6% nursing staff respondents (15.61% smokers, 53.1% former smokers and 53.6% never smokers) agreed with the statement "I support the smoking policy of the Health Trust". Overall, 41.3% nursing staff respondents (59.1% smokers, 43.7% former smokers and 46.5% never smokers) agreed with the statement "Health Trusts have to fulfil an exemplary role in the field of worksite non-smoking policies". No further statistical information is available.
Cormac (2010) England A high secure, long-stay psychiatric hospital for patients with complex mental health disorders who are a grave and immediate danger to the public or themselves (the majority have committed serious offences). **Before-and-after study**	Total sample: Staff n=1038 (pre-ban) n=670 (post-ban) Pre-ban: 46% male, 23% smokers pre-ban, 61% nursing staff. Post-ban: 38% male, 22% smokers pre-ban, 54% nursing staff.	In favour of the ban: Pre-ban 528/1038 (50.9%). Post-ban 404/670 (60.3%). Changed in favour of smokefree. No further statistical information is available.

(Feb 2007: before smokefree implementation. July 2007: after smokefree implementation)		
Daughton (1992) USA, Nebraska A hospital (no further details given). **Cross-sectional study** (2 timepoints after smokefree implementation: 5 months post-implementation; 17 months post-implementation)	Total sample: Survey 1: n=1070; Survey 2: n=88 Survey 1: n=589 non-smokers, n=284 ex-smokers (self-report abstinent for >5 months prior to ban announcement), n=16 ban-year quitters (self-report abstinent for ≥3 months), n=181 smokers (n=55 light smokers <10 cigs/day, n=110 moderate smokers 10-29 cigs/day, n=22 heavy smokers ≥30 cigs/day). Occupations (of those who identified themselves) included: physicians, nurses, cafeteria workers, painters, mail room clerks, laboratory technicians, administrators, secretaries, researchers and environmental service workers.	Support for the smoking ban: Five months after implementation of a total indoor ban on smoking, and one year after it was announced, 89% non-smokers staff (n=523), 86% ex-smokers (those who quit before the ban was announced) (n=245), 81% of ban-year quitters (n=13) and 45% smokers (n=82) supported the ban. Significant sub-group differences: Five months after implementation of a total indoor ban on smoking, only 27% of heavy smokers staff (≥30 cigs/day) (n=6) compared with 64% of light smokers (<10 cigs/day) (n=34) favoured the policy ($p<0.05$). Five months after implementation of a total indoor ban on smoking, 74% staff smokers who wanted to stop smoking "a lot" (n=26) compared with only 15% smokers who did not wish to quit (n=8), supported the ban ($p<0.001$). Long-term support for the smoking ban: Seventeen months after implementation of a total indoor ban on smoking at the hospital, and 2 years after the policy was announced, 82% staff smokers who completed the both surveys (n=72) maintained their original support for the ban. 16% changed their (n=14) changed from position of non-support 5 months post-implementation to support for the policy one year later.
Donchin (2004) Israel A 959-bed university hospital in Jerusalem, employing over 3,700 salaried workers and accommodating 42,580 inpatients and 201,185 outpatient visits (2001). **Before-and-after study** (3 months before smokefree implementation. 6-9 months post-implementation).	Total sample: n=368 staff (pre-policy), n=364 (post-policy) Doctors and dentists 17.1% (pre-) 13.5% (post-), nurses 27.4% 31.9%, administrators and clerks 14.9% 17.0%,technicians 28.0% 26.6%, unskilled workers 12.5% 11.0%; <35 years 23.1% (pre-) 22.5% (post-), 35– 44 years 26.9% 28.3%, 45–54 years 29.3% 27.7%, 55+ years 20.7% 21.4%; Males 36.1% (pre-) 30.2% (post-); 0-12 years of education 23.2% (pre-) 25.4% (post-), 13-15 years of education 23.5% 18.5%, 16+ years of education 53.3% 56.1%. Smoking status: current smokers 19% (pre-) 19.5% (post-), past smokers 12.5% 19.5%.	Attitudes towards smoking in the workplace (% agreement with the statement "The hospital should be completely smokefree"): There were differing response rates from smokers and non-smokers in both the pre- (45.7% and 84.5%, respectively) and post-policy surveys (60.0% and 87.0%, respectively) ($p<0.0001$) with smokers being less likely to agree with the statement, "The hospital should be completely 'smokefree'". The increase in smokers who agreed with this statement from pre- to post-policy was not statistically significant. In the pre-policy survey, controlling for personal smoking status, unskilled workers and clerks were most likely to agree with the statement, "The hospital should be completely 'smokefree'", while doctors, nurses, and technicians were least likely to (no data reported).
Erwin (1991) USA, Illinois A US Dept. of Veterans Affairs hospital in an urban centre in Illinois. Two 21-bed acute care psychiatric wards for veterans. **Before-and-after study** (3 timepoints: pre-implementation [no date given]; 1 week post implementation; 4 weeks post-implementation)	Total sample: n=29 66% (n=19) registered nurses, 17% (n=5) licensed practical nurses, 17% (n=5) nurses aides	Nursing staff support for a smokefree ward: Pre-implementation, 44% Ward A nursing staff and 61% Ward B nursing staff reported to prefer a smokefree ward. One week after smokefree implementation support for a smokefree ward was 60% Ward A and 60% Ward B, and 63% Ward A and 60% Ward B 4 weeks after smokefree implementation. (No p values calculated)
Etter (2008) Switzerland Two in-patient, adult units of	Total sample: 2003 (no ban: n=57 staff, 2006 (total ban): n=57 staff	Opinion of rules about smoking: Between 2003 (no ban) and 2006 (total ban), there was a significant increase in the percentage of staff reporting that

the Psychiatry Department of the Geneva University Hospitals: an admission and short-stay unit (16 beds) and a medium-stay unit (16 beds). **Before-and-after study** (Before implementation of smokefree – multiple timepoints: Oct 03 [pre ban], Apr 04 [2 months post-partial ban], Dec 05 [20 months post-partial ban/pre-total ban] After implementation – single timepoint: Mar-May 06 [3-5 months post-total ban])	2003 (no ban): mean age 38.8 years; 64.9% Ever smoked 100+ cigarettes, Daily smokers 26.3%, Occasional (non-daily) smokers 7.0%, Former smokers 22.8%, Never smokers 43.9%. 2006 (total ban): mean age 40.7 years; 57.9% Ever smoked 100+ cigarettes, Daily smokers 26.3%, Occasional (non-daily) smokers 7.0%, Former smokers 22.8%, Never smokers 43.9%.	"Rules about smoking at the hospital are too strict" (7.0% to 59.6%, p<0.001), there was a decrease in the percentage of staff reporting that "Rules about smoking at the hospital are adequate" (71.9% to 36.8%, p value not reported).
Fitzpatrick (2009) Ireland Acute general hospital with between 350 and 520 in-patient beds. **Cross-sectional study** (2006. Before implementation of smokefree)	Total sample: Staff: n=225	Would you agree with the introduction of a total campus-wide smoking ban indoor and outdoor? Yes: 52.4%, No: 38.2% , Don't know: 9.3% If it was introduced, would you support its implementation? Yes: 74.7%, No: 14.2%, Don't know: 11.1%
Garg (2009) England A 90 bed regional medium secure psychiatric unit in West Yorkshire. **Cross-sectional study** (After implementation of smokefree)	Total sample: n=116 60% qualified nurses (n=70), 29% unqualified nursing staff (n=34), 10% doctors/psychiatrists (n=12) 39% men (n=45), mean age 37 (SD 9.62) years, 30% (self-reported) current smokers (n=35). Current smokers: psychiatrists 16.7%, qualified nurses 34.3%, unqualified nurses 26.5%. There were no statistical differences in smoking rates between the doctors and the nurses (p=0.34) or between qualified and unqualified nursing staff (p=0.5).	Support for the smoking ban: 75% psychiatrists (9/12) and 62.5% nursing staff (qualified and unqualified) (65/104) answered yes, they support the smoking ban. There was no significant difference between the views of psychiatrists and nursing staff (p=0.53). Smokers were significantly less likely to support the ban than nonsmokers (p = 0.0001).
Haller (1996) USA, California A 16-bed locked inpatient unit in San Francisco, CA, with a 2 week mean length of stay. **Before-and-after study** (1 month pre-implementation. 1 month post-implementation)	Total sample: n=67 (pre-ban) n= 53(post-ban) Occupation: nurses 36 (pre-ban) 32 (post-ban), physicians 13 (pre-) 6 (post-), other staff 18 (pre-) 15 (post). Current smokers 5 (pre-) 4 (post-).	Pre-ban implementation, 57% staff (38/67) agreed that smoking should be entirely banned in a hospital setting, rising to 70% (37/53) agreement post-ban. Sub-group comparisons: After the ban implementation, patients were significantly more likely than staff to disagree that smoking should be entirely banned in a hospital setting (t=-3.45, df=144, p<0.001).
Hudzinski (1990) USA, Louisiana A health care institution (clinic and medical foundation) with inpatient units employing staff physicians and psychologists. **Before-and-after study** (3 timepoints: 6 months pre-implementation; 6 months post-implementation; 12 months post-implementation)	Total sample: n=1946 (pre-ban), n=1608 (6m post-ban), n=684 (12m post-ban) At 12 months follow-up: 18% physicians 82% other employee; 4% <35years, 29% 35-44 years, 27% ≥45 years; 29% male.	Support for the ban: Pre-policy, 77% of all hospital staff favoured the no-smoking policy, 75% favoured the policy 6 months after implementation, increasing to 84% of all hospital staff who favoured the policy 12 months after implementation (p<0.001).
Jones (2010) Australia Four South Australian/Northern Territory hospitals. Royal Adelaide Hospital (RAH): approximately 550 beds. Flinders Medical Centre (FMC):	Total sample: Not reported.	Area should be provided (%): ASH 92.9%; FMC 92.4%; RAH 87.7%; TQEH 92.1%. Support complete ban (%): ASH 5.5%; FMC 14.3%; RAH 19.9%; TQEH 15.0%. Not acceptable to smoke visibly (%): ASH 45.3%; FMC 67.6%; RAH 57.6%; TQEH 62.0%.

approximately 480 beds. The Queen Elizabeth Hospital (TQEH): approximately 320 beds. Alice Springs Hospital (ASH) **Cross-sectional study** (After implementation: FMC and ASH – 2004; RAH – 2005; TQEH – 2007)		
Kannegaard (2005) Denmark A Danish hospital. **Cross-sectional study** (2 timepoints before implementation of non-smoking policy: June 1999; June 2001).	Total sample: 1999: n=729, 2001: n=729 Approximately 85% of the staff are women and almost 15% were men in both studies. In 1999, 33% of the staff answered that they were smokers, while in 2001 only slightly more than 26% were smoking daily or nondaily.	Satisfaction with prohibition on smoking in the hospital compared with smoking status of responder [( ) indicates the actual number; P < 0.0005 in 1999 and 2001.] 1999 Smoker, daily: satisfied 48.5% (N = 94); not satisfied 51.5% (N = 100); total 100.0% (N = 194); Smoker, non-daily: satisfied 87.8% (N = 36); not satisfied 12.2% (N = 5); total 100.0% (N = 41); Ex-smoker: satisfied 88.2% (N = 157); not satisfied 11.8% (N = 21); total 100.0% (N = 178); Never smoked: satisfied 95.2% (N = 277); not satisfied 4.8% (N = 14); total 100.0% (N = 291); Total: satisfied 80.1% (N = 564); not satisfied 19.9% (N = 140); total 100.0% (N = 704) 2001 Smoker, daily: satisfied 21.1% (N = 43); not satisfied 70.9% (N = 105); total 100.0% (N = 148); Smoker, non-daily; satisfied 90.3% (N = 28); not satisfied 9.7% (N = 3); total 100.0% (N = 31); Ex-smoker: satisfied 87.2% (N = 164); not satisfied 12.8% (N = 24); total 100.0% (N = 188); Never smoked; satisfied 96.6% (N = 311); not satisfied 3.4% (N = 11); total 100.0% (N = 322); Total: satisfied 79.2% (N = 546); not satisfied 20.8% (N = 143); total 100.0% (N = 689).
Lewis (2011) Wales All seven hospitals of Hywel Dda Health Board, providing health care to a population of around 372 000 people in Wales. **Cross-sectional study** (After smokefree implementation)	Total sample: n=500 The mean (SD) age of the responders was 36.4 (11.9) years (range 18–70); 72% were female. Overall, 7% of responders said they were current smokers, 21% were ex-smokers and 71% reported never smoking (defined as fewer than 100 cigarettes in their lifetime).	Overall, 57% of HCPs wanted a complete ban on smoking in hospital grounds and 40% preferred a partial ban, with designated smoking areas on hospital grounds; 1% thought there should be no ban and 3% declined to answer. There was only one statistically significant difference between HCP groups with regard to the attitude to bans on hospital premises. The very small numbers supporting no ban, five in total, were combined with those supporting a partial ban. This combined group was compared with those supporting a complete ban. Doctors had the highest support for a total ban (68.5%), followed by students (59.0%), AHPs (57.8%) and nurses (52.0%). The difference between doctors and nurses was statistically signifi cant (OR 2.01, 95%CI 1.14–3.56, P = 0.01).
Matthews (2005) USA, North Carolina An 18-bed acute crisis stabilization unit where all male patients are first admitted, for up to 3 days, by which time patients are either discharged or referred to the male acute treatment unit. The unit is within Dorothea Dix State Psychiatric Hospital, which provides care to people in the south central region of	Total sample: Nursing staff n=14 (pre-ban) n=13 (post-ban)	Pre-implementation, 6 of the 14 nursing staff respondents believed banning smoking would be helpful, increasing to 13 of 13 respondents post-implementation who respondents believed the intervention had been helpful (p=0.002). [Direction of effect supports smokefree]

North Carolina. Approx. 3,000 patients (1,800 men, 1,200 women) are admitted to adult psychiatry service per year (approx. 95% involuntarily). **Before-and-after study** (1 timepoint before and 1 after smokefree implementation: dates not given)		
Parks (2009) England Addenbrooke's Hospital: a large NHS quaternary referral centre with 1,170 beds and 6,981 staff (2007/8), located in Cambridge. **Cross-sectional study** (March 20008. After smokefree implementation)	Total sample: n=704 The demographic composition of the sample was largely representative of the hospital's working population for gender, age, job profile and ethnicity. There were however differences: those aged 25 years or under were over-represented compared to those aged 26 to 45 years, men were over-represented and healthcare staff (professional and auxiliary) were under-represented. Smoking profile: 14.3% (95% CI, 12.0 – 17.1%) were smokers, 21.7% (95% CI 18.8 – 24.9%) were ex-smokers and 63.9% (95% CI 60.3 – 67.3%) had never smoked.	The hospital is right to have such a policy: non-smokers 85.3%; compliant smokers 36.8%; non-compliant smokers 34.4%
Patten (1995) USA, Minnesota A 28-bed locked adult inpatient psychiatric unit in Saint Marys Hospital, Rochester, Minnesota. **Before-and-after study** (6 months pre-implementation; 6 months post-implementation)	Total sample: (survey sample) n=137 (pre-ban) n=126 (post-ban) Smoking status: Current smokers 9.5% (pre-) 7% (post-), former smokers 36.5% (pre-) 26% (post-), never smokers 52.0% (pre-) 63% (post-), no response 2.0% (pre-) 4% (post-). Occupation: 90% (post-) work involved direct contact with patients in the psychiatric units.	Support for the policy: Pre-implementation, 49% of all staff were in favour of the smokefree policy, 44% did not support the policy and 7% were undecided or did not give a response. Post-implementation, different outcomes were measured to indicate the level of staff support for the policy. 76% of all staff agreed that they 'Would recommend that other adult psychiatric units be smokefree', 13% of all staff responded they would not. 71% of all staff responded that they would not 'Recommend that the adult psychiatric units not remain smokefree', 21% of all staff responded they would. Sub-group differences by smoking status: 78% of current staff smokers (76% former staff smokers, 81% staff never smokers) agreed that they 'Would recommend that other adult psychiatric units be smokefree', no current staff smokers (21% former staff smokers, 13% staff never smokers) responded they would not. 44% of current staff smokers (82% former staff smokers, 75% staff never smokers) responded that they would not 'Recommend that the adult psychiatric units not remain smokefree', 44% of current staff smokers (18% former staff smokers, 20% staff never smokers) responded they would.
Ratschen (2008) England English NHS Trusts providing acute and/or mental health services in inpatient facilities. **Cross-sectional study** (After implementation)	Total sample surveyed: n=186 Trusts n=132 acute Trusts (69% Trusts comprising >1 site) ; n=54 mental health settings (n=48 mental health trusts, n=6 primary healthcare trusts with providing mental health in-patient facilities) (100% Trusts comprising >1 site)	Survey data: Post-implementation of smokefree, representatives from mental health settings in NHS Trusts in England (n=54) were surveyed: 52% respondents believed that the level of policy support by staff differed among staff groups, with nurses being most frequently identified as the least supportive group (32%)
Sheffer (2009) USA Arkansas medical facilities. The number of beds at the medical facilities ranged from 0 to 791, with a mean of 132, a	Total sample: n=113 hospital CEOs/administrators	Results reported as mean (standard deviation) Support for smoking ban. Measured on an 11 point-scale (0 = do not agree at all; 11 = total agreement): As an employer: Pre-ban 8.78 (2.38); Post-ban 9.22 (1.67); As a healthcare provider: Pre-ban 9.41 (1.77); Post-ban 9.80 (0.74); As a community member: Pre-

median of 77, and a mode of 25. The majority of facilities had no psychiatric or alcohol and drug beds (n=68; 64.76%), with 27.62% (n=29) maintaining some psychiatric and alcohol and drug beds, and 7.62% (n=8) maintaining only psychiatric and/or alcohol and drug beds. The majority of medical facilities were private non-profit (56.36%), with 26.36% under corporate control, and 17.27% under city, county, state, or federal government control. **Before-and-after study** (Pre-implementation April/May 2005; post-implementation October 2006)		ban 9.10 (1.95); Post-ban 9.47 (1.26) Support anticipated/experienced from the following people. Measured on an 11 point scale (0=none at al; 11 = the most possible): Employees: pre-ban 6.86 (1.84); post-ban 7.68 (1.50); Patients: pre-ban 5.96 (2.41); post-ban 6.81 (1.88); Visitors: pre-ban 5.66 (2.26); post-ban 6.13 (2.32); Board: pre-ban 9.42 (1.14); post-ban 9.84 (0.62); Physicians: pre-ban 8.94 (1.50); post-ban 9.54 (0.71); Community: pre-ban 7.35 (1.94); post-ban 7.83 (2.10) Resistance anticipated/experienced from the following people. Measured on an 11 point scale (0=none at all; 11=the most possible): Employees: pre-ban 4.62 (2.42); post-ban 3.64 (2.35); Patients: pre-ban 4.61 (2.46); post-ban 4.13 (2.93); Visitors: pre-ban 5.41 (2.40); post-ban 4.41 (2.45); Board: pre-ban 0.40 (0.83); post-ban 0.02 (0.14); Physicians: pre-ban 1.10 (1.37); post-ban 0.73 (1.40); Community: pre-ban 2.74 (1.91); post-ban 2.00 (2.10)
Steiner (1991) USA The Connecticut Mental Health Centre Day Hospital: a short-term programme (30 days) for individuals who are making the transition from an inpatient facility to the community, or whom an 'alternative to hospitalisation' is indicated. **Before-and-after study** (1 week before and 2 weeks after a move to new smokefree premises)	Total sample: Pre-ban: 17 patients (71% smokers; average habit 1.5 packs/day [range 0.5-3]); 15 staff (20% smokers) Post-ban: 15 patients; 17 staff	Pre-move (=pre-ban): All responding staff thought the smokefree policy was a 'good' or 'great' idea, that it would assist smokers to decrease smoking and it would improve the physical environment. Post-move (=post-ban): 94% indicated that they felt the policy change had been 'good' or 'great', and 100% thought that the physical environment had improved due to the lack of smoke.
Steiner (2009) USA The Connecticut Mental Health Center: a state owned and state-operated facility with both inpatient and outpatient services, run jointly by the Connecticut Department of Mental Health and Addiction Services and Yale University. It serves individuals from the greater New Haven area who have severe and persistent mental illness, a substance use disorder, or both. **Cross-sectional study** (Pre-implementation: Jan 2007)	Total sample: n=175 Most survey respondents were women (N=124, 71%) and Caucasian (N=117, 67%), and the mean±SD age of respondents was 42.5±11.8 years. Most respondents had never smoked (N=107, 61%); 14% (N=25) defined themselves as current smokers, and 25% (N=43) defined themselves as former smokers.	Respondents differed by smoking status in their agreement about whether the entire mental health center campus should become smoke free ($p<.05$). In addition, the overall regression model was significant ($\chi2=14.9$, df=6, $p<.05$). When the analysis controlled for age, gender, ethnicity, and job category, smoking status continued to predict attitudes about a smokefree center. In general, compared with former smokers and current smokers, a larger proportion of those who had never smoked agreed that the mental health center should be smoke free.
Ullén (2002) Sweden Karolinska Hopsital, Sweden. A large University Hospital dedicated to specialist medical care and clinical research. 1,000 beds, 6,000 staff. **Cross-sectional study** (3 separate cross-sectional studies after implementation	Total sample: Heads of departments n=41; Employees n=517 [84% female]; Labour managers n=17	Heads of Department reported a third of their staff were satisfied with the smoking restrictions, and the remaining two thirds were of a mixed positive/negative opinion. Employee survey: 62% of employees had a positive attitude towards the smoking restrictions. 28% had mixed attitudes. 7% were negative towards the restrictions. Approximately 30% said they had changed their opinion to the ban in a positive

of smokefree: Dec 1992; March 1993; March 1995)		direction.
Vardavas (2009) Greece A large regional university hospital which provides primary and secondary care to the population of Heraklion and tertiary care to the population of Crete and the nearby islands. **Cross-sectional study** (After implementation of smokefree)	Total sample: n=100 staff (n=55 medical research staff/doctors; n=45 nursing staff) 33.0% males; mean age 39.2 SD 7.4 years; 45.0% smokers, 55.0% ex- and non-smokers; mean 8.0 SD 9.0 years of smoking; 8.9% 1-9 cigarettes/day, 68.9% 10-20 cigarettes/day, 22.2% >20 cigarettes/day; mean 8 SD 11 cigarettes/day.	Approval or disapproval of smokefree hospitals: 66% (n=66) of total staff approved of smokefree hospitals, 70.9% (n=39) of all medical/research staff approved of smokefree hospitals, 60.0% (n=27) of all nursing staff approved of smokefree hospitals. 46.7% (n=21) of total staff smokers approved of smokefree hospitals, 52.6% (n=10) of all medical/research staff smokers approved of smokefree hospitals, 42.3% (n=11) of all nursing staff smokers approved of smokefree hospitals. 81.8% (n=45) of total staff non-smokers (non- and ex-smokers) approved of smokefree hospitals, 80.6% (n=29) of all medical/research staff non-smokers approved of smokefree hospitals, 84.2% (n=16) of all nursing staff non-smokers approved of smokefree hospitals.
Voci (2010) Canada Centre for Addiction and Mental Health: 557 beds; provides care to over 20,000 patients annually through approximately 28 inpatient units and over 100 outpatient clinics. CAMH is governed by Ontario's provincial health care system and is a fully affiliated teaching hospital of the University of Toronto. **Cross-sectional study** (2 cross sectional studies after smokefree implementation: 2-7 months post implementation [Nov-April 2006]; 31-33 months post-implementation [April-June 2008])	Total sample: 2005-2006: n=430; 2008: n=400 2005-2006: mean age 45.7 (SD 11.1); 79.2% female 2008: mean age 44.9 (SD 11.2); 77.3% female. (Further demographic information provided.)	2005-2006 survey How strongly did you support the smokefree policy before it was implemented? n=430: 64.0% definitely support; 18.6% support; 9.3% neutral; 5.6% do not support; 2.6% definitely do not support How strongly do you support the smokefree policy currently? n=430: 72.6% definitely support; 16.5% support; 4.4% neutral; 2.3% do not support; 4.2% definitely do not support. 2008 survey How strongly do you support the smokefree policy currently? n=386: 78.2% definitely support; 11.9% support; 5.4% neutral; 2.1% do not support; 2.3% definitely do not support Staff who were current smokers were more likely to recall having not supported the policy before implementation and were more likely to be unsupportive at both time points post-implementation.
Wheeler (2007) USA, Arkansas Two sites: 1) Arkansas's university hospital and academic medical center and 2) a smaller, private children's hospital that uses the university's faculty and residents for its medical staff. Before-and-after study (Site 1: before implementation [April 2004]; after implementation [May 2005]). **Cross-sectional study** (Site 2: 2 months after employee only ban [4 months before implementation of total smoking ban])	Total sample: Questionnaire site 1 (staff): n=842 (pre-implementation), n=912 (post-implementation) Occupation distribution changed significantly due to a change in nurse respondents from 19% (pre-) to 11% (post-) ($p<0.0001$) and education distribution changed significantly due to decreases in 'high school or less' and 'college graduate' and an increases in 'professional or post-college education' ($p=0.015$). Gender ($p=0.8964$), age and race distributions did not change significantly between measures.	Support for the policy: Between April 2004 (pre-implementation) and May 2005 (post-implementation), there was a significant increase in staff support for the ban (83.3% to 89.8%, $p<0.001$). Results in favour of smokefree. (The researchers were "concerned that underrepresentation of smokers, who may have chosen not to return the survey, might have influenced our results" (p.751) and reweighted the data (more weight to smokers to bring the prevalence in Apr 04 and May 05 up to 15% and reduced weights to non-smokers). On reanalysis of the 'support for the policy' variable, percentages changed proportionally in both years, but only by 2-3% without any effect on significance testing. The results were still in favour of smokefree.)
Wye (2010) Australia A large psychiatric inpatient hospital in the state of New South Wales. The facility had approximately 2000 patient discharges per annum, consisting of 80 beds in six units: a psychiatric emergency	Total sample: n=183: clinical staff 73; non-clinical staff 110 66% female; 44% under 35 years; 21% 36-45 years; 35% 45+ years; 21% current smokers; 26% former smokers; 52% never smokers	Do you support the statement that smoking should be totally banned throughout the Area's mental health services?: 7% strongly unsupportive; 14% unsupportive; 12% no view either way; 33% supportive; 34% strongly supportive. Do you agree with the statement that smoking should be totally banned on the unit? (clinical staff only): 7% strongly disagree; 19% disagree; 19%

centre, an intensive care unit, two general acute units, a dual diagnoses (concurrent mental health and substance use) unit, and an aged care unit. **Cross-sectional study** (Before smokefree implementation)		unsure; 22% agree; 32% strongly agree.

Of the nine studies that assessed staff support for smokefree policy by staff smoking status, all found that non-smokers were more supportive of smokefree policy than smokers (**Bloor 2006 [England, MHS, SCSS+]**; **Daughton 1992 [USA, BHS, RCSS-]; Donchin 2004 [Israel, BHS, BAS+]; Garg 2009 [England, MHS, SCSS+]; Kannegaard 2005 [Denmark, BHS, RCSS++]; Parks 2009 [England, BHS, SCSS+]; Steiner 2009 [USA, MHS, SCSS+]; Vardavas 2009 [Greece, BHS, SCSS-]; Voci 2010 [Canada, MHS, RCSS++]**). Five of these studies reported that the between-group differences were significant to p<0.05 (**Donchin 2004 [Israel, BHS, BAS+]; Garg 2009 [England, MHS, SCSS+]; Parks 2009 [England, BHS, SCSS+]; Steiner 2009 [USA, MHS, SCSS+]; Voci 2010 [Canada, MHS, RCSS++]**), one reported that the finding was not significant (**Vardavas 2009 [Greece, BHS, SCSS-]**), and the others did not report levels of significance. These studies covered both mental health secondary care settings (**Bloor 2006 [England, MHS, SCSS+]**; **Garg 2009 [England, MHS, SCSS+]**; **Steiner 2009 [USA, MHS, SCSS+]; Voci 2010 [Canada, MHS, RCSS++]**) and broader secondary care settings (**Daughton 1992 [USA, BHS, RCSS-]; Donchin 2004 [Israel, BHS, BAS+]; Parks 2009 [England, BHS, SCSS+]; Vardavas 2009 [Greece, BHS, SCSS-]**). One study reported a sub-group difference by level of smoking. **Daughton (1992 [USA, BHS, RCSS-])** reported that heavy smoking staff (≥30 cigs/day) were significantly less supportive of smokefree policy than light smoking staff (<10 cigs/day): only 27% of heavy smokers were supportive, compared to 64% of light smokers (p<0.05).

Of the seven studies that assessed staff support for smokefree policy before and after policy implementation, the majority reported that support increased after implementation compared to support before implementation (**Cormac 2010 [England, MHS, BAS+]; Erwin 1991 [USA, MHS, BAS-]; Haller 1996 [USA, MHS, BAS+]; Matthews 2005 [USA, MHS, BAS-]; Sheffer 2009 [USA, BHS, BAS+]; Voci 2010 [Canada, MHS, RCSS++]**; **Wheeler 2007 [USA, BHS, MMS-]**). Four of these studies reported that the findings were significant to p<0.05 (**Matthews 2005 [USA, MHS, BAS-]; Sheffer 2009 [USA, BHS, BAS+]; Voci 2010 [Canada, MHS, RCSS++]**; **Wheeler 2007 [USA, BHS, MMS-]**), while the others did not report significance levels. These studies covered both mental health and broader secondary care settings.

One study also reported that staff support for smokefree policy increased significantly with time after policy implementation. **Hudzinski et al (1990 [USA, BHS, BAS+])** reported that 75% of all staff at a US healthcare institution supported the policy 6 months after implementation, increasing to 84% of staff supporting the policy 12 months after implementation (p<0.05).

In contrast, one study showed a decline in support. **Steiner et al (1991 [USA, MHS, BAS+])** reported that before implementation of a smokefree buildings policy in US mental health facility, all staff (n=17) thought the policy was a 'good' or 'great' idea. This figure dropped marginally to 94% 3 weeks after implementation with one member of staff disagreeing.

Six studies assessed support for smokefree policy by staff occupation (**Donchin 2004 [Israel, BHS, BAS+]; Garg 2009 [England, MHS, SCSS+]; Lewis 2011 [Wales, BHS, SCSS+]; Ratschen 2008 [England, BHS, MHS, MMS+]**; **Vardavas 2009 [Greece, BHS, SCSS-]; Voci 2010 [Canada, MHS, RCSS++]**). These studies covered both mental health settings and other secondary care settings. Two studies reported that nurses were significantly less supportive of smokefree policy than other staff (**Lewis 2011**

[Wales, BHS, SCSS+]; Voci 2010 [Canada, MHS, RCSS++]). **Lewis et al (2011 [Wales, BHS, SCSS+]**) reported that 69% of doctors supported a total smoking ban at a Welsh NHS health board, while only 52% of nurses supported the ban (p=0.01). **Voci et al (2010 [Canada, MHS, RCSS++**]) reported that nurses in a Canadian psychiatric hospital were significantly less supportive of smokefree policy before implementation (recalled 2-7 months after policy implementation) (nurses versus other staff OR 2.99, p=0.27), and at 2-7 months post implemenation (OR 3.33, p=0.27). The difference was not significant at 31-33 months post-implementation. Two additional studies reported that nurses were less supportive of smokefree policy than other staff, but the findings were not significant (**Garg 2009 [England, MHS, SCSS+]; Vardavas 2009 [Greece, BHS, SCSS-]**). **Garg et al (2009 [England, MHS, SCSS+])** reported that 75% of psychiatrists and 63% nursing staff at an English psychiatric hospital supported an indoor smoking ban (p=0.53). Vardavas et al (**2009 [Greece, BHS, SCSS -]**) reported that 71% of medical and research staff, and 60% of nursing staff at a Greek university hospital supported smokefree policy (p>0.05). **Ratschen (2008 [England, BHS, MHS, MMS+])** reported that nurses were most frequently cited as the least supportive staff group by the representatives of the mental health settings responding to their survey of NHS acute and mental health Trusts. **Donchin (2004 [Israel, BHS, BAS+])** reported that, controlling for smoking status, unskilled workers were more likely to support smokefree policy than doctors, nurses and technicians (exact figures not reported). Overall, these studies suggest that nurses are less supportive of smokefree policy than other staff.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Level of staff support for smokefree policy

Evidence statements:

1.1 Facilitator: exposure to the policy brings about a positive shift in levels of staff support. Eight studies (one UK, seven non-UK), five relating to mental health and three to broader secondary care settings found that staff support for smokefree policy increased post-implementation (**Cormac 2010 [England, MHS, BAS+]; Erwin 1991 [USA, MHS, BAS-]; Haller 1996 [USA, MHS, BAS+]; Matthews 2005 [USA, MHS, BAS-]; Sheffer 2009 [USA, BHS, BAS+]; Voci 2010 [Canada, MHS, RCSS++]**; **Wheeler 2007 [USA, BHS, MMS-]; Hudzinski 1990 [USA, BHS, BAS+]**). One study conducted in a US mental health setting found that staff support declined post-implementation (**Steiner 1991 [USA, MHS, BAS+]**).

1.2 Barrier: differences in level of support by smoking status and occupational group. Nine studies (three UK, six non-UK), four conducted in mental health settings and five in broader secondary care settings, found that staff who smoked were less likely than staff who were non-smokers to support smokefree policy (**Bloor 2006 [England, MHS, SCSS+]**; **Daughton 1992 [USA, BHS, RCSS-]; Donchin 2004 [Israel, BHS, BAS+]; Garg 2009 [England, MHS, SCSS+]; Kannegaard 2005 [Denmark, BHS, RCSS++]; Parks 2009 [England, BHS, SCSS+]; Steiner 2009 [USA, MHS, SCSS+]; Vardavas 2009 [Greece, BHS, SCSS-]; Voci 2010 [Canada, MHS, RCSS++]**). Five studies (three UK, two non-UK), two conducted in mental health settings and three in broader secondary care settings found that nurses were less likely to support smokefree policy than other healthcare workers (**Garg 2009 [England, MHS, SCSS+]; Lewis 2011 [Wales, BHS, SCSS+]; Vardavas 2009 [Greece, BHS, SCSS-]; Voci 2010 [Canada, MHS, RCSS++]**; **Ratschen 2008 [England, BHS, MHS, MMS+])**.

Six of the 19 studies reported were conducted in the UK **(Cormac 2010 [England, MHS, BAS+];**

Bloor 2006 [England, MHS, SCSS+]; **Garg 2009 [England, MHS, SCSS+]; Parks 2009 [England, BHS, SCSS+]; Lewis 2011 [Wales, BHS, SCSS+]; Ratschen 2008 [England, BHS, MHS, MMS+]**).

1.2 Level of patient support for smokefree policy

Qualitative findings

No qualitative evidence was identified relating to this theme

Quantitative findings

Six quantitative studies assessed patient support for smokefree (**Cormac 2010 [England, MHS, BAS+]**; **Etter 2008 [Switzerland, MHS, BAS+]; Hudzinski 1990 [USA, BHS, BAS+]**; **Rosen 1995 [USA, BHS, SCSS+]; Stillman 1995 [USA, BHS, SCSS+]; Steiner 1991 [USA, MHS, BAS+]**). These studies are summarised in **Table 3**.

Table 3: Data summaries for studies measuring patient support for smokefree

Study details **Country** **Where** **Study design** **(when measured)**	**Sample** **Total sample** **Sample characteristics**	**Patient support for smokefree**
Cormac (2010) England A high secure, long-stay psychiatric hospital for patients with complex mental health disorders who are a grave and immediate danger to the public or themselves (the majority have committed serious offences). **Before-and-after study** (Feb 2007: before smokefree implementation. July 2007: after smokefree implementation)	Total sample: Patients n=175 (pre-ban) n=115 (post-ban) Pre-ban (89% male, 70% smokers pre-ban); post-ban (85% male, 87% smokers pre-ban).	In favour of the ban: patients pre-ban 40/175 (22.9%) patients post-ban 29/115 (25.2%). Changed in favour of smokefree. No further statistical information is available.
Etter (2008) Switzerland Two in-patient, adult units of the Psychiatry Department of the Geneva University Hospitals: an admission and short-stay unit (16 beds) and a medium-stay unit (16 beds). **Before-and-after study** (Before implementation of smokefree – multiple timepoints: Oct 03 [pre ban], Apr 04 [2 months post-partial ban], Dec 05 [20 months post-partial ban/pre-total ban] After implementation – single timepoint: Mar-May 06 [3-5 months post-total ban])	Total sample: 2003 (no ban): n=49 patients. 2006 (total ban): n=77 patients Patients 2003 (no ban) 91.8% Ever smoked 100+ cigarettes, Daily smokers 73.5%, Occasional (non-daily) smokers 6.1%, Former smokers 12.2%, Never smokers 8.2%, 2006 (total ban) 81.6% Ever smoked 100+ cigarettes, Daily smokers 65.8%, Occasional (non-daily) smokers 2.6%, Former smokers 15.8%, Never smokers 15.8%; Patients 2003 (no ban) mean age 39.9 years. 2006 (total ban) mean age 41.0 years; Patients 2003 (no ban) 59.2% men. 2006 (total ban) 60.0% men.	Opinion of rules about smoking: Between 2003 (no ban) and 2006 (total ban), there was a significant increase in the percentage of patients reporting that "Rules about smoking at the hospital are too strict" (12.2% to 49.4%, p<0.001), there was a decrease in the percentage of patients reporting that "Rules about smoking at the hospital are adequate" (73.5% to 46.8%, p value not given).
Hudzinski (1990) USA, Louisiana A health care institution (clinic and medical foundation) with inpatient units employing staff physicians and psychologists. Before-and-after study (3 timepoints: 6 months pre-implementation; 6 months post-implementation; 12 months post-implementation)	Total sample: n=607 (pre-ban), n=397 (6m post-ban), n=600 (12m post-ban)	Support for the ban: Pre-policy, 82% of hospital patients surveyed favoured the no-smoking policy, 93% favoured the policy 6 months after implementation, an 80% favoured the policy 12 months after implementation (p<0.001).
Rosen (1995) USA, Massachusetts A 379-bed tertiary teaching hospital	Total sample: n=329 Mean hospitalisations in past year 2.2	Satisfaction with the non-smoking policy: When surveyed 1 week after being discharged from hospital, 75% of

Cross-sectional study (May-July 1992: 7-9 months post-implementation)	(SD=1.6); mean cigarettes per day 24 (SD=15), mean years smoked 27 (SD=14), mean smokers in house 0.8 (SD=0.9); mean age 58 (SD=16) years; female 48%; white 86%; college/higher education 37%; professional/manager 37%; employed 25%.	all patients were satisfied with the non-smoking policy at the hospital, 11% were dissatisfied and 14% were not sure. Sub-group differences: current smokers had the least satisfaction with the policy (55%) and the most dissatisfaction (34%), compared with former smokers (85% satisfied, 3% dissatisfied) and never smokers (72% satisfied, 8% dissatisfied) (Chi-square=56.4, df=12, p<0.0001).
Stillman (1995) USA, Maryland A 1000 bed urban teaching hospital **Cross-sectional study** (1990-1992: 0-2 years post-implementation)	Total sample: n=504 inpatients (who were recruited for smoking cessation counselling) Mean age=50.2 years; 51% male; 28% African American, "most of the rest were white"; 63% high school graduates; 51% had a cardiac diagnosis; mean length of stay=8.3 days. All study participants were smokers.	Agreement with the policy: 76.8% patients surveyed at admission expressed agreement with the smokefree policy. There were no differences in agreement with the policy based on gender, age or race of the patient. Sub-group differences: Patients who remained abstinent during hospitalisation (self report to not smoking even one cigarette) were significantly more likely to have stated agreement with the policy than patients who smoked during hospitalisation (self-report to either leaving the hospital to smoke or being non-compliant with the policy and smoking inside the hospital building) (82% versus 62.5%, p<0.001).
Steiner (1991) USA The Connecticut Mental Health Centre Day Hospital: a short-term programme (30 days) for individuals who are making the transition from an inpatient facility to the community, or whom an 'alternative to hospitalisation' is indicated. **Before-and-after study** (1 week before and 2 weeks after a move to new smokefree premises)	Total sample: Pre-ban: 17 patients; 15 staff ; Post-ban: 15 patients; 17 staff Patients: 71% smokers; average habit 1.5 packs/day [range 0.5-3]); staff: 20% smokers	Pre-move: Patient opinion was evenly divided on whether the plan was a good or bad idea, and 53% thought it would assist smokers to decrease smoking. 71% of patients thought the physical environment would improve. Three patients expressed angry sentiments. Post-move: 67% of responders (which included all the non-smokers) thought that the policy change had been 'good' or 'great'. 86% of respondents felt that there had been an improvement in the physical environment.

Cormac et al (2010 [England, MHS, BAS+]) assessed patient support for smokefree policy in a psychiatric hospital 1-2 months before and 4 months after policy implementation, and reported that patient support increased after implementation compared to support before implementation. **Hudzinski et al (1990 [USA, BHS, BAS+])** reported that patient support for smokefree policy was higher 6 months after implementation than it was 6 months before implementation, but lower 12 months after implementation than it had been pre-implementation.

Rosen et al (1995 [USA, BHS, SCSS +]) reported that smokers were significantly less satisfied with the indoor smokefree policy at a US teaching hospital than non-smokers. Current smokers had the least satisfaction with the policy (55%) and the most dissatisfaction (34%) compared with ormer smokers (85% satisfied, 3% dissatisfied) and never smokers (72% satisfied, 8% dissatisfied) (p<0.05). Smokers were also significantly more likely to prefer fewer or no restrictions on smoking than non-smokers. When surveyed 1 week after being discharged from hospital, 14% of all patients said that they would prefer tigher restrictions on smoking at the hospital. Current smokers were most likely to prefer

fewer or no restrictions compared with former smokers and never smokers (15%, 3% and 4% respectively, p<0.05).

Level of patient support for smokefree policy

Evidence statements:

1.3 **Inconclusive: exposure to the policy brings about a positive shift in levels of patient support.** One UK study conducted in a mental health setting found that patient support for smokefree policy increased post-implementation (**Cormac 2010 [England, MHS, BAS+]**), while another conducted in a broad secondary setting in the USA found that patient support had increased in the short-term (i.e. at 6 months post implementation) but then decreased in the longer-term (i.e. by 12 months support had fallen below pre-implementation levels) (**Hudzinski 1990 [USA, BHS, BAS+]**).

1.4 **Barrier: differences in level of support by patient smoking status.** One US study conducted in a broad secondary care setting found that patients who smoked were significantly less likely than patients who were non-smokers to support a smokefree policy (**Rosen 1995 [USA, BHS, SCSS+])**.

Only one of the three studies reported was conducted in the UK (**Cormac 2010 [England, MHS, BAS+]**).

1.3 Preferences for type of smokefree policy

Qualitative findings

No qualitative evidence was identified relating to this theme.

Quantitative findings

Four quantitative studies considered staff preferences for a range of smokefree polices i.e. indoor only ban, indoor ban plus designated indoor areas (partial indoor ban), indoor ban plus designated outdoor smoking areas (partial outdoor ban), or indoor ban plus smokefree grounds (total ban) (**Jones 2010 [Australia, BHS, SCSS+]**; **Lewis 2011 [Wales, BHS, SCSS+]; Praveen 2009 [England, MHS, SCSS+]**; **Vardavas 2009 [Greece, BHS, SCSS-]**).

In a survey to assess staff attitudes towards smoking on hospital grounds at a general hospital with an indoor ban already in place, **Jones et al (2010 [Australia, BHS, SCSS+])** reported that the minority of staff (<20%) responding to their surveys supported a total ban, and the majority (>87%) believed that smoking areas should be provided. **Lewis et al (2011 [Wales, BHS, SCSS+])** reported that 57% staff who responded to their survey at a hospital with a total ban in place preferred the total smoking ban, while 40% were in favour of a partial outdoor ban with designated smoking areas on hospital grounds. **Vardavas et al (2009 [Greece, BHS, SCSS -])** reported that the majority (>93%) of staff respondents to their survey (both smokers and non-smokers), at a hospital with an indoor smoking ban preferred a partial ban with designated smoking and non-smoking areas inside the hospital, to a total indoor ban.

Praveen et al (2009 [England, MHS, SCSS+]) reported that non-smoking staff at three in-patient mental health units with impending indoor smoking bans, were more supportive of a total ban, including banning smoking in outdoor areas, than staff who smoked. The study also found that

managers were more supportive of a total ban (29% supportive) than doctors (20% supportive) or nurses (20% supportive). No statistical analysis was reported.

One quantitative study (**Smith 2008 [England, MHS, SCSS+]**) considered patient preferences for smokefree indoor polices in mental health facilities with a partial indoor ban and impending full indoor ban. The authors reported that 71% of patients supported a smokefree policy with designated indoor smoking areas, while only 14% supported an indoor ban.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Preferences for type of smokefree policy

Evidence statements:

1.5 **Facilitator: greater support for smoking bans where designated smoking areas are provided.** One Australian study found a strong preference amongst staff for a partial outdoor ban incorporating designated smoking areas on hospital grounds (**Jones 2010 [Australia, BHS, SCSS+]**) while two studies (one UK, one non-UK), one conducted with staff and the other with patients found a strong preference for a smokefree indoor policy incorporating designated indoor smoking areas to a total ban on smoking indoors (**Vardavas 2009 [Greece, BHS, SCSS-]; Smith 2008 [England, MHS, SCSS+]**). One UK study conducted in a broad secondary care setting found a marginal preference amongst staff for a total ban on hospital grounds to a partial outdoor ban (**Lewis 2011 [Wales, BHS, SCSS+])**. Of the studies (two UK, one non-UK) supporting the provision of designated smoking areas, one was conducted in a mental health setting (**Smith 2008 [England, MHS, SCSS+]**) and two were conducted in broader secondary care settings (**Jones 2010 [Australia, BHS, SCSS+]**; **Lewis 2011 [Wales, BHS, SCSS+]**).

1.6 **Barrier: differences in level of support for a total ban on smoking by smoking status and occupational group.** One UK study conducted in a mental health setting found staff who were smokers to be less likely to support a total ban on smoking than staff who were non-smokers, and healthcare and clinical staff to be less likely to support a total ban than managers **(Praveen 2009 [England, MHS, SCSS+]**).

Of the five studies reported the majority, three, were conducted in the UK (**Smith 2008 [England, MHS, SCSS+]; Lewis 2011 [Wales, BHS, SCSS+]; Praveen 2009 [England, MHS, SCSS+]**) and one other was judged to have similar applicability to the UK (**Jones 2010 [Australia, BHS, SCSS+]**).

Q2: Factors affecting acceptance of smokefree policy

Views on factors affecting acceptance of smokefree policy were grouped under five themes: attitude to smoking as a 'rights' issue; organisational factors associated with the adoption of smokefree policy; policing and enforcement of smokefree policy; cessation support in relation to smokefree policy; and patient groups requiring special consideration when devising smokefree policy. Brief summaries of the studies used to answer this research question are given in **Figure 3**.

Figure 3: Question 2 study summaries

Qualitative evidence only

Campion 2008 [Australia, MHS, QS+] reported on the introduction, trial and termination of a smokefree policy in an acute mental health inpatient unit. Individual and group interviews were carried out with 6 key informants, and analysis of documentation related to implementation of the smokefree policy was carried out.

Drach 2012 [USA, MHS, QS-] assessed tobacco-related policies and procedures at all state-funded, community-based residential mental health and substance abuse treatment facilities in Oregon before implementation of a state-wide smokefree policy. Telephone interviews were carried out with administrators from 163 facilities, 111 of which provided additional open-ended comments about tobacco-related policies.
HUG 2007 [Scotland, MHS, QS-] reported on the findings of 13 branch discussion meetings of a network of people who use or have used mental health services in the Scottish Highlands: Highland Users Group (HUG). The meetings involved 85 people, and explored participants' views on the possibility of psychiatric hospitals becoming smokefree.

Jessup 2007 [USA, MHS, QS++] explored the implementation of a smokefree policy requiring total abstinence from tobacco at a residential drug abuse treatment facility for pregnant and post-partum women. All staff were invited to take part in an interview. Those who took part in interviews (n=8) also took part in a focus group discussion.

Johnson 2010 [Canada, MHS, QS++] carried out a discourse analysis of healthcare providers' engagement in tobacco control in community mental health settings. Ninety-one healthcare providers (42 professionals and 49 paraprofessionals) across 6 study locations including 2 mental health housing units participated in open-ended interviews in which they described their role in tobacco control.

Karan 1993 [USA, MHS, CS-] report on the introduction and subsequent termination of a smokefree policy, requiring patient tobacco abstinence, at an inpatient substance abuse inpatient unit for patients with late stage addictions requiring intensive support.

Kotz 1993 [USA, MHS, CS-] reported on the implementation of an indoor smoking ban at an independent/private 20 bed chemical dependency unit in a 1000 bed tertiary care hospital.

McNeil 2007 (case studies, interviews, observation, Scotland +) explored the move towards mental health settings becoming smokefree in Scotland. The study consisted of interviews with professionals involved in managing, delivering or supporting mental health services in Scotland (n=11). In addition, observational visits were carried out to 4 UK NHS sites/hospitals, and the information gathered from these was presented as case studies.

Mental Health Foundation 2009 [England, MHS, SCSS+] explored the impact of smokefree legislation in English psychiatric units. A questionnaire survey was circulated around UK psychiatric units 5 months after the legislation came into force, and responses were received from 100 English NHS units and 9 independent sector units. Open-ended responses to the questionnaire were reported.

Parle 2004 [Canada, MHS, CS-] report on the implementation of a total smoking ban, including grounds, at a 291 bed psychiatric hospital spread over 225 acres incorporating a large maximum secure unit.

Pritchard 2008 [England, MHS, QS++] evaluated the impact of a smokefree policy covering buildings and grounds within a mental health Trust. Purposive sampling was used to recruit 19 participants from a range of settings involved in implementation to take part in short interviews, including patient advocates, nursing staff and consultants.

Ratschen 2009a [England, MHS, QS++] explored the implementation of a smokefree policy in 2 adult inpatient mental health wards in an acute mental health Trust. Interviews were carried out with a stratified purposive sample of 16 medical and non-medical staff.

Ratschen 2010 [England, MHS, QS++] explored inpatients' experience of smokefree policy in 2 acute adult mental health wards, and one 10-bed intensive care unit. Interviews were carried out with 15 inpatient smokers.

Seymour 2000 [England, BHS, CS-] present a series of case studies from 6 NHS Trusts, selected because each offered a different perspective and approach to tobacco control. Case study data were gathered through questionnaires, and supplementary interviews were conducted with Trust representatives.

Schultz 2011 [Canada, BHS, QS++] carried out a mixed methods ethnographic study to explore the consequences of smokefree policy in two acute care teaching hospitals that had implemented smokefree property policies 3 years previously. A total of 82 inpatients, 9 key policy makers and 14 support staff were interviewed. Sixteen focus groups were held with healthcare providers and ward staff (n=81). In addition, researchers carried out 6 hour observations at each site.

Tillgren 1998 [Sweden, BHS, QS-] evaluated the implementation of an indoor smoking ban in a large university hospital. Four years after implementation of the ban, interviews were carried out with non-healthcare staff at the hospital: gardeners (n=5), cleaners (n=5), and hosts/hostesses (n=5).

Wareing 2012 [England, MHS, QS+] explored the implementation of smokefree legislation in English mental health services. Observational visits to 28 units were carried out. These were drawn from a cross section of responses to a questionnaire on compliance that had been distributed to a broad range of mental health facilities across England. The selected units represented those who reported good practice, those who reported problems, and some who had not responded to the compliance questionnaire.

Qualitative and quantitative evidence

Arack 2009 [England, BHS, SCSS-] conducted a survey to explore the effect of a complete smoking ban at an NHS Trust, focusing on staff attitudes, staff compliance, and staff smoking behaviour. The survey took place 17 months after implementation of the ban. A total of 160 staff were recruited to take part in the survey through opportunity sampling. Outcome measures were support for smoking ban, and opinions about enforcement of the ban. Thematic analysis was used to identify the main themes emerging from responses to the survey's open-ended questions.

Fitzpatrick 2009 [Ireland, BHS, MMS+] carried out a survey of staff and patient attitudes at an acute general hospital with an indoor ban in place, and plans to transition to a complete campus-wide ban. A total of 295 patients and 225 staff took part in the study. The relevant attitudinal result was support for the planned introduction of a campus-wide ban. In addition, short 5-15 minute attitudinal interviews were conducted with smoking patients (n=28) and staff (n=30).

Sheffer 2009 [USA, BHS, BAS+] explored the attitudes and beliefs of hospital CEOs (Chief Executive Officers)/administrators in one US State towards smokefree legislation 6 months before (n=84) and 1 year after (n=68) legislation became effective. The surveys assessed support for the legislation, support for and resistance to smokefree anticipated/experienced from stakeholders (staff, patients, visitors etc.), and views about the challenges of implementing the legislation. The surveys included a number of open-ended questions.

Ratschen 2008 [England, BHS, MHS, MMS+] explored the impact and challenges of implementation of smokefree policy in NHS acute and mental health Trusts. Questionnaire based surveys were sent to all NHS acute and mental health Trusts, of which representatives from 186 Trusts completed questionnaires (72 mental health trusts and 114 Acute Trusts). At the time of the survey, the majority of Trusts had implemented smokefree policies. Relevant attitudinal results included: views about experience of staff support; views about the effect of smokefree on patient mental health (mental health settings only); beliefs about the effect of smokefree on patient medication needs (mental health settings only); views about the effect of smokefree policies on the staff-patient relationship; views about enforcement and compliance. Questionnaires were supplemented with semi-structured telephone interviews with 22 respondents and direct observation at a sample of 15 Trusts (22 different sites).

Wheeler 2007 [USA, BHS, MMS-] evaluated the impact of a total smoking ban at a university hospital (site 1), and an employee smoking ban at a private children's hospital on the hospital campus (site 2). Staff were surveyed at site 1 three months before implementation of the ban (n=842) and 10 months after implementation (n=912). Staff were surveyed at site 2 two months after implementation of the staff smoking ban (n=183). The surveys assessed: support for policy; belief that the policy would make/made the site healthier and safer; belief that the policy would set/set a good example for patients. In addition, focus group discussions were conducted with supervisors (n=7) and security personnel (n=4), and key informant interviews were carried out with hospital administrators (n=8) at site 1 after implementation of the ban.

Quantitative evidence only

Baile 1991 [USA, BHS, SCSS+] investigated the impact of a complete smoking ban on the employees of a cancer treatment facility four months after implementation of the ban. A total of 266 non-smoking employees were recruited through staff meetings to complete a questionnaire. The key outcome measure was attitudes towards employer's right to ban smoking.

Bloor 2006 [England, MHS, SCSS+] conducted a questionnaire survey to investigate the impact of a smokefree policy in a newly opened English mental health hospital on the smoking behaviour and attitudes of nursing staff. A total of 92 nurses

completed the questionnaire. Relevant outcome measures were support for ban, beliefs about right to smoke, and attitudes towards enforcement of the policy.

Haller 1996 [USA, MHS, BAS+] studied the effects of a complete smoking ban in a locked psychiatric unit. Staff and patients were surveyed 1 month before implementation (staff n=67; patients n=21). Staff were also surveyed 1 month after implementation (n=53), and patients were surveyed 2-4 months after implementation (n=93). The survey measured attitudes towards the ban, and its perceived impact on patients and the ward.

Hill 2007 [England, MHS, SCSS++] investigated the attitudes of patients (n=38) and staff (n=39) on an in-patient drug and alcohol dependence treatment unit towards a proposed indoor smoking ban. The relevant attitudinal results were beliefs about the willingness of patients to accept treatment in a smokefree facility, beliefs about the difficulty of treatment in a smokefree environment, and beliefs about the success of treatment in a smokefree environment.

Matthews 2005 [USA, MHS, B&A-] evaluated the implementation of a smoking ban on an acute psychiatric unit for men. Staff were surveyed before (n=14) and after implementation of the ban (n=13). The surveys covered beliefs about benefits of the ban, beliefs about the ethics of the ban, and views about the problems anticipated/experienced as a result of the ban.

Ratschen 2009b [UK, MHS, SCSS++] explored staff attitudes to smokefree policy in 25 inpatient mental health units of an NHS Mental Health Trust with a smokefree policy in place. A total of 459 staff completed a questionnaire survey designed to assess beliefs about the importance of addressing smoking in mental health settings, views about compliance and enforcement, and beliefs about smoking and mental health.

Shipley 2008 [England, BHS, SCSS+] explored staff views about enforcement of smokefree policy at a general hospital with a smokefree policy in place. A total of 85 staff were recruited through convenience sampling. Staff were asked whether they would challenge patients, other staff members or visitors for smoking on the hospital sites, and the study explored the reasons given by staff who said they would not do so.

Voci 2010 [Canada, MHS, RCSS++] explored staff attitudes towards and experiences of implementation of an indoor and partial-outdoor smoking ban at a centre for mental health and addiction at two time points after policy implementation: 2-7 months after implementation (n=430); and 31-33 months after implementation (n=400). The surveys assessed: support for the policy; beliefs about the beneficial effects of smokefree policy on the hospital environment; views about the right to smoke/right to be protected from second hand smoke; beliefs about the effect of smokefree policy on patient mental and physical health; beliefs about the effect of smokefree policy on patient aggresion and patient management; beliefs about the effects of the policy on patient medication needs; beliefs about the effect of the policy on safety; and beliefs about the effect of the policy on patient retention.

2.1 Attitude to Smoking as a 'Rights' Issue and Readiness to Support Smokefree policy

Qualitative findings

Some studies reported an association between people's perceived right to smoke and patient and staff willingness to engage with and support smokefree policy. There is a belief that tobacco policy needs to acknowledge the patient's moral right to smoke (**Johnson 2010 [Canada, MHS, QS++]),** for example through the provision of designated smoking areas (**Arack 2009 [England, BHS, SCSS-]**) and the provision of smoking breaks on request (**Kotz 1993 [USA, MHS, CS-]**). These beliefs are evident in both mental health and wider secondary care settings and amongst both patients and staff, but appear to be magnified in mental health settings, particularly in relation to long stay psychiatric patients undergoing rehabilitation and continuing care where wards can be regarded as 'home' (**McNeill 2007 [Scotland, MHS, QS+]**; **HUG 2007 [Scotland, MHS, QS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2010 [England, MHS, QS++]**), and acutely ill and psychologically distressed patients who can be sectioned or detained against their will (**McNeill 2007 [Scotland, MHS, QS+]; HUG 2007 [Scotland, MHS, QS-]**). Legal challenges and threats to the implementation of smokefree polices on human rights grounds have led some implementers to advise incorporating legal counsel as part of policy development and to ensure smokers are actively consulted as part of the development process (**Parle 2004 [Canada, MHS, CS-]; Pritchard 2008 [England, MHS, QS++]**).

Identification with smoking as a patient rights issue was also associated with poor staff engagement in delivering cessation support. For example, administrators in one substance addictions unit gave cessation support a low treatment priority citing residents' right to smoke as a reason (**Drach 2012 [USA, MHS, QS-]**); while in another study paraprofessionals and professionals viewed their role in smoking cessation to be limited, stating that it was not their role to dictate what people should do with their lives (**Johnson 2010 [Canada, MHS, QS++]**). It is suggested in studies from the UK, that low utilisation of smoking cessation services is reflective of a failure to acknowledge the effects of smoking on patients' physical health (**Wareing 2012 [England, MHS, QS+]**) and to recognise smoking as an addiction or as serious an addiction as other dependency behaviours (**McNeill 2007 [Scotland, MHS, QS+]**; **Wareing 2012 [England, MHS, QS+]**) or, as another study noted, was not something that needed to be included as part of the patients care plan (**Ratschen 2009a [England, MHS, QS++]**). It has been suggested that healthcare staff are more likely to engage in providing cessation support when smoking is framed as an addiction requiring treatment rather than as a habit or moral issue where staff feel they do not have the right to intervene (**Schultz 2011 [Canada, BHS, QS++]**).

Quantitative findings

Several quantitative studies looked at staff and patient attitudes to rights issues surrounding smokefree policy (**Bloor 2006 [England, MHS, SCSS+]**; **Haller 1996 [USA, MHS, BAS+]**; **Matthews 2005 [USA, MHS, BAS-]; Ratschen 2009b [UK, MHS, SCSS++]**; **Voci 2010 [Canada, MHS, RCSS++]**). All of these studies were conducted in mental health settings.

Studies show that smokers were more likely to believe in the 'right to smoke' than non-smokers, and that non-smokers may be more likely to support the right to be protected from second-hand smoke than smokers. **Bloor et al's (2006 [England, MHS, SCSS+])** study reported a higher proportion of smoking staff than non-smoking staff in the mental health setting agreed that: staff should have the right to smoke if they wish (97% smokers, 69% former smokers, 82% never smokers); a non-smoking policy violates the personal freedom of smokers (94% smokers, 63% former smokers, 47% never smokers); and that smokers are victimised by the non-smoking policy (94% smokers, 59% former smokers, 43% never smokers). **Ratschen et al (2009b [UK, MHS, SCSS++])** reported that smoking staff in mental health settings were significantly less likely than non-smoking staff to agree that protecting patients and staff from second-hand smoke through smokefree policy was an important aim (59.3% of smokers agreed, compared with 75.1% of non-smokers, $p<0.05$).

In **Voci et al's (2010 [Canada, MHS, RCSS++]) ** study conducted in a mental health and addictions facility, the average levels of agreement among staff with the statements 'non-smoking clients have the right to be cared for in a 100% smokefree facility' and 'staff have the right to work in a 100% smokefree facility' were higher than the average level of agreement with the statement 'inpatient clients have a right to smoke'.

Two studies compared attitudes to rights issues before and after implementation of smokefree policy (**Haller 1996 [USA, MHS, BAS+]**; **Matthews 2005 [USA, MHS, BAS-]**). **Haller et al (1996 [USA, MHS, BAS+])** reported that mental health patients felt significantly less strongly that the ban was 'unfair and cruel' after implementation, compared with views before implementation ($p<0.05$). **Matthews et al (2005 [USA, MHS, BAS-])** reported that a higher proportion of nursing staff in the mental health setting believed that banning smoking was ethical after implementation than the proportion that held this belief before implementation. However, this finding was not significant.

A further study (**Baile 1991 [USA, BHS, SCSS+]**) assessed non-smokers' attitude towards the rights of a cancer treatment centre in the USA to implement a smokefree policy (prompted by a perceived

need for organisational protection from possible litigation). The study reported that 93% of non-smoker employees agreed that employers have a right to ban smoking on the worksite.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Attitude to smoking as a 'rights' issue and readiness to support smokefree policy

Evidence statements:

2.1 **Barrier: negative association between perceptions of smoking as a right and readiness to support smokefree policy by staff and patients.** Eight studies (six UK, two non-UK), seven of which were conducted in mental health settings and one in a broader secondary care setting, and six of which were conducted with staff and two with patients, found a negative association between readiness to support smokefree policy and perceptions of smoking as a right (**Johnson 2010 [Canada, MHS, QS++]; Arack 2009 [England, BHS, SCSS-]**; **Kotz 1993 [USA, MHS, CS-]**; **McNeill 2007 [Scotland, MHS, QS+]**; **HUG 2007 [Scotland, MHS, QS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2010 [England, MHS, QS++]**).

2.2 **Barrier: differences in belief by smoking status that smokers' have a right to smoke.** Two UK studies, both conducted in mental health settings, found that staff who smoke are more likely to believe in the 'right to smoke' and are less likely to support the right of non-smokers to be protected from second-hand smoke compared to non-smokers [**Bloor 2006 [England, MHS, SCSS+]**; **Ratschen 2009b [UK, MHS, SCSS++]**).

2.3 **Barrier: negative association between staff perceptions of smoking as a right and providing cessation support.** Two non-UK studies, both conducted in mental health settings, found a negative association between perceptions of smoking as a right and staff readiness to provide cessation support to patients (**Drach 2012 [USA, MHS, QS-]; Johnson 2010 [Canada, MHS, QS++]**).

2.4 **Facilitator: positive association between staff recognition of smoking as an addiction and readiness to provide cessation support.** Four studies (three UK, one non-UK), three conducted in mental health settings and one in a broader secondary care setting, reported a belief that staff are more likely to support the provision of cessation treatments when smoking is framed as an addiction or is acknowledged as having an impact on patient physical health worthy of treatment (**McNeill 2007 [Scotland, MHS, QS+]**; **Wareing 2012 [England, MHS, QS+]**; **Ratschen 2009a [England, MHS, QS++]**; **Schultz 2011 [Canada, BHS, QS++]**].

Of the 14 studies reported, the majority, 10, were conducted in the UK (**Arack 2009 [England, BHS, SCSS-]**; **McNeill 2007 [Scotland, MHS, QS+]**; **HUG 2007 [Scotland, MHS, QS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2010 [England, MHS, QS++]; Bloor 2006 [England, MHS, SCSS+]**; **Ratschen 2009b [UK, MHS, SCSS++]; Wareing 2012 [England, MHS, QS+]**; **Ratschen 2009a [England, MHS, QS++]**).

2.2 Impact of organisational factors on acceptance of smokefree policy

Three organisational factors were associated with adoption of smokefree policy: timing and phasing of the introduction of smokefree policy; giving due consideration to the wider policy context; and leadership, planning and feedback issues.

2.2.1 Impact of timing and phasing the introduction of smokefree on policy acceptance

Qualitative findings

Timing and phasing the introduction of smokefree policy were both seen to have a potential impact on successful implementation. Timing concerns related to seasonal factors and how prevailing weather conditions can affect people's preparedness to move to outdoor areas to smoke. Views expressed by mental health staff responsible for implementing smokefree policy in one Scottish study indicate that scheduling implementation to coincide with warmer months and longer daylight hours can assist in encouraging the transition to smokefree (**McNeill 2007 [Scotland, MHS, QS+]**). This is supported by patients' who consider smoking outdoors harder to accept in colder winter months in a second Scottish study (**HUG 2007 [Scotland, MHS, QS-]**).

Two UK studies also considered the pros and cons of phasing the introduction of smokefree policy against implementing policy in one step. There is no consensus on the best approach. However, an incremental approach appears to appeal to frontline staff as it facilitates a longer, more adaptive process, although it requires more time and resources (**McNeill 2007 [Scotland, MHS, QS+]**; **Mental Health Foundation 2009 [England, MHS, SCSS+]**). It has been suggested that the pace adopted might best be tailored to reflect the prevailing context and setting (**McNeill 2007 [Scotland, MHS, QS+]**).

Quantitative findings

No quantitative evidence was identified relating to this theme.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Impact of timing and phasing the introduction of smokefree on policy acceptance

Evidence statements:

2.5 **Facilitator: timing implementation to take advantage of prevailing weather conditions.** Two UK studies, both conducted in mental health settings, reported that giving consideration to seasonal weather conditions at the time of implementation may have an impact on smokers willingness to smoke outdoors (**McNeill 2007 [Scotland, MHS, QS+]**; **HUG 2007 [Scotland, MHS, QS-]**).

2.6 **Inconclusive: introducing smokefree policy in one or more steps.** Two UK studies, both conducted in mental health settings, considered the effectiveness of phasing the introduction of smokefree policy against implementing policy in one single step. There was no consensus on the more effective approach. (**McNeill 2007 [Scotland, MHS, QS+]**; **Mental Health Foundation 2009 [England, MHS, SCSS+]**).

All three of the studies reported were conducted within the UK (**McNeill 2007 [Scotland, MHS,**

QS+; **HUG 2007 [Scotland, MHS, QS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]**).

2.2.2 Impact of the prevailing policy context on acceptance of smokefree policy

Qualitative findings

A number of studies have considered the wider policy context and how this might affect expectations and acceptance of smokefree policy in secondary care and mental health settings. Early UK studies conducted in the 1990s into smoking restrictions in secondary care settings indicated strong institutional barriers to adopting smokefree policies which were responsible for lead times having to be extended and the adoption of an incremental approach to policy development and the creation of smokefree spaces (**Seymour 2000 [England, BHS, CS-]**). However, more recent findings from the UK and Ireland suggest that the creation of smokefree public spaces in the wider community brought about by legislative change was seen to contribute to successful implementation of smokefree policy in secondary care by establishing new smoking norms and expectations (**Fitzpatrick 2009 [Ireland, BHS, MMS+]**; **Ratschen 2008 [England, BHS, MHS, MMS+]**). Similar findings have also been found in UK psychiatric services where effective implementation of smokefree polices in broader secondary care settings and in the wider community can help to change smoking norms and increase staff confidence that it can be achieved (**Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]**).

These same patterns have also been observed in US studies. Here, implementers' views indicate that it can be difficult to implement smokefree policy where acceptability of smoking in the care setting has not previously been contested (**Karan 1993 [USA, MHS, CS-]**); and where policy is seen to be new and innovative (**Jessup 2007 [USA, MHS, QS++]**). However, where policy forms part of wider changes to the introduction of smokefree environments this has been found to take the pressure off hospitals (**Sheffer 2009 [USA, BHS, BAS+]**). Experience in the US also indicates implementation to be more successful where policies are initiated at a state-wide level rather than a facility level, as individual services are able to benefit from centralised leadership and to support and learn from other services (**Drach 2012 [USA, MHS, QS-]**).

Quantitative findings

No quantitative evidence was identified relating to this theme.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Impact of the prevailing policy context on acceptance of smokefree policy

Evidence statements:

2.7 **Barrier: settings where smoking has not previously been contested.** Three studies (one UK, two non-UK), all conducted in mental health settings, attribute difficulties in implementing and acceptance of smokefree policy to policies of this kind being new and smoking not having previously been contested (**Seymour 2000 [England, BHS, CS-]; Karan 1993 [USA, MHS, CS-]**; **Jessup 2007 [USA, MHS, QS++]).**

2.8 **Facilitator: context where smokefree norms are already widely established.** Five studies (two UK, three non-UK), two conducted in mental health settings and three in broader health care settings, suggest that acceptance of smokefree policy is greater where smokefree

norms are already established in adjacent communities and where implementation forms part of a broader initiative (**Fitzpatrick 2009 [Ireland, BHS, MMS+]**; **Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]; Sheffer 2009 [USA, BHS, BAS+]**; **Drach 2012 [USA, MHS, QS-]**).

Three of the eight studies reported were conducted in the UK (**Seymour 2000 [England, BHS, CS-]; Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]**) and one was judge to have similar applicability to the UK (**Fitzpatrick 2009 [Ireland, BHS, MMS+]**).

2.2.3 Impact of leadership, planning and feedback on acceptance of smokefree policy

Qualitative findings

Findings from studies in mental health settings indicate that strong and supportive leadership is important to facilitating policy implementation, by helping to secure resources, preparing the service for change and persuading sceptics and detractors (**McNeill 2007 [Scotland, MHS, QS+]; Jessup 2007 [USA, MHS, QS++]**; **Karan 1993 [USA, MHS, CS-]**). A recent survey of mental health services in England found that variation in compliance achieved by different psychiatric units could be attributed to the influence of individual unit managers (**Wareing 2012 [England, MHS, QS+]**). Similar findings are also reported in secondary care settings where senior management support is considered important to implementation, as is identifying advocates or 'champions' who are in a position to engage senior executives and to shape local tobacco policy (**Seymour 2000 [England, BHS, CS-]**).

Findings from studies in both secondary care and mental health settings indicate that planning and feedback processes can influence implementation. Studies in mental health settings highlight the importance of having a clear planning process which provides sufficient time for policy development, stakeholder consultation, consensus building and preparing the service for change through appropriate training, integration of treatment support and communication of new rules (**McNeill 2007 [Scotland, MHS, QS+]**; **Jessup 2007 [USA, MHS, QS++]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**). Having comprehensive mechanisms in place for consulting with staff and patients, and informing them of rule changes are also considered important (**Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]**), an issue also highlighted in broader secondary care settings (**Ratschen 2008 [England, BHS, MHS, MMS+]**). Other cases in mental health settings provide illustrations of how lack of time spent on planning and inadequate consultation with stakeholders contributed to policy failure (**Karan 1993 [USA, MHS, CS-]; Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2009a [England, MHS, QS++]**).

Similar findings have also been found in secondary care settings. Early efforts in the UK to implement smoking restrictions in hospitals were in some cases hampered by a lack of staff consultation and a failure to listen to staff (**Seymour 2000 [England, BHS, CS-]**). Following these experiences, measures were introduced to involve staff and to address staff concerns regarding security and how to deal with difficult situations (**Seymour 2000 [England, BHS, CS-]**).

In addition to planning process, having systems in place for monitoring implementation and responding to difficulties as these emerge, have also been found to support implementation. One study highlighted the value of developing a culture of critical evaluation, where staff can review and modify practice in accordance with lessons acquired from implementing policy (**Campion 2008 [Australia, MHS, QS+]**). Other cases highlight the role played by management in policy failures,

where lack of management commitment to actively addressing problems with implementation was identified as a significant barrier (**McNeill 2007 [Scotland, MHS, QS+]; Wareing 2012 [England, MHS, QS+]**).

Quantitative findings

No quantitative evidence was identified relating to this theme.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Impact of leadership, planning and feedback on acceptance of smokefree policy

Evidence statements:

2.9 **Facilitator: strong leadership.** Five studies (three UK, two non-UK), four conducted in mental health settings and one in a broader secondary care setting, made specific reference to the importance of strong leadership in supporting implementation of smokefree policy, and this was found to be particularly important to securing resources, preparing the service for change and persuading sceptics and detractors**.** (**McNeill 2007 [Scotland, MHS, QS+]**; **Jessup 2007 [USA, MHS, QS++]**; **Karan 1993 [USA, MHS, CS-]; Wareing 2012 [England, MHS, QS+]; Seymour 2000 [England, BHS, CS-]**].

2.10 **Facilitator: clear planning process.** Four studies (three UK, one non-UK) all conducted in mental health settings, highlight the importance of having a clear planning process and sufficient time for policy development, stakeholder consultation, consensus building and preparing the service for change. (**McNeill 2007 [Scotland, MHS, QS+]**; **Jessup 2007 [USA, MHS, QS++]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**]. Three studies (two UK, one non-UK), two conducted in a mental health settings and one in a broader secondary care setting, suggest that having in place comprehensive mechanisms for consulting with staff and patients, and informing them of rule changes are also important (**Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]; Ratschen 2008 [England, BHS, MHS, MMS+])**.

2.11 **Barrier: lack of staff consultation.** One UK study conducted in a broad secondary care setting illustrates how lack of staff consultation and a failure to listen to staff can hamper implementation [**Seymour 2000 [England, BHS, CS-]**].

2.12 **Facilitator: culture of critical evaluation.** One Australian study conducted in a mental health setting highlights the value of developing a culture of critical evaluation, where staff can review and modify practice in accordance with lessons acquired from implementing policy (**Campion 2008 [Australia, MHS, QS+]**).

2.13 **Barrier: poor management commitment.** Two UK studies conducted in mental health settings illustrate how a lack of management commitment to actively addressing problems with implementation can act as an organisational barrier (**McNeill 2007 [Scotland, MHS, QS+]; Wareing 2012 [England, MHS, QS+]**].

Of the 10 studies reported the majority, six, were conducted in the UK (**McNeill 2007 [Scotland, MHS, QS+]**; **Wareing 2012 [England, MHS, QS+]; Seymour 2000 [England, BHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]; Ratschen**

2008 [England, BHS, MHS, MMS+]) and one was judge to have similar applicability to the UK (**Campion 2008 [Australia, MHS, QS+]**).

2.3 Factors relating to policing and enforcement and acceptance of smokefree policy

Enforcement of smokefree policy emerged as a significant theme in both mental health and secondary care settings. The following sub-themes were identified which illuminate the challenges of enforcing smokefree polices in these settings: type of mental health facility; staff commitment to policy enforcement; staff support and resource needs to enforce policy; clarity and consistency in application of smokefree rules; provisions for smokers to support compliance; and dealing with underground markets for tobacco products.

2.3.1 Type of mental health facility and ease of enforcement

Qualitative findings

In mental health settings the type of facility was reported to have an impact on ease of enforcement. Two studies found enforcement of no smoking rules to be easier in secure facilities than on open facilities and admission wards (**Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**), although the escorting of forensic patients and patients who have been sectioned and under close observation to outdoor areas could require more resources (**Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+]; Ratschen 2009a [England, MHS, QS++]**). The rapid inpatient turnover and larger numbers of inpatients involved in open settings was described as making enforcement more difficult (**Mental Health Foundation 2009 [England, MHS, SCSS+]**), while the higher level of control over movement of patients, relatives and staff in secure facilities were reported to make enforcement easier (**Pritchard 2008 [England, MHS, QS++]**). A recent survey of mental services in England found difficulties implementing smokefree policy in medium secure and day care units and to a lesser degree in acute inpatient units (**Wareing 2012 [England, MHS, QS+]**).

Quantitative findings

No quantitative evidence was identified relating to this theme.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Type of mental health facility and ease of enforcement

Evidence statement:

2.14 Facilitator: easier to enforce in secure mental health facilities compared to open facilities. Two UK studies reported enforcement of smokefree rules to be easier in secure mental health facilities compared with open facilities, which was attributed to smaller numbers of patients and greater control over patient movement in secure settings [**Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**]. However, despite being more straightforward to enforce in secure settings, three UK studies reported that policing in these settings required additional resources (**McNeill 2007 [Scotland, MHS, QS+]; Ratschen 2009a [England, MHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+]**).

All five of the studies reported were conducted within the UK (**Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**; **McNeill 2007 [Scotland, MHS, QS+]; Ratschen 2009a [England, MHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+]**).

2.3.2 Staff commitment to enforcing smokefree policy

Qualitative findings

Staff commitment to enforce smokefree policy is considered central to its success (**Karan 1993 [USA, MHS, CS-]**) However, healthcare and nursing staff can be reluctant to police smokefree policy, often not seeing it as part of their role (**McNeill 2007 [Scotland, MHS, QS+]**; **Kotz 1993 [USA, MHS, CS-]**). Similar patterns have also been reported in relation to escorting patients (**McNeill 2007 [Scotland, MHS, QS+]**) with some regarding it as inappropriate or wasteful of their time (**Mental Health Foundation 2009 [England, MHS, SCSS+]**).

Quantitative findings

A study of staff views in an English general hospital with a smokefree policy that extended to hospital grounds (**Shipley 2008 [England, BHS, SCSS+]**) found that 25% of staff had challenged patients for violating the policy, 13% had challenged visitors, and only 8% had challenged another member of staff. Of staff who had not challenged anyone, the minority (21%) said they would do so in the future, and of those who said that they would not do so, the second most commonly cited reason behind fear of aggression was that they did not consider it their job to enforce smokefree policy.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Staff commitment to enforcing smokefree policy

Evidence statement:

2.15 **Barrier: willingness to accept responsibility for enforcement.** Four studies (three UK, one non-UK), three conducted in mental health settings and one in a broader secondary care setting, found a reluctance amongst healthcare staff to assume responsibility for escorting patients and enforcing smokefree policy (**McNeill 2007 [Scotland, MHS, QS+]**; **Kotz 1993 [USA, MHS, CS-]; Shipley 2008 [England, BHS, SCSS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]**).

Three of the four studies reported were conducted in the UK (**McNeill 2007 [Scotland, MHS, QS+]**; **Shipley 2008 [England, BHS, SCSS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]**).

2.3.3 Staff support needs and enforcement of smokefree policy

Qualitative findings

Concerns were expressed by staff about their ability to enforce smokefree policy with some staff feeling powerlessness to act resolutely when confronted by patients who fail to comply (**Schultz 2011 [Canada, BHS, QS++]**; **Arack 2009 [England, BHS, SCSS-]**). This was a particular issue for staff working in mental health settings who sometimes felt they lacked the necessary management support and skills to defuse difficult and potentially threatening situations (**Ratschen 2008 [England,**

BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+]). There was an expressed need from those working in these settings for greater care and preparation at the planning stage (**McNeill 2007 [Scotland, MHS, QS+]**), better guidance on how to deal with violations (**Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]**), and additional training on how to recognise withdrawal symptoms and de-escalate smoking- related situations (**McNeill 2007 [Scotland, MHS, QS+]; Campion 2008 [Australia, MHS, QS+]; Ratschen 2009a [England, MHS, QS++]**). Distressed or psychotic patients who are unwell and not prepared or able to comply have been found to present significant challenges to enforcement and to require particular consideration (**Mental Health Foundation 2009 [England, MHS, SCSS+]**).

Quantitative findings

No quantitative evidence was identified relating to this theme

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Staff support needs and enforcement of smokefree policy

Evidence statements:

2.16 **Barrier: perceived ability to enforce smokefree policy.** Four studies (three UK, one non-UK), one conducted in a mental health setting and the three in broader secondary care settings, reported that staff felt they lacked confidence in their ability to enforce the policy and in particular to deal with patients who challenged their authority (**Schultz 2011 [Canada, BHS, QS++]**; **Arack 2009 [England, BHS, SCSS-]**; **Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+])**.

2.17 **Barrier: inadequate guidance and training on dealing with violations.** Six studies (four UK, two non-UK), five conducted in mental health settings and one in a broader secondary care setting, reported instances where staff expressed a need for better guidance and training on how to deal with violations and to de-escalate smoking-related situations (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]; Campion 2008 [Australia, MHS, QS+]; Ratschen 2009a [England, MHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+]**).

Of the eight studies reported the majority, five, were conducted in the UK (**Arack 2009 [England, BHS, SCSS-]**; **Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Ratschen 2009a [England, MHS, QS++]**) and one was conducted in a country judge to have similar applicability to the UK (**Campion 2008 [Australia, MHS, QS+]**).

2.3.4 Importance of consistency and clarity of smokefree rules to policy enforcement

Qualitative findings

Active involvement and consistent application of rules by staff are considered central to effective enforcement of smokefree policy (**Ratschen 2008 [England, BHS, MHS, MMS+]; Wareing 2012 [England, MHS, QS+]**). Lack of clarity on policy or inconsistency in how rules are applied have been linked with poor compliance (**Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Wareing**

2012 [England, MHS, QS+]). Specific failings identified include lack of clarity on: exemptions (**Pritchard 2008 [England, MHS, QS++]**); who is responsible for policing the policy (**McNeill 2007 [Scotland, MHS, QS+]**); and how to respond to instances of non-compliance (**Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]**). On the question of exemptions, there can be uncertainty as to whether to implement blanket bans on smoking or to allow exemptions (**Ratschen 2008 [England, BHS, MHS, MMS+]**). Giving staff the freedom to grant concessions on a case-by-case basis is considered an appropriate way of managing difficult situations. However, there can be a concern that discretionary powers may be used by staff as an excuse to allow smoking (**Ratschen 2008 [England, BHS, MHS, MMS+]**) and that this in turn can encourage non-compliance and cessation relapse (**McNeill 2007 [Scotland, MHS, QS+]**). A recent UK study identified no exceptions to practice as a key criterion for successful implementation of smokefree policy (**Wareing 2012 [England, MHS, QS+]**).

Inconsistent application of smoking policy can be seen to have a negative impact on the therapeutic environment, creating feelings of anger and frustration amongst patients, and ultimately leading to conflict and unrest (**Campion 2008 [Australia, MHS, QS+]; Karan 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]**) and in some cases undermining the efforts of patients engaged in stopping smoking (**Karan 1993 [USA, MHS, CS-]**). Inconsistencies in application between staff and patient have also been associated with unrest and patient's willingness to comply (**Karan 1993 [USA, MHS, CS-]**).

Inconsistencies have also been linked with structural factors. Where premises are shared or in close proximity to other health providers or psychiatric services, differing approaches to enforcement and application of exemptions can lead to frustration (**McNeill 2007 [Scotland, MHS, QS+]; Pritchard 2008 [England, MHS, QS++]**). In these situations it is suggested a standardised approach to policy decisions is required (**Karan 1993 [USA, MHS, CS-]; Pritchard 2008 [England, MHS, QS++]**).
The failure in some cases to clearly define and communicate policy, for example posting signs indicating that 'this hospital is smokefree' without indicating if the requirement applies to buildings alone or together with grounds, can also cause confusion and contribute to poor compliance (**Wareing 2012 [England, MHS, QS+]**).

Quantitative findings
No quantitative evidence was identified relating to this theme.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Importance of consistency and clarity of smokefree rules to policy enforcement

Evidence statement:

2.18 **Barrier: lack of clarity and inconsistency in application of rules.** Eight studies (five UK, three non-UK), seven conducted in mental health settings and one in a broader secondary care setting, found that lack of clarity on policy and inconsistencies in the way in which smokefree rules are applied can adversely affect compliance and the wider therapeutic environment (**Mental Health Foundation 2009 [[England, MHS, SCSS+]**; **Wareing 2012 [England, MHS, QS+]**; **Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+]; Parle 2004 [Canada, MHS, CS-]; Campion 2008 [Australia, MHS, QS+]; Karan 1993 [USA, MHS, CS-])**.

Of the eight studies reported the majority, five, were conducted in the UK (**Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Wareing 2012 [England, MHS, QS+]**; **Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+]**) and one was conducted in a country judge to have similar applicability to the UK (**Campion 2008 [Australia, MHS, QS+]**).

2.3.5 Importance of special provisons for smokers and compliance with smokefree policy

Qualitative findings

There is a belief amongst staff in both mental health and wider secondary care settings that the provision of outdoor smoking areas (**Schultz 2011 [Canada, BHS, QS++]; Wheeler 2007 [USA, BHS, MMS-]; Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+]**), and where necessary secure smoking areas (**McNeill 2007 [Scotland, MHS, QS+]**), are required to combat patient aggression and facilitate successful enforcement indoors (**Ratschen 2008 [England, BHS, MHS, MMS+]**). These qualitative findings are also consistent with quantitative findings relating to the staff preferences for type of smokefree policy (see Section 1.3) and with other qualitative findings with reports of staff and patients calling for the right to smoke outdoors (**Wareing 2012 [England, MHS, QS+]**) and the provision of designated areas to facilitate smoking on hospital grounds (**Ratschen 2008 [England, BHS, MHS, MMS+]; HUG 2007 [Scotland, MHS, QS-]; Ratschen 2010 [England, MHS, QS++]**). Where outdoor areas are not provided, there can be a lack of understanding amongst patients as to the reason for not providing designated smoking areas (**HUG 2007 [Scotland, MHS, QS-]**), with some assuming designated outdoor areas are appropriate and would not interfere with the aim of protecting non-smokers against environmental tobacco smoke (**Ratschen 2008 [England, BHS, MHS, MMS+]**).

Failure to take account of smokers' needs has been associated with poor compliance. For example, resulting in unofficial smoking areas becoming established on hospital grounds (**Ratschen 2009a [England, MHS, QS++]; Ratschen 2010 [England, MHS, QS++]**) and calls for improved enforcement and detection measures in locations where secret smoking is known to take place (**Seymour 2000 [England, BHS, CS-]**). Similarly, the provision of outside smoking facilities that are not considered acceptable and safe, (i.e. offer inadequate protection from bad weather, are poorly lit and located in isolated positions, and do not provide panic buttons or incorporate surveillance cameras), has been associated with poor compliance and use (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]**), while well-equipped and well-positioned outdoor facilities have been associated with good compliance (**Arack 2009 [England, BHS, SCSS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]**).

Poor compliance is also associated with not having sufficient staff resources to: escort patients to outside areas (**McNeill 2007 [Scotland, MHS, QS+]; Karan 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**), particularly secure patients (**Ratschen 2009a [England, MHS, QS++]**); provide surveillance in designated areas (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]**); patrol hospital grounds (**Arack 2009 [England, BHS, SCSS-]; Wareing 2012 [England, MHS, QS+]**); and deal with smoking-related incidents (**Mental Health Foundation 2009 [England, MHS, SCSS+]**). Conversely, adequate staffing levels to monitor compliance and escort patients to outdoor areas has been associated with successful implementation of smokefree policy (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]**).

Structural factors have also been reported to influence compliance, where poor access to external smoking areas brought about by service location, for example wards located on upper floors, can discourage the use of such facilities (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]**). Similarly, policing grounds can also prove difficult, especially where these are large and there are common areas and thoroughfares shared by members of the public (**McNeill 2007 [Scotland, MHS, QS+]; Wareing 2012 [England, MHS, QS+]**).

Quantitative findings

No quantitative evidence was identified relating to this theme.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Importance of special provisions for smokers and compliance with smokefree policy

Evidence statements:

2.19 Facilitator: a belief that designated smoking areas are necessary to support compliance. Four studies (two UK, two non-UK), one conducted in a mental health setting and three in broader secondary care settings, suggest staff support for smokefree policy is predicated on a belief that designated areas are necessary to support compliance (**Schultz 2011 [Canada, BHS, QS++]; Wheeler 2007 [USA, BHS, MMS-]; Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+])**. Two UK studies, both conducted in mental health settings, reported unofficial smoking areas becoming established on hospital grounds in the absence of designated smoking areas [**Ratschen 2009a [England, MHS, QS++]; Ratschen 2010 [England, MHS, QS++]**).

2.20 Barrier: association between poorly designed smoking areas and poor compliance. Two UK studies, both conducted in mental health settings, suggest that poor compliance is associated with poorly equipped and positioned smoking areas (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]**].

2.21 Facilitator: association between well-designed smoking areas and good compliance. Two UK studies, one conducted in a mental health setting and another in a broader secondary care setting, reported a positive association between compliance and well equipped and positioned outdoor smoking areas **Arack 2009 [England, BHS, SCSS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]**].

2.22 Barrier: insufficient staff resources to police smokefree policy on hospital grounds. Seven studies (six UK, one non-UK), six conducted in mental health settings and one in a broader secondary care setting, reported a lack of staff resources to escort patients and patrol hospital grounds as a reason for poor compliance (**McNeill 2007 [Scotland, MHS, QS+]; Karan 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2009a [England, MHS, QS++]**; **Arack 2009 [England, BHS, SCSS-]; Wareing 2012 [England, MHS, QS+]**].

2.23 Barrier: structural limitations adversely affect compliance and enforcement. Three UK studies, all conducted in mental health settings, identified poor access to outside areas and large, shared grounds as factors responsible for poor compliance and difficulties in policing (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS,**

SCSS+]; **Wareing 2012 [England, MHS, QS+]**].

Of the 11 studies reported the majority, eight, were conducted within the UK (**Ratschen 2008 [England, BHS, MHS, MMS+]; McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Arack 2009 [England, BHS, SCSS-]; Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2009a [England, MHS, QS++]**; **Ratschen 2010 [England, MHS, QS++]**; **Wareing 2012 [England, MHS, QS+]**).

2.3.6 Emergence of underground markets for tobacco and enforcement of smokefree policy

Qualitative findings

In some mental health settings implementation of smokefree policies has been implicated in the development of underground markets for smuggled tobacco products which has created additional challenges for enforcement (**Karan 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]**). Visitors and relatives can pose a particular problem in this setting by secretly supplying tobacco to inpatients (**Mental Health Foundation 2009 [England, MHS, SCSS+]**). Within secure forensic facilities, reclassifying tobacco as a contraband item has facilitated routine searches of visitors, patients and staff members entering the premises, contributing to the creation of a smokefree environment (**Pritchard 2008 [England, MHS, QS++]**). In other cases, markets for contraband tobacco have been reported in the grounds surrounding psychiatric services where patients have unsupervised access (**Parle 2004 [Canada, MHS, CS-]**) which creates challenges for patrolling grounds.

Quantitative findings

No quantitative evidence was identified relating to this theme.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Emergence of underground markets for tobacco and enforcement of smokefree policy

Evidence statements:

2.24 Barrier: emergence of underground markets creates additional challenges for enforcement. Three studies (one UK, two non-UK), all conducted in mental health settings, report the emergence of an underground market for tobacco products following implementation, with visitors and relatives posing a particular problem in supplying contraband tobacco (**Karan 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]**).

2.25 Facilitator: implementing search policies more straightforward in secure settings. One UK study conducted in a secure forensic mental health facility reported that reclassifying tobacco as a contraband item had facilitated routine searches of visitors, patients and staff members entering the premises (**Pritchard 2008 [England, MHS, QS++]**).

Two of the four studies reported were conducted within the UK (**Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**).

2.4 Factors relating to the provision of cessation support and acceptance of smokefree policy

Two themes emerged in relation to smokefree provisions for cessation support in secondary care and acceptance of smokefree policy; patient motivation and the conditions under which patients were prepared to engage with cessation support; and staff support and resource needs necessary to deliver cessation support to patients.

2.4.1 Patient motivation and willingness to engage in cessation support as part of a smokefree policy

Qualitative findings

Patients identify smokefree hospitals as a possible trigger to stop smoking (**HUG 2007 [Scotland, MHS, QS-]**) and cessation support to be potentially useful provided if is offered in a compassionate, non-coercive manner, and as a means of improving patient health rather than as an isolated measure that can be seen merely as punitive (**HUG 2007 [Scotland, MHS, QS-]**). Similarly, successful smokefree implementation is associated with policy that is presented as part of a wider public health drive to improve the health of patients and staff (**Mental Health Foundation 2009 [England, MHS, SCSS+]**), including, where relevant, perinatal benefits (**Jessup 2007 [USA, MHS, QS++]**). These findings appear to show strong consistency with views expressed by healthcare staff, which indicates staff to be more likely to engage in providing cessation support when smoking is framed as an addiction (see Section 2.1).

Patients also caution that dealing with mental illness can be traumatic (**Ratschen 2010 [England, MHS, QS++]**) and that being admitted to hospital can be a point in their lives where they are dealing with a host of problems making stopping smoking and dealing with the symptoms of withdrawal difficult (**HUG 2007 [Scotland, MHS, QS-]**), views also supported by hospital staff who describe discussions about smoking cessation as "hassling clients" about "one more thing" (**Drach 2012 [USA, MHS, QS-]; Johnson 2010 [Canada, MHS, QS++]; Ratschen 2009a [England, MHS, QS++]**). Consequently patients state that they need help to give up when they are ready and prepared to do so (**HUG 2007 [Scotland, MHS, QS-]**). Some inpatients express a greater interest in cutting down their consumption than quitting (**Ratschen 2010 [England, MHS, QS++]**) underlining a need for support not merely to help quit attempts but also to minimise harm and encourage a reduction in use and temporary abstinence (**Wareing 2012 [England, MHS, QS+]**).

Quantitative findings

No quantitative evidence was identified relating to this theme

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Patient motivation and willingness to engage in cessation support as part of a smokefree policy#

Evidence statements:

2.26 **Facilitator: belief that take-up of cessation support can be influenced by the way in which advice is framed.** Three studies (two UK, one non-UK), all conducted in metal health settings, suggest that patients are more likely to engage with cessation services when advice is delivered in a non-coercive manner and is motived by a desire to improve patient

health, and not merely to support the smokefree policy (**HUG 2007 [Scotland, MHS, QS-]**; **Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Jessup 2007 [USA, MHS, QS++])**.

2.27 **Barrier: belief that take-up of cessation support is dependent upon patient readiness to quit.** One UK study conducted in relation to mental health settings reported that smokefree facilities can act as a trigger to consider quitting but also found patient willingness to engage with cessation support is dependent upon their readiness to stop (**HUG 2007 [Scotland, MHS, QS-]**). Two UK studies, both conducted in mental health settings, found some patients were motivated to take up support for temporary abstinence and to reduce consumption rather than to quit [**Ratschen 2010 [England, MHS, QS++]; Wareing 2012 [England, MHS, QS+]**].

Of the five studies reported the majority, four, were conducted within the UK (**HUG 2007 [Scotland, MHS, QS-]**; **Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Ratschen 2010 [England, MHS, QS++]; Wareing 2012 [England, MHS, QS+]**).

2.4.2 Staff support and resource needs necessary to encourage patient engagement in cessation support as part of a smokefree policy

Four sub-themes relating to staff support and resources were identified: staff training needs, continuity of support with community cessation services; cessation support for staff who smoke; and perceived gaps in provision of cessation resources.

Qualitative findings

a. Staff training needs

Some healthcare staff saw smoking cessation as requiring a specialised set of skills which was beyond their domain and identified a lack of training and knowledge regarding tobacco use as a barrier to engaging patients (**Johnson 2010 [Canada, MHS, QS++]**). Some healthcare staff indicated a willingness to assess patients' readiness to quit but were not prepared to support implementation of smoking cessation goals (**Johnson 2010 [Canada, MHS, QS++]**) which appears to support reported gaps in the provision of brief intervention training (see Section 2.4.2d).

b. Continuity with patient cessation support provided in the community

Delivering effective smoking cessation to inpatients was considered harder to plan and implement where patients were not being offered cessation support in the community or informed that they would not be allowed to smoke once admitted (**Mental Health Foundation 2009 [England, MHS, SCSS+]**). The absence of clear protocols and referral pathways to community-based cessation support for patients discharged from hospital were reported in both mental health and wider secondary care settings (**Schultz 2011 [Canada, BHS, QS++]; McNeill 2007 [Scotland, MHS, QS+]**). A recent survey of mental health services in England indicates limited contact between mental health units and NHS stop smoking services, with most only contacting units on request (**Wareing 2012 [England, MHS, QS+]**).

c. Cessation support for staff who smoke

Availability of cessation support for staff who smoke was seen as an important element of the preparation for and potential success of a smokefree policy (**McNeill 2007 [Scotland, MHS, QS+]**) with a belief that staff should be afforded the same kind of support as patients (**Jessup 2007 [USA, MHS, QS++]**). Findings suggest that uptake of cessation support by staff was sometimes lower than

had been planned for, in some cases resulting in reductions in provision (**Tillgren 1998 [Sweden, BHS, QS-]; Ratschen 2008 [England, BHS, MHS, MMS+]**).

d. Gaps in provision of cessation resources

Some studies and participant reports identify significant gaps or inequities in the supply of cessation resources for mental health patients; information materials, NRT and staff training (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2010 [England, MHS, QS++]**; **Wareing 2012 [England, MHS, QS+]**). Similar gaps or shortages were also noted in wider secondary care settings (**Schultz 2011 [Canada, BHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+]**). Details are limited but a number of specific gaps were identified from recent UK studies in mental health settings which included; measures to ensure availability of a range of pharmacotherapies including NRT and gum (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2010 [England, MHS, QS++]**; **Wareing 2012 [England, MHS, QS+]**); and staff trained to deliver brief interventions (**McNeill 2007 [Scotland, MHS, QS+]; Wareing 2012 [England, MHS, QS+]**), to manage nicotine addiction and interactions with antipsychotic medications (**McNeill 2007 [Scotland, MHS, QS+]; Ratschen 2009a [England, MHS, QS++]; Wareing 2012 [England, MHS, QS+]**) and to provide specialist support (**Wareing 2012 [England, MHS, QS+]**). One study found staff had a poor understanding of the detrimental effects of smoking (**Ratschen 2009a [England, MHS, QS++]),** while another reported an inability amongst staff to assess nicotine dependency and to prescribe appropriate pharmacotherapy to adequately alleviate cravings and withdrawal (**Wareing 2012 [England, MHS, QS+]**).

In some cases gaps in provision of resources were attributed to low awareness rather than low availability (**McNeill 2007 [Scotland, MHS, QS+]**), again something also observed in broader secondary care settings (**Arack 2009 [England, BHS, SCSS-]**). In other cases, gaps relate to the way in which resources are delivered. For example, supplying nicotine patches on admission without guidance on their use, or any offer of behavioural support (**Ratschen 2010 [England, MHS, QS++]**).

Provision of a varied range of therapeutic, diversionary activities to compensate for smoking was also considered important to supporting cessation and temporary abstinence (**Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]; Campion 2008 [Australia, MHS, QS+]; Wareing 2012 [England, MHS, QS+]**) and was also identified as a significant gap (**McNeill 2007 [Scotland, MHS, QS+]**; **Wareing 2012 [England, MHS, QS+]**). This is supported by patient accounts of their reasons for smoking as a means of relaxing and overcoming boredom (**HUG 2007 [Scotland, MHS, QS-]**) and as a way of socialising with other patients (**HUG 2007 [Scotland, MHS, QS-]**).

Quantitative findings

No quantitative evidence was identified relating to any of these sub-themes.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Staff support and resource needs necessary to encourage patient engagement in cessation support as part of a smokefree policy

Evidence statements:

2.28 **Barrier: poor continuity with cessation support in the community.** Four studies (three UK, one non-UK), three conducted in mental health settings and one in a broader secondary

care setting, found that poor communication and continuity of support with cessation services in the community made providing cessation support for inpatients as part of a smokefree policy harder to plan and implement [**Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Schultz 2011 [Canada, BHS, QS++]; McNeill 2007 [Scotland, MHS, QS+]**; **Wareing 2012 [England, MHS, QS+]**].

2.29 **Facilitator: provision of cessation support for staff.** Two studies (one UK, one non-UK), both conducted in mental health settings, suggest that providing cessation support to staff as well as patients is important to successful implementation of smokefree policy (**McNeill 2007 [Scotland, MHS, QS+]**; **Jessup 2007 [USA, MHS, QS++])**. Two other studies (one UK, one non-UK), both conducted in broader secondary care settings, found that take-up of such services by staff to be low (**Tillgren 1998 [Sweden, BHS, QS-]; Ratschen 2008 [England, BHS, MHS, MMS+]**).

2.30 **Barrier: gaps in provision of cessation resources.** Seven studies (six UK, one non-UK), five conducted in mental health settings and two in broader secondary care settings, reported gaps and inequities in the provision of important cessation resources and support as part of a smokefree policy relating to four mains areas; information materials, pharmacotherapies, trained staff and diversionary activities (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2010 [England, MHS, QS++]**; **Wareing 2012 [England, MHS, QS+]**; **Schultz 2011 [Canada, BHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+])**.

Of the eight studies reported the majority, six, were conducted within the UK (**Mental Health Foundation 2009 [England, MHS, SCSS+]**; **McNeill 2007 [Scotland, MHS, QS+]**; **Ratschen 2008 [England, BHS, MHS, MMS+]; Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2010 [England, MHS, QS++]**; **Wareing 2012 [England, MHS, QS+]**).

2.5 Mental health patient groups identified as requiring special consideration when devising smokefree policy

Three mental health patient groups are identified as requiring special consideration and potential exemption status from smokefree policy: long-stay psychiatric patients receiving continuing care; cognitively impaired and acutely ill psychiatric patients; and patients being treated for other addictive disorders. Other groups requiring similar consideration include bereaved relatives and patients receiving palliative care (**Ratschen 2008 [England, BHS, MHS, MMS+]**).

2.5.1 Long-stay psychiatric patients

Qualitative findings

The grounds for affording long-stay psychiatric patients special attention relates exclusively to smoking being seen as a human rights issue and the patient care setting assuming the status of 'home'. The identified evidence is described under Section2.1, 'Attitudes to smoking as a rights issue and willingness to engage in smokefree policy'.

Quantitative findings

No quantitative evidence was identified relating to this theme.

2.5.2 Acutely ill and cognitively impaired psychiatric patients

Qualitative findings

Staff working in mental health settings express concern that patients with acute mental illness who are often admitted in crisis under emergency conditions can be particularly disruptive and difficult to treat, and present an increased risk to staff if denied access to cigarettes in a smokefree setting (**McNeill 2007 [Scotland, MHS, QS+]**; **Campion 2008 [Australia, MHS, QS+]**; **Mental Health Foundation 2009 [England, MHS, SCSS+]**). Similar concerns are also raised in connection with cognitively impaired patients with limited capacity to understand and to retain the information surrounding a smokefree policy, such as patients with dementia (**Pritchard 2008 [England, MHS, QS++]**). Advocates argue that special consideration and provisions are required for patients who are non-comprehending (**Ratschen 2008 [England, BHS, MHS, MMS+]**), for example additional staff resources to escort and provide surveillance in outdoor areas (**Karan 1993 [USA, MHS, CS-]**), and that in some extreme situations exemptions are necessary as a measure to alleviate patient distress (**Mental Health Foundation 2009 [England, MHS, SCSS+]**).

Concerns are also expressed about the legality of removing the right to smoke from patients who have been sectioned or detained against their will. The related evidence is described under Section 2.1, 'Attitudes to smoking as a rights issue'.

Quantitative findings

No quantitative evidence was identified relating to this theme.

2.5.3 Patients with other addictive disorders

Qualitative findings

Staff treating patients for addictive disorders expressed concern that trying to abstain from or stop smoking whilst simultaneously giving up other substances or forms of chemical dependence to comply with smokefree can have a negative impact on their recovery (**Jessup 2007 [USA, MHS, QS++]**; **Karan 1993 [USA, MHS, CS-]**), with, for example, staff efforts diverted from treatment to enforcement (**Kotz 1993 [USA, MHS, CS-]**). Findings suggest that such concerns can be promulgated by patient mentors or 'sponsors' who are themselves smokers (**Jessup 2007 [USA, MHS, QS++]**) and that patients in this group can have low motivation to quit (**Karan 1993 [USA, MHS, CS-]**) and may acquiesce to tobacco cessation support in order to gain access to a drug treatment programme (**Karan 1993 [USA, MHS, CS-]**).

Findings suggest that consideration also needs to be extended to the friends and relatives of patients with addictive disorders. **Kotz et al (1993, [USA, MHS, CS-])** found that family members can persist in supplying patients with tobacco and resist efforts to stop patients smoking because they are reluctant for their relative to be distracted from recovery from an addiction to another drug which has more immediate and severe adverse consequences.

Quantitative findings

Hill et al (2007 [England, MHS, SCSS++]) in their investigation of patients and staff attitudes towards a proposed indoor smoking ban in an English inpatient drug and alcohol dependence treatment unit found that the majority of staff (97%) believed that patients would find treatment more difficult, and 87% of staff believed that treatment would be less successful. The study also found that the majority of patients (92%) believed that treatment for drug and/or alcohol dependence with a no-smoking policy would be more difficult, and 71% of patients felt that treatment would be less successful.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Mental health patient groups identified as requiring special consideration when devising smokefree policy

Evidence statement:

2.31 **Barrier: belief that some mental health patients require special consideration and support.** Eleven studies (seven UK, four non-UK) identified specific types of mental health patient as requiring special consideration and potential exemption status from smokefree policy: long-stay psychiatric patients receiving continuing care who may regard the mental health facility as their home (**McNeill 2007 [Scotland, MHS, QS+]**; **HUG 2007 [Scotland, MHS, QS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2010 [England, MHS, QS++]**]; cognitively impaired and acutely ill psychiatric patients who have limited capacity to understand and to retain the information surrounding the policy and who can be disruptive and present an increase risk to staff (**McNeill 2007 [Scotland, MHS, QS+]**; **Campion 2008 [Australia, MHS, QS+]**; **Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Pritchard 2008 [England, MHS, QS++]**; **Ratschen 2008 [England, BHS, MHS, MMS+]**; **Karan 1993 [USA, MHS, CS-]);** and patients being treated for other addictive disorders who may find stopping smoking whilst simultaneously giving up other substances interferes with their treatment and recovery (**Jessup 2007 [USA, MHS, QS++]**; **Karan 1993 [USA, MHS, CS-]**; **Kotz 1993 [USA, MHS, CS-]; Hill 2007 [England, MHS, SCSS++]**).

Of the 11 studies reported the majority, seven, were conducted within the UK (**McNeill 2007 [Scotland, MHS, QS+]**; **HUG 2007 [Scotland, MHS, QS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2010 [England, MHS, QS++]**; **Ratschen 2008 [England, BHS, MHS, MMS+]**; **Hill 2007 [England, MHS, SCSS++]**) and one was conducted in a country judge to have similar applicability to the UK (**Campion 2008 [Australia, MHS, QS+]**).

Q3: What are the adverse events and other consequences associated with smokefree policies?

Views on adverse events and consequences were wide ranging and were grouped under ten themes: impact on patient mental health; impact on patient physical health; stimulating patient abuse and aggression; impact on the therapeutic environment and the patient-carer relationship; issues emerging from changing staff work break patterns; impact on medication requirements; impact on patient recruitment and retention; increased fire hazard risk; security and safety concerns; and impact on the physical environment. Brief summaries of the studies used to answer this research question are given in **Figure 4**.

Figure 4: Question 3 study summaries

Qualitative evidence only

Campion 2008 [Australia, MHS, QS+] reported on the introduction, trial and termination of a smokefree policy in an acute mental health inpatient unit. Individual and group interviews were carried out with 6 key informants, and analysis of documentation related to implementation of the smokefree policy was carried out.

Cooke 1991 [Canada, MHS, CS-] reports a personal account of the implementation of an indoor smoking ban at a 20 bed psychiatric unit in a regional general hospital by the clinical nurse specialist manager of the unit.
HUG 2007 [Scotland, MHS, QS-] reported on the findings of 13 branch discussion meetings of a network of people who use or have used mental health services in the Scottish Highlands: Highland Users Group (HUG). The meetings involved 85 people, and explored participants' views on the possibility of psychiatric hospitals becoming smokefree.

Jessup 2007 [USA, MHS, QS++] explored the implementation of a smokefree policy requiring total abstinence from tobacco at a residential drug abuse treatment facility for pregnant and post-partum women. All staff were invited to take part in an interview. Those who took part in interviews (n=8) also took part in a focus group discussion.

Johnson 2010 [Canada, MHS, QS++] carried out a discourse analysis of healthcare providers' engagement in tobacco control in community mental health settings. Ninety-one healthcare providers (42 professionals and 49 paraprofessionals) across 6 study locations including 2 mental health housing units participated in open-ended interviews in which they described their role in tobacco control.

Karan 1993 [USA, MHS, CS-] report on the introduction and subsequent termination of a smokefree policy, requiring patient tobacco abstinence, at an inpatient substance abuse inpatient unit for patients with late stage addictions requiring intensive support.

Kotz 1993 [USA, MHS, CS-] reported on the implementation of an indoor smoking ban at an independent/private 20 bed chemical dependency unit in a 1000 bed tertiary care hospital.

McNeil 2007 (case studies, interviews, observation, Scotland +) explored the move towards mental health settings becoming smokefree in Scotland. The study consisted of interviews with professionals involved in managing, delivering or supporting mental health services in Scotland (n=11). In addition, observational visits were carried out to 4 UK NHS sites/hospitals, and the information gathered from these was presented as case studies.

Mental Health Foundation 2009 [England, MHS, SCSS+] explored the impact of smokefree legislation in English psychiatric units. A questionnaire survey was circulated around UK psychiatric units 5 months after the legislation came into force, and responses were received from 100 English NHS units and 9 independent sector units. Open-ended responses to the questionnaire were reported.

Parle 2004 [Canada, MHS, CS-] report on the implementation of a total smoking ban, including grounds, at a 291 bed psychiatric hospital spread over 225 acres incorporating a large maximum secure unit.

Patterson 2008 [Canada, BHS, QS++] carried out an ethnographic study of security staff (n=19) involved in enforcing an indoor smoking ban at a large hospital. The study consisted of participant observations, and 30 min-1 hour participant interviews.

Pritchard 2008 [England, MHS, QS++] evaluated the impact of a smokefree policy covering buildings and grounds within a mental health Trust. Purposive sampling was used to recruit 19 participants from a range of settings involved in implementation to take part in short interviews, including patient advocates, nursing staff and consultants.

Ratschen 2009a [England, MHS, QS++] explored the implementation of a smokefree policy in 2 adult inpatient mental health wards in an acute mental health Trust. Interviews were carried out with a stratified purposive sample of 16 medical and non-medical staff.

Schultz 2011 [Canada, BHS, QS++] carried out a mixed methods ethnographic study to explore the consequences of smokefree policy in two acute care teaching hospitals that had implemented smokefree property policies 3 years previously. A total of 82 inpatients, 9 key policy makers and 14 support staff were interviewed. Sixteen focus groups were held with healthcare providers and ward staff (n=81). In addition, researchers carried out 6 hour observations at each site.

Tillgren 1998 [Sweden, BHS, QS-] evaluated the implementation of an indoor smoking ban in a large university hospital. Four years after implementation of the ban, interviews were carried out with non-healthcare staff at the hospital: gardeners (n=5), cleaners (n=5), and hosts/hostesses (n=5).

Wareing 2012 [England, MHS, QS+] explored the implementation of smokefree legislation in English mental health services. Observational visits to 28 units were carried out. These were drawn from a cross section of responses to a questionnaire on compliance that had been distributed to a broad range of mental health facilities across England. The selected units represented those who reported good practice, those who reported problems, and some who had not responded to the compliance questionnaire.

Qualitative and quantitative evidence

Arack 2009 [England, BHS, SCSS-] conducted a survey to explore the effect of a complete smoking ban at an NHS Trust, focusing on staff attitudes, staff compliance, and staff smoking behaviour. The survey took place 17 months after implementation of the ban. A total of 160 staff were recruited to take part in the survey through opportunity sampling. Outcome measures were support for smoking ban, and opinions about enforcement of the ban. Thematic analysis was used to identify the main themes emerging from responses to the survey's open-ended questions.

Fitzpatrick 2009 [Ireland, BHS, MMS+] carried out a survey of staff and patient attitudes at an acute general hospital with an indoor ban in place, and plans to transition to a complete campus-wide ban. A total of 295 patients and 225 staff took part in the study. The relevant attitudinal result was support for the planned introduction of a campus-wide ban. In addition, short 5-15 minute attitudinal interviews were conducted with smoking patients (n=28) and staff (n=30).

Sheffer 2009 [USA, BHS, BAS+] explored the attitudes and beliefs of hospital CEOs (Chief Executive Officers)/administrators in one US State towards smokefree legislation 6 months before (n=84) and 1 year after (n=68) legislation became effective. The surveys assessed support for the legislation, support for and resistance to smokefree anticipated/experienced from stakeholders (staff, patients, visitors etc.), and views about the challenges of implementing the legislation. The surveys included a number of open-ended questions.

Ratschen 2008 [England, BHS, MHS, MMS+] explored the impact and challenges of implementation of smokefree policy in NHS acute and mental health Trusts. Questionnaire based surveys were sent to all NHS acute and mental health Trusts, of which representatives from 186 Trusts completed questionnaires (72 mental health trusts and 114 Acute Trusts). At the time of the survey, the majority of Trusts had implemented smokefree policies. Relevant attitudinal results included: views about experience of staff support; views about the effect of smokefree on patient mental health (mental health settings only); beliefs about the effect of smokefree on patient medication needs (mental health settings only); views about the effect of smokefree policies on the staff-patient relationship; views about enforcement and compliance. Questionnaires were supplemented with semi-structured telephone interviews with 22 respondents and direct observation at a sample of 15 Trusts (22 different sites).

Wheeler 2007 [USA, BHS, MMS-] evaluated the impact of a total smoking ban at a university hospital (site 1), and an employee smoking ban at a private children's hospital on the hospital campus (site 2). Staff were surveyed at site 1 three months before implementation of the ban (n=842) and 10 months after implementation (n=912). Staff were surveyed at site 2 two months after implementation of the staff smoking ban (n=183). The surveys assessed: support for policy; belief that the policy would make/made the site healthier and safer; belief that the policy would set/set a good example for patients. In addition, focus group discussions were conducted with supervisors (n=7) and security personnel (n=4), and key informant interviews were carried out with hospital administrators (n=8) at site 1 after implementation of the ban.

Quantitative evidence only

Cormac 2010 [England, MHS, BAS+] evaluated the impact of a total smoking ban in a high security long-stay psychiatric hospital. Postal surveys of staff were conducted at two time points: 1 pre-implementation (n=1038), and 1 post-implementation (n=670). Relevant outcome measures were support for the ban, beliefs about the effect of the ban on patient aggression and patient management, beliefs about the effect of the ban on patient medication needs. Postal surveys of patients were conducted at two time points: 1 pre-implementation (n=175), and 1 post-implementation (n=115). Relevant outcome measures were support for ban, and beliefs about the effect of the ban on patient and physical and mental health.

Haller 1996 [USA, MHS, BAS+] studied the effects of a complete smoking ban in a locked psychiatric unit. Staff and patients were surveyed 1 month before implementation (staff n=67; patients n=21). Staff were also surveyed 1 month after

implementation (n=53), and patients were surveyed 2-4 months after implementation (n=93). The survey measured attitudes towards the ban, and its perceived impact on patients and the ward.

Hill 2007 [England, MHS, SCSS++] investigated the attitudes of patients (n=38) and staff (n=39) on an in-patient drug and alcohol dependence treatment unit towards a proposed indoor smoking ban. The relevant attitudinal results were beliefs about the willingness of patients to accept treatment in a smokefree facility, beliefs about the difficulty of treatment in a smokefree environment, and beliefs about the success of treatment in a smokefree environment.

Praveen 2009 [England, MHS, SCSS+] explored staff (n=308) attitudes towards an impending indoor smoking ban at three in-patient mental health units. Relevant attitudinal results were staff views about where staff and patients should be allowed to smoke, beliefs about whether staff should be allowed to smoke with patients, and beliefs about the effects of smokefree on patient mental and physical health.

Ratschen 2009b [UK, MHS, SCSS++] explored staff attitudes to smokefree policy in 25 inpatient mental health units of an NHS Mental Health Trust with a smokefree policy in place. A total of 459 staff completed a questionnaire survey designed to assess beliefs about the importance of addressing smoking in mental health settings, views about compliance and enforcement, and beliefs about smoking and mental health.

Shipley 2008 [England, BHS, SCSS+] explored staff views about enforcement of smokefree policy at a general hospital with a smokefree policy in place. A total of 85 staff were recruited through convenience sampling. Staff were asked whether they would challenge patients, other staff members or visitors for smoking on the hospital sites, and the study explored the reasons given by staff who said they would not do so.

Steiner 1991 [USA, MHS, BAS+] assessed staff and patient attitudes towards smokefree policy at a mental health day hospital. Surveys were carried out 1 week prior to a move to new smokefree premises (n=17 patients; n=15 staff), and two weeks after the move (n=15 patients; n=17 staff). The surveys assessed staff and patient support for the policy, and beliefs about the effect of the move to a smokefree facility on patient mental health.

Voci 2010 [Canada, MHS, RCSS++] explored staff attitudes towards and experiences of implementation of an indoor and partial-outdoor smoking ban at a centre for mental health and addiction at two time points after policy implementation: 2-7 months after implementation (n=430); and 31-33 months after implementation (n=400). The surveys assessed: support for the policy; beliefs about the beneficial effects of smokefree policy on the hospital environment; views about the right to smoke/right to be protected from second hand smoke; beliefs about the effect of smokefree policy on patient mental and physical health; beliefs about the effect of smokefree policy on patient aggression and patient management; beliefs about the effects of the policy on patient medication needs; beliefs about the effect of the policy on safety; and beliefs about the effect of the policy on patient retention.

Wye 2010 [Australia, MHS, SCSS++] explored staff attitudes towards an impending total smoking ban at a psychiatric inpatient hospital. A total of 183 staff were surveyed 2 weeks before the ban was due to be implemented. As well as assessing staff support for the ban, the survey assessed beliefs about the potential effects of the ban on: patient physical health; patient mental health; patient management and patient aggression; patient medication needs; staff working conditions; patient quality of life; quality of care; staff workload; rapport between patients; and hospital safety. The study also explored clinician views about perceived barriers to implementation of the policy.

3.1 Impact on patient mental health

Qualitative findings

Studies conducted in mental health settings suggest that smoking is sometimes seen by staff as having a calming effect, providing relief from and helping patients cope with the symptoms associated with mental illness (**Johnson 2010[Canada, MHS, QS++]**), while the withdrawal of tobacco is seen to risk exacerbating these symptoms (**Johnson 2010 [Canada, MHS, QS++]; Parle 2004 [Canada, MHS, CS-]**). A recent survey of mental health units in England found mental health staff to lack knowledge about the effect of smoking and appreciation of its interaction with mental health conditions (**Wareing 2012 [England, MHS, QS+]**).

Quantitative findings

Several studies, all of which covered mental health settings, reported on patient and staff views about the effects of smokefree on patient mental health (**Cormac 2010 [England, MHS, BAS+]**; **Haller 1996 [USA, MHS, BAS+]**; **Praveen 2009 [England, MHS, SCSS+]**; **Ratschen 2008 [England, BHS, MHS, MMS+]**; **Ratschen 2009b [UK, MHS, SCSS++]; Steiner 1991 [USA, MHS, BAS+]**; **Voci 2010 [Canada, MHS, RCSS++]**; **Wye 2010 [Australia, MHS, SCSS++]**).

These studies suggest that smoking is widely viewed as a coping mechanism for mental health patients, and there is a widespread belief that the removal of smoking has an adverse effect on patient mental health. In their survey of staff before implementation of smokefree policy, **Praveen et al (2009 [England, MHS, SCSS+];)** found that 79% of respondents believed patients would become more agitated or deteriorate in their mental health if they are not allowed to smoke, and only 15% of staff believed that patient mental health would improve as a result of the ban.

Ratschen et al (2009b [UK, MHS, SCSS++])reported that 65% of staff (including medical and non-medical) who participated in their survey believed that smoking was an important coping mechanism for patients. In addition, **Wye et al (2010 [Australia, MHS, SCSS++])** reported that 59% of psychiatric hospital staff disagreed with the statement that 'a total smoking ban will make patients happier', and only 29% agreed that a ban would improve patient mental health.

However, attitudinal findings indicate that the adverse effects of smokefree on patient mental health may not be as great as anticipated. **Cormac et al (2010 [England, MHS, BAS+])** reported that before smokefree policy was implemented in a psychiatric hospital in England, 53% of patients believed that it would have an adverse effect on patient mental health, however post-implementation only 39% believed that this had been the case. **Ratschen et al's (2008 [England, BHS, MHS, MMS+])** postal survey of English NHS acute trusts and mental health units revealed that only 17% of Trust representatives from the mental health settings believed that aggravation of mental health problems had posed problems in the implementation of smokefree policy. **Haller et al (1996 [USA, MHS, BAS+])** reported that staff in a locked inpatient unit were significantly less concerned about patients being 'too fragile' to cope with smoking withdrawal after the ban than they were before implementation of the ban ($p<0.05$).
Voci et al's (2010 [Canada, MHS, RCSS++]**)** surveys of staff in a Canadian mental health and addictions facility revealed that the average level of agreement with the statement that 'patients are more anxious' as a result of the implementation of smokefree was between 'neutral' and 'somewhat agree' in the first two surveys post-implementation, and between 'somewhat disagree' and 'neutral' in the third survey after policy implementation (scale: strongly disagree/somewhat disagree/neutral/somewhat agree/strongly agree). However, this change was not significant ($p>0.05$).

Steiner et al (1991 [USA, MHS, BAS+]) reported that only a third of staff (33%) at a psychiatric day hospital believed that the move to a smokefree facility had a negative emotional impact on patients, with the majority of staff (59%) surprised by the positive response of patients. Similarly, 75% of patients were surprised at how smooth the transition had been, although 69% of patients also believed the move had resulted in a negative emotional impact on some of their fellow patients (e.g. nervousness).

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Impact on patient mental health

Evidence statement:

3.1 Barrier: belief that smokefree policy would adversely affect psychiatric patients' mental health. Two studies (one UK, one non-UK) found that staff expected smokefree policy to have a negative impact on patient mental health (**Praveen 2009 [England, MHS, SCSS+]**; **Wye 2010 [Australia, MHS, SCSS++]**) while two other Canadian studies found that withdrawal of tobacco was believed to risk exacerbating the symptoms of mental illness (**Johnson 2010 [Canada, MHS, QS++]; Parle 2004 [Canada, MHS, CS-]**). Four studies (one UK, three non-UK) found that beliefs about these adverse effects had diminished following implementation of the policy or that the effects were not believed to be as significant as had been anticipated (**Cormac 2010 [England, MHS, BAS+]; Haller 1996 [USA, MHS, BAS+]; Voci 2010 [Canada, MHS, RCSS++]; Steiner 1991 [USA, MHS, BAS+]**).

Of the eight studies reported only two were conducted in the UK (**Praveen 2009 [England, MHS, SCSS+]; Cormac 2010 [England, MHS, BAS+]**) and one was judged to have similar applicability to the UK (**Wye 2010 [Australia, MHS, SCSS++]**).

3.2 Impact on patient physical health

Qualitative findings

No qualitative evidence was identified relating to this theme

Quantitative findings

Three studies, all from mental health settings, reported on beliefs about the effects of smokefree on patient physical health (**Cormac 2010 [England, MHS, BAS+]**; **Praveen 2009 [England, MHS, SCSS+]**; **Wye 2010 [Australia, MHS, SCSS++]**).

Praveen et al (2009 [England, MHS, SCSS+];) reported that 64% of staff believed that patient physical health would benefit as a result of implementation of a ban on smoking, and **Wye et al (2010 [Australia, MHS, SCSS++])** reported that 65% of staff agreed that a total smoking ban would improve patient physical health. These studies suggest that staff acknowledge the physical health benefits of smokefree environments. However, **Cormac et al (2010 [England, MHS, BAS+])** reported that a quarter of patients (27%) surveyed in an English psychiatric hospital believed that smokefree policy would adversely affect patient physical health. This remained unchanged after implementation of the policy (25%).

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Impact on patient physical health

Evidence statement:

3.2 Inconclusive: belief that smokefree policy would be beneficial to psychiatric patients' physical health. Two studies (one UK, one non-UK) found that mental health staff believed smokefree policy would benefit patients physical health (**Praveen 2009 [England, MHS, SCSS+]**; **Wye 2010 [Australia, MHS, SCSS++]**), while one UK study reported that psychiatric patients believed it would adversely affect patient physical health, a belief that remained unchanged after implementation (**Cormac 2010 [England, MHS, BAS+]**).

Of the three studies reported two were conducted in the UK (**Praveen 2009 [England, MHS, SCSS+]**; **Cormac 2010 [England, MHS, BAS+]**) and one was conducted in a country judged to be applicable to the UK (**Wye 2010 [Australia, MHS, SCSS++]**).

3.3 Stimulating patient abuse and aggression

Qualitative findings

There was a fear amongst staff, particularly in the mental health settings, that enforcing smokefree policy could be a potential source of conflict, where informing clients that they cannot smoke could cause aggression and an increased risk of assault and injury (**Arack 2009 [England, BHS, SCSS-]**; **Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]; Campion 2008 [Australia, MHS, QS+]**), and create tension and stress in the workplace (**Campion 2008 [Australia, MHS, QS+]; Karan 1993 [USA, MHS, CS-]**). These views were echoed by mental health patient groups (**HUG 2007 [Scotland, MHS, QS-]**).

Staff report opting not to enforce smokefree policy for fear of escalating potentially difficult situations (**Ratschen 2009a [England, MHS, QS++]**). Staff who had experience of similar bans in other settings helped to allay some of the fears by suggesting that such fears were not necessarily justified (**McNeill 2007 [Scotland, MHS, QS+]**). In some cases these fears had not be borne out following the introduction of a smokefree policy (**Wheeler 2007 [USA, BHS, MMS-]; Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]**; **Cooke 1991 [Canada, MHS, CS-]; Parle 2004 [Canada, MHS, CS-]**). However, in others an increase in incidents related to the introduction of the smokefree policy were reported (**Mental Health Foundation 2009 [England, MHS, SCSS+]; Ratschen 2009a [England, MHS, QS++]**), although these could be restricted to lower level effects such as verbal abuse (**Pritchard 2008 [England, MHS, QS++]**). In some cases the effect was less clear or unproven (**Campion 2008 [Australia, MHS, QS+]**). The apparent absence of robust systems for monitoring such incidents could limit ability to assess for these effects (**Campion 2008 [Australia, MHS, QS+]; Parle 2004 [Canada, MHS, CS-]; Pritchard 2008 [England, MHS, QS++]**).

Quantitative findings

Four studies reported on staff beliefs about the effects of smokefree policy on patient aggression and patient management issues, three in a mental health setting (**Cormac 2010 [England, MHS, BAS+]**; **Voci 2010 [Canada, MHS, RCSS++]**; **Wye 2010 [Australia, MHS, SCSS++]**) and one in a general

hospital (**Shipley 2008 [England, BHS, SCSS+]**). No studies were identified that reported on patient beliefs about the same issue.

The quantitative studies included in the review suggest that there is a belief that implementation of smokefree policies in mental health settings will result in patient aggression and difficulties in patient management. **Wye et al (2010 [Australia, MHS, SCSS++])** reported that 60% of psychiatric hospital staff surveyed before implementation of a total smoking ban disagreed that the ban would decrease patient aggression, and 31% were uncertain. In addition, 89% of clinicians believed that fear of patient aggression was a barrier to successful implementation of a smoking ban.

One quantitative study in England compared beliefs about the effects of smokefree on patient aggression in the mental health setting before and after implementation (**Cormac 2010 [England, MHS, BAS+]**). Before implementation of the smokefree policy, 55% of staff believed that patients would be more aggressive, compared to only 15% of staff who believed that patients had been more aggressive after implementation of the ban.

Voci et al (2010 [Canada, MHS, RCSS++]) conducted a series of three staff surveys after the implementation of an indoor smoking ban in a Canadian mental health and addictions facility. The surveys revealed that the average level of agreement across all surveys with all of the following statements was between 'somewhat disagree' and 'neutral' (scale: strongly disagree/somewhat disagree/neutral/somewhat agree/strongly agree): there is an increased number of physical assaults/aggression; there is an increased number of seclusions; there is an increased number of physical restraints. The average level of agreement with the statement 'there is an increased number of verbal assaults/aggression' increased across the surveys, with agreement between 'somewhat disagree' and 'neutral', in the initial surveys rising to between 'neutral' and 'somewhat agree' in the later survey.

Shipley et al (2008 [England, BHS, SCSS+]) found that, of staff who had not challenged patients, staff or visitors for smoking on the district general hospital site and who were not prepared to do so, the most commonly cited reason was fear of aggression.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

<u>Stimulating patient abuse and aggression</u>

Evidence statements:

3.3 Barrier: belief that enforcement of smokefree policy would result in abuse and aggression. Seven studies (five UK, two non-UK), four conducted in mental health settings and three in broader secondary care settings, reported concerns that enforcing smokefree policy is a potential source of conflict, and could result in abuse and increased risk of assault (**Arack 2009 [England, BHS, SCSS-]**; **Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]; Campion 2008 [Australia, MHS, QS+]; HUG 2007 [Scotland, MHS, QS-]; Wye 2010 [Australia, MHS, SCSS++]; Shipley 2008 [England, BHS, SCSS+]**). Two UK studies, one conducted in a mental health setting and the other in a broader secondary care setting, reported cases where staff specifically reported not enforcing the policy for fear of conflict (**Ratschen 2009a [England, MHS, QS++]**; **Shipley 2008 [England, BHS, SCSS+]**).

3.4 Barrier: cases of abuse and aggression can be a feature of implementation but often not at

the frequency or severity anticipated. Five qualitative studies (two UK, three non-UK), four conducted in a mental health setting and one in a broader secondary care setting, reported that fear of abuse and aggression were not realised following the introduction of a smokefree policy (**Wheeler 2007 [USA, BHS, MMS-]; Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]**; **Cooke 1991 [Canada, MHS, CS-]; Parle 2004 [Canada, MHS, CS-]**). Three UK studies conducted in mental health settings reported an increase in incidents related to the introduction of the smokefree policy (**Mental Health Foundation 2009 [England, MHS, SCSS+]; Ratschen 2009a [England, MHS, QS++]; Pritchard 2008 [England, MHS, QS++]**]. However, one of these studies indicated that these changes were restricted to lower level effects such as verbal abuse (**Pritchard 2008 [England, MHS, QS++]**). Similarly, of the two quantitative studies that assessed changes over time for this issue, both of which were conducted in mental health settings, one UK study reported significantly lower numbers of staff expressing concerns after implementation compared to before implementation of the policy (**Cormac 2010 [England, MHS, BAS+]**). The other quantitative study (non-UK) found that while there was agreement that verbal assaults and aggression had increased after implementation there was general disagreement that other more serious incidents such as physical assaults had increased (**Voci 2010 [Canada, MHS, RCSS++]**).

Of the 15 studies reported the majority, nine, were conducted within the UK (**Arack 2009 [England, BHS, SCSS-]**; **Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]; HUG 2007 [Scotland, MHS, QS-]; Shipley 2008 [England, BHS, SCSS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Ratschen 2009a [England, MHS, QS++]; Pritchard 2008 [England, MHS, QS++]; Cormac 2010 [England, MHS, BAS+]**) and two studies were conducted in a country judged to be of similar applicability to the UK (**Campion 2008 [Australia, MHS, QS+]; Wye 2010 [Australia, MHS, SCSS++]**).

3.4 Impact on the patient-carer relationship and therapeutic environment

Qualitative findings

In mental health settings smoking is traditionally seen as a shared activity, where smoking with clients can function as a therapeutic tool, acting as a conduit for relationship building and an opportunity for information sharing (**McNeill 2007 [Scotland, MHS, QS+]; Johnson 2010 [Canada, MHS, QS++]**). In some cases cigarettes have been used by staff to help patients relax and as a bargaining mechanism to help alleviate agitation and distress and to diffuse difficult situations (**Patterson 2008 [Canada, BHS, QS++]; McNeill 2007 [Scotland, MHS, QS+]; Campion 2008 [Australia, MHS, QS+]; Johnson 2010 [Canada, MHS, QS++]**), and in one case the threat of withdrawal of cigarettes is reported as being used as an incentive to good behaviour (**Wareing 2012 [England, MHS, QS+]**).

Viewed within this context the introduction of smokefree policies in mental health settings and requirement by healthcare staff to enforce the policy is seen to have a detrimental effect on the therapeutic environment, for example, creating agitation and an unhealthy fixation on outside smoking areas and break times (**Ratschen 2009a [England, MHS, QS++]**; **Wareing 2012 [England, MHS, QS+]; Kotz 1993 [USA, MHS, CS-]**) and causing patients to become less socially interactive as they retreat to private spaces such as bathrooms to smoke (**Kotz 1993 [USA, MHS, CS-]**). Similarly, introduction of smokefree polices and the onus placed on healthcare staff to police these polices have also been seen to conflict with attempts to build trusting therapeutic relationships (**McNeill 2007 [Scotland, MHS, QS+]; Campion 2008 [Australia, MHS, QS+]; Karan 1993 [USA, MHS, CS-];**

Kotz 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2009a [England, MHS, QS++]). In some cases these concerns have discouraged healthcare staff from enforcing the rules in order to maintain a good therapeutic relationship (**Mental Health Foundation 2009 [England, MHS, SCSS+]**) and in one case were instrumental in the decision to discontinue a policy which proved unenforceable (**Kotz 1993 [USA, MHS, CS-]**).

There are fewer reported positive effects on the patient-carer relationships and therapeutic environment. However, one study reported that escorting patients to outside areas as part of the enforcement regime can provide new opportunities to interact with patients (**Pritchard 2008 [England, MHS, QS++]**) while another reported that new recreational spaces created from former smoking rooms can have a positive impact on patient behaviour and sense of well-being (**Ratschen 2008 [England, BHS, MHS, MMS+]**).

Quantitative findings

Two quantitative studies considered staff beliefs around smoking with patients and the staff-patient relationship. The findings from these appear to support those to emerge from the qualitative studies.

Ratschen et al (2008 [England, BHS, MHS, MMS+]) in their study of NHS acute and mental health Trusts found that 36% of staff from acute and mental health Trusts from across England believed that adverse effects of smokefree policy on clinician-patient relationships had posed difficulties in implementation.

In addition, **Praveen et al (2009 [England, MHS, SCSS+])** reported that staff who smoke were more likely to believe that that there are benefits to staff smoking with service users when compared with staff who were non-smokers (65% versus 30% respectively) and that staff should be allowed to smoke with service users when compared with staff who were non-smokers (42% versus 24%,, respectively). However, the authors did not report whether this finding was significant. These findings appear to suggest that staff who smoke are more likely to recognise benefits to the therapeutic relationship of smoking with patients.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Impact on the patient-carer relationship and the therapeutic environment

Evidence statements:

3.5 **Barrier: belief that smokefree policies were damaging to the patient-carer relationship and the therapeutic environment.** Eight studies (five UK, three non-UK), seven of which were conducted in mental health settings and one in a broader secondary care setting, reported a belief amongst healthcare staff that policing and enforcing smokefree policy was detrimental to establishing therapeutic relationships with patients (**McNeill 2007 [Scotland, MHS, QS+]; Campion 2008 [Australia, MHS, QS+]; Karan 1993 [USA, MHS, CS-]; Kotz 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2009a [England, MHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+])**. One UK study conducted in a mental health setting found that staff who smoked were more likely to believe that there were therapeutic benefits to staff smoking with patients than staff who were non-smokers (**Praveen 2009 [England, MHS, SCSS+]**). Three studies (two UK, one non-UK), all conducted in mental health settings, found that smokefree

policies could be detrimental to establishing a positive therapeutic environment (**Ratschen 2009a [England, MHS, QS++]**; **Wareing 2012 [England, MHS, QS+]; Kotz 1993 [USA, MHS, CS-])**.

3.6 Facilitator: belief that smokefree policies can make positive contributions to the patient-carer relationships and therapeutic environment. One UK mental health study reported that escorting patients to outside areas to smoke can provide new opportunities to interact with patients [**Pritchard 2008 [England, MHS, QS++]**], while another UK study conducted in broader secondary care settings reported that new recreational spaces created from former smoking rooms can have a positive impact on patient behaviour and sense of well-being (**Ratschen 2008 [England, BHS, MHS, MMS+]**).

Of the 10 studies reported the majority, seven, were conducted within the UK (**McNeill 2007 [Scotland, MHS, QS+]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2009a [England, MHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+]; Praveen 2009 [England, MHS, SCSS+]; Wareing 2012 [England, MHS, QS+]**) and one study was conducted in a country judged to be of similar applicability to the UK (**Campion 2008 [Australia, MHS, QS+]**).

3.5 Issues emerging from changing break patterns to accommodate smoking

Qualitative findings

Implementation of smokefree policy is reported to result in staff taking longer breaks in order to leave the grounds to smoke (**Arack 2009 [England, BHS, SCSS-]**) or taking extra breaks outside of official break times (**Ratschen 2008 [England, BHS, MHS, MMS+]; Wareing 2012 [England, MHS, QS+]**). Longer and more frequent smoking breaks can be a source of tension between smoking and non-smoking staff (**Arack 2009 [England, BHS, SCSS-]; Wareing 2012 [England, MHS, QS+]**). Other studies suggest non-smoking staff welcome plans for going completely smokefree because staff who smoke no longer require extra smoking breaks, resulting in greater equity in break patterns (**Schultz 2011 [Canada, BHS, QS++]; Sheffer 2009 [USA, BHS, BAS+]**).

Implementation of smokefree policies is reported to place extra demands on staff time and resources, to organise patient smoking breaks (**Wareing 2012 [England, MHS, QS+]**), to assist patients who require to leave the ward to smoke, particularly patients with mobility limitations and to find patients for treatment who leave wards unassisted (**Schultz 2011 [Canada, BHS, QS++]**). Polices are also reported to adversely affect healthcare delivery, with patients who leave wards to smoke unassisted sometimes not being available for treatment when required (**Schultz 2011 [Canada, BHS, QS++]**) and the introduction of regular smoking breaks disrupting therapeutic activities (**Wareing 2012 [England, MHS, QS+]**).

Quantitative findings

No quantitative evidence was identified relating to this theme

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Issues emerging from changing break patterns to accommodate smoking

Evidence statements:

3.7 Inconclusive: belief that smokefree policy leads to longer staff breaks and tension between smoking and non-smoking staff. Three UK studies, one conducted in a mental health setting and two in broader secondary care settings, suggest that smokefree policy leads to staff who are smokers taking more break time (**Arack 2009 [England, BHS, SCSS-]**; **Ratschen 2008 [England, BHS, MHS, MMS+]; Wareing 2012 [England, MHS, QS+]**). Two of these studies also report that these changes can lead to tension between smoking and non-smoking staff (**Arack 2009 [England, BHS, SCSS-]; Wareing 2012 [England, MHS, QS+]).** Two non-UK studies studies, both conducted in broad secondary care settings, report that smokefree policy may lead to greater equity in break patterns (**Schultz 2011 [Canada, BHS, QS++]; Sheffer 2009 [USA, BHS, BAS+]**).

3.8 Barrier: belief that changing break patterns places extra demands on staff resources and disrupts healthcare delivery. Two studies (one UK, one non-UK), one conducted in a mental health setting and the other in a broader secondary care setting, report that the need to supervise patients smoking, places extra demands on staff time and resources and disrupts patient attendance for treatment and participation in therapeutic activity (**Schultz 2011 [Canada, BHS, QS++]; Wareing 2012 [England, MHS, QS+]**).

Three of the five studies reported were conducted within the UK (**Arack 2009 [England, BHS, SCSS-]**; **Ratschen 2008 [England, BHS, MHS, MMS+]; Wareing 2012 [England, MHS, QS+]**).

3.6 Impact on medication requirements

Qualitative findings

Two UK studies conducted in mental health settings identified a lack of understanding by nonmedical, healthcare staff about the interaction between stopping smoking and medication requirements, particularly dosage of antipsychotic medications which led to calls for better information for staff and improved monitoring and training (**McNeill 2007 [Scotland, MHS, QS+]**; **Ratschen 2009a [England, MHS, QS++]**). Reported inabilities of staff to distinguish between the symptoms of nicotine withdrawal and mental illness (**Ratschen 2009a [England, MHS, QS++]**) appears to add extra weight to such calls. One study conducted in a Canadian psychiatric unit reported that in practice the smokefree policy had not resulted in any increase in use of medication (**Cooke 1991 [Canada, MHS, CS-]**).

Quantitative findings

A number of studies examined beliefs about the impact of smokefree policy and use of medication. Two studies identified a concern among staff that implementation of smokefree policy would result in an increase in the amount of medication required by patients in mental health settings (**Cormac 2010 [England, MHS, BAS+]**; **Haller 1996 [USA, MHS, BAS+])** while one study conducted in an Australian psychiatric hospital before implementation of smokefree policy, reported that 56% of clinical staff disagreed that a smoking ban would reduce medication use **Wye et al (2010 [Australia, MHS, SCSS++])**.

Two of the studies suggest that these concerns may be exaggerated. **Cormac et al (2010 [England, MHS, BAS+])** reported that before implementation of smokefree, 46% of psychiatric hospital staff believed patients would need more medication as a result of the policy, compared with only 13% of staff surveyed after policy implementation who believed this had been the case (the authors did not report whether this finding was significant). **Haller et al (1996 [USA, MHS, BAS +])** reported that

compared with pre-implementation attitudes, psychiatric staff were significantly less concerned about patients requiring more medication after implementation of smokefree policy ($p<0.05$). The same study also found that patients felt significantly less strongly than they did before the ban that extra doses of psychiatric medications would be required, and that total medication doses would need to be increased ($p<0.05$).

In addition, **Voci et al's (2010 [Canada, MHS, RCSS++])** surveys of staff in a Canadian mental health and addictions facility conducted after implementation of a smokefree policy revealed that the average level of agreement with the statement that 'there is an increased use of PRN medications (excluding NRT)' was between 'neutral' and 'somewhat agree' (scale: strongly disagree/somewhat disagree/neutral/somewhat agree/strongly agree).

Finally, a recent survey of acute and mental health NHS trusts in England examined the impact of smokefree policy on use of antipsychotic medication **Ratschen et al (2008 [England, BHS, MHS, MMS +])**. It found that 34% of Trust representatives believed that problems related to assessing dosage of antipsychotic medication in the context of changed smoking behaviour posed difficulties for the implementation of smokefree polices.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Impact on medication requirements

Evidence statements:

3.9 **Barrier: lack of understanding about the interaction between stopping smoking and antipsychotic medication**. Three UK studies, two conducted in mental health settings and one in broader secondary care settings, reported a lack of understanding by staff about the interaction between stopping smoking and dose requirements for antipsychotic medications (**McNeill 2007 [Scotland, MHS, QS+]**; **Ratschen 2009a [England, MHS, QS++]**; **Ratschen 2008 [England, BHS, MHS, MMS+])**.

3.10 **Barrier: belief that smokefree policy has an adverse impact on the amount of medication required by patients.** Two studies (one UK, one non-UK), both conducted in mental health settings, reported that implementation of smokefree policy would result in an increase in the amount of medication required by mental health patients (**Cormac 2010 [England, MHS, BAS+]**; **Haller 1996 [USA, MHS, BAS+]**), while another study (non-UK), also conducted in a mental health setting, reported general disagreement that smokefree policy would reduce medication use (**Wye 2010 [Australia, MHS, SCSS++]**). However, of the two studies (one UK, one non-UK) that conducted post-implementation follow-up surveys, both found that increases in medication use were believed to be significantly less than had been anticipated (**Cormac 2010 [England, MHS, BAS+]**; **Haller 1996 [USA, MHS, BAS+]**). One further study (non-UK) conducted in a mental health setting found a marginal level of agreement that use of medication had increased following implementation of smokefree policy (**Voci 2010 [Canada, MHS, RCSS++]**), while another qualitative study (non-UK) conducted in a mental health setting reported that use of medication had not increased post-implementation (**Cooke 1991 [Canada, MHS, CS-]**).

Four of the eight studies reported were conducted in the UK (**McNeill 2007 [Scotland, MHS, QS+]**; **Ratschen 2009a [England, MHS, QS++]**; **Ratschen 2008 [England, BHS, MHS, MMS+]; Cormac 2010**

[England, MHS, BAS+]) and one study was conducted in a country judged to be of similar applicability to the UK (**Wye 2010 [Australia, MHS, SCSS++]**).

3.7 Impact on patient recruitment and retention

Qualitative findings

A number of studies have examined the impact of smokefree policy on patient recruitment and retention. Mental health staff expressed concern that implementation of smokefree policy can discourage clients who smoke from attending for outpatient appointments (**Campion 2008 [Australia, MHS, QS+]**), a view also echoed by some patients (**HUG 2007 [Scotland, MHS, QS-]**). However, experience indicates that any fall-off in attendance is relatively minor and short lived (**HUG 2007 [Scotland, MHS, QS-]**).

Staff and patients voice similar concerns for inpatient and residential mental health services, with smokefree policies resulting in patients refusing admission and discharging against medical advice (**HUG 2007 [Scotland, MHS, QS-]**; **Parle 2004 [Canada, MHS, CS-]**). Anecdotal observations by staff would in some cases appear to confirm such assertions (**McNeill 2007 [Scotland, MHS, QS+]**; **Karan 1993 [USA, MHS, CS-]**; **Kotz 1993 [USA, MHS, CS-]**) However, examination of patient records fails to support these effects (**Karan 1993 [USA, MHS, CS-]**; **Kotz 1993 [USA, MHS, CS-]**; **Parle 2004 [Canada, MHS, CS-]**), which in one case showed an increase in admissions post-implementation (**Kotz 1993 [USA, MHS, CS-]**). It is suggested that these contradictory data may be explained by strong observer bias and that harm associated with patient admission and retention effects are largely illusory (**Kotz 1993 [USA, MHS, CS-]**).

There are fewer reported instances of patient recruitment and retention concerns in broader secondary care settings. The evidence that does exist appears to follow a similar pattern to that in mental health services. In one US study conducted on two hospital campuses, prior to implementation of a smokefree policy administrative staff expressed concerns that it might deter patients from attending for treatment (**Wheeler 2007 [USA, BHS, MMS-]**). However, post implementation no negative consequences were reported, with unanimous agreement that the policy was 'a good thing'. The same study also recorded concerns that the smokefree policy could damage employee relations and increase staff turnover. However, again no negative consequences were reported (**Wheeler 2007 [USA, BHS, MMS-]**). A second US study, this time relating to the retention of staff employed on a residential drugs rehabilitation programme, reported that the programme lost no staff and no clients as a result of the smokefree policy change (**Jessup 2007 [USA, MHS, QS++]**).

Quantitative findings

Three studies, all of which were conducted in mental health settings, reported on beliefs about the effects of smokefree on patient recruitment and retention (**Haller 1996 [USA, MHS, BAS+]**; **Hill 2007 [England, MHS, SCSS++]**; **Voci 2010 [Canada, MHS, RCSS++]**).

The studies suggest that mental health staff believe that implementation of smokefree policy can result in problems with patient recruitment and retention of patients in treatment. In the only UK study of the three, **Hill et al (2007 [England, MHS, SCSS ++])**, reported that in their survey conducted in specialist substance abuse treatment wards before implementation of indoor smokefree policy, 63% of staff believed that patients would be unlikely to accept treatment if there was a no smoking policy. In the same study, 73% of smoking patients said they would be unlikely to accept treatment if there was a no-smoking policy. However, another study suggests that the effect of smokefree policy

on patient recruitment may not be as serious as some staff and patients fear (**Haller 1996 [USA, MHS, BAS+]**). **Haller et al (1996 [USA, MHS, BAS +])** reported that after implementation of smokefree policy, staff of an inpatient psychiatric unit were significantly less concerned about patients leaving the unit against medical advice and patient elopement than they were before implementation of the ban ($p<0.05$).

Voci et al's (2010 [Canada, MHS, RCSS++]**) [Canada, MHS, RCSS++]**series of staff surveys conducted in a Canadian mental health and addictions facility after the implementation of an indoor smoking ban revealed that the average level of agreement with the statements that 'there is an increased number of elopements' and 'there is an increase in discharges against medical advice' as a result of the implementation of smokefree were both between 'somewhat disagree' and 'neutral' (scale: strongly disagree/somewhat disagree/neutral/somewhat agree/strongly agree).

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Impact on patient recruitment and retention

Evidence statements:

3.11 Barrier: belief that smokefree policy discourages patients from attending for outpatient appointments. Two studies (one UK, one non-UK) conducted in mental health settings reported concerns by mental health staff and patients that implementing smokefree policy would discourage patients who smoke from attending for outpatient appointments (**Campion 2008 [Australia, MHS, QS+]**; **HUG 2007 [Scotland, MHS, QS-]**). However, patient experiences reported by one of these studies (UK) indicates that any fall-off in attendance to be short-term (**HUG 2007 [Scotland, MHS, QS-]**).

3.12 Barrier: belief that smokefree policy results in patients refusing admission and discharging against medical advice. Eight studies (three UK, five non-UK), seven of which were conducted in mental health settings and one in a broader secondary care setting, reported staff and patient concerns that the implementation of smokefree policy would result in patients refusing admission and treatment, and discharging against medical advice (**HUG 2007 [Scotland, MHS, QS-]**; **Parle 2004 [Canada, MHS, CS-]; McNeill 2007 [Scotland, MHS, QS+]**; **Karan 1993 [USA, MHS, CS-]; Kotz 1993 [USA, MHS, CS-]; Wheeler 2007 [USA, BHS, MMS-]**; **Haller 1996 [USA, MHS, BAS+]**; **Hill 2007 [England, MHS, SCSS++]**). However, in three cases (all non-UK), all relating to mental health settings, examination of patient records failed to indicate any negative impact (**Karan 1993 [USA, MHS, CS-]**; **Kotz 1993 [USA, MHS, CS-]**; **Parle 2004 [Canada, MHS, CS-]**). In three of these cases (one UK, two non-UK), again all relating to mental health settings, staff observations post-implementation were consistent with prior concerns that smokefree policy would have a negative impact on patient retention (**McNeill 2007 [Scotland, MHS, QS+]**; **Karan 1993 [USA, MHS, CS-]; Kotz 1993 [USA, MHS, CS-])**, while in two other cases (both non-UK), one conducted in a mental health setting and the other a broader secondary care setting, concerns about negative impact on patient retention were significantly reduced or no longer existed (**Haller 1996 [USA, MHS, BAS+]**; **Wheeler 2007 [USA, BHS, MMS-]**). One other mental health study (non-UK) found a marginal level of disagreement with statements that elopements' and discharges against medical advice had increased as a result of the smokefree policy (**Voci 2010 [Canada, MHS, RCSS++]**).

Of the 10 studies reported only three were conducted in the UK (**HUG 2007 [Scotland, MHS, QS-]**;

McNeill 2007 [Scotland, MHS, QS+]; **Hill 2007 [England, MHS, SCSS++]**) and one was conducted in a country judged to be of similar applicability to the UK (**Campion 2008 [Australia, MHS, QS+]**).

3.8 Increased fire hazard risk

Qualitative findings

In mental health settings there was a widespread belief that clandestine smoking in unsupervised areas such a patient bedrooms and bathrooms constitutes an enhanced fire hazard risk (**Ratschen 2008 [England, BHS, MHS, MMS+]**; **HUG 2007 [Scotland, MHS, QS-]; Karan 1993 [USA, MHS, CS-]; Kotz 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2009a [England, MHS, QS++]**) with some patients reported to be adopting high risk practices such as smoking under bed sheets (**Pritchard 2008 [England, MHS, QS++]**). These concerns were substantiated by reports of: patient injuries, including one case involving serious burns; burns found on carpets and furniture; and patients extinguishing cigarettes in a dangerous manner in an attempt to evade detection (**Kotz 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]**). No serious fires resulting from clandestine smoking were identified in the studies. Concerns about fire risk have been addressed by banning the bringing of flame-producing products onto premises (**Mental Health Foundation 2009 [England, MHS, SCSS+]**) and through on-going staff training to support enforcement (**Pritchard 2008 [England, MHS, QS++]**). None of the studies conducted in broader secondary care settings identified fire-related hazards as an issue of concern following implementation of smokefree policy.

Quantitative findings

No quantitative evidence was identified relating to this theme.

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Increased fire hazard risk

Evidence statement:

3.13 Barrier: belief that clandestine smoking constitutes an enhanced fire hazard risk. Eight studies (five UK, three non-UK), seven conducted in mental health settings and one conducted in broader secondary care settings, found that clandestine smoking in unsupervised, private spaces constituted an enhanced fire hazard risk (**HUG 2007 [Scotland, MHS, QS-]; Karan 1993 [USA, MHS, CS-]; Kotz 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Parle 2004 [Canada, MHS, CS-]; Pritchard 2008 [England, MHS, QS++]; Ratschen 2009a [England, MHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+]**). Three of these studies (two UK, one non-UK), all related to mental health settings, substantiated these risks with reports of patient injuries, burns found on carpets and furniture, and patients extinguishing cigarettes in a dangerous manner in an attempt to evade detection (**Kotz 1993 [USA, MHS, CS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008 [England, MHS, QS++]**). None of the studies reported fires resulting from clandestine smoking.

Of the eight studies reported the majority, five, were conducted within the UK (**HUG 2007 [Scotland, MHS, QS-]; Mental Health Foundation 2009 [England, MHS, SCSS+]; Pritchard 2008**

[England, MHS, QS++]; Ratschen 2009a [England, MHS, QS++]; Ratschen 2008 [England, BHS, MHS, MMS+]).

3.9 Security and safety concerns

Qualitative findings

Staff in both mental health and wider secondary care settings expressed concerns for patients leaving premises to smoke unsupervised, particularly at night and with patients who are frail and have limited mobility, leaving them vulnerable to attack, exposed to low temperatures and at risk of falls and injury (**Fitzpatrick 2009 [Ireland, BHS, MMS+]; Schultz 2011 [Canada, BHS, QS++]; Wheeler 2007 [USA, BHS, MMS-]; Campion 2008 [Australia, MHS, QS+]; Pritchard 2008 [England, MHS, QS++]**). Similar safety concerns were also raised by night shift staff who were required to smoke outside unprotected (**Arack 2009 [England, BHS, SCSS-]**).

Poor supervision of patient smoking could create additional safety and security concerns with emergency escape doors being found open (**McNeill 2007 [Scotland, MHS, QS+]**) and patients being at risk by being unavailable for treatment (**Ratschen 2008 [England, BHS, MHS, MMS+]**). In some cases such concerns were echoed by patients who felt unsafe and worried about getting suddenly sick while smoking off-site (**Schultz 2011 [Canada, BHS, QS++]; Ratschen 2010 [England, MHS, QS++]**), leading some patients to choose to smoke in entrance areas and with other patients or visitors (**Schultz 2011 [Canada, BHS, QS++]**) and to calls for the provision of designated smoking areas on hospital grounds (**Ratschen 2008 [England, BHS, MHS, MMS+]; HUG 2007 [Scotland, MHS, QS-]; Ratschen 2010 [England, MHS, QS++]**). One study also reported health and safety concerns brought about by changes in break patterns and staff availability (**Ratschen 2008 [England, BHS, MHS, MMS+]**).

One Canadian study (**Schultz 2011 [Canada, BHS, QS++]**) raised additional safety concerns about possible equipment failures with patients smoking outdoors, including malfunction of electronic pumps and freezing of intravenous lines due to low temperatures. The same study also raised safety concerns about the reuse of discarded cigarette butts acting as a vector for the spread of disease. Such effects were seen to project contradictory health messages, raised liability issues and led to calls for more effective tobacco dependence treatment.

Quantitative findings

Findings from one study indicate safety concerns among staff surrounding the implementation of smokefree policy. **Wye et al's (2010 [Australia, MHS, SCSS++])** survey of staff in an Australian psychiatric unit before implementation of a total smoking ban revealed that only 26% agreed that the ban would make the unit safer, while 37% disagreed, and 36% of participants were unsure.

A postal survey of English NHS acute and mental health Trusts revealed that of respondents who agreed that psychiatric settings encountered specific problems with regard to smokefree policy implementation, 70% agreed that safety issues were a concern (**Ratschen 2008 [England, BHS, MHS, MMS+]**).

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Security and safety concerns

Evidence statement:

3.14 Barrier: belief that smokefree policy creates additional challenges for patient safety and security. Eight studies (three UK, five non-UK), four conducted in mental health settings and four in broader secondary care settings, reported staff concerns for patient security and safety relating to patients leaving premises to smoke unsupervised (**Fitzpatrick 2009 [Ireland, BHS, MMS+]; Schultz 2011 [Canada, BHS, QS++]; Wheeler 2007 [USA, BHS, MMS-]; Campion 2008 [Australia, MHS, QS+]; Pritchard 2008 [England, MHS, QS++]**; **McNeill 2007 [Scotland, MHS, QS+]**; **Wye 2010 [Australia, MHS, SCSS++]; Ratschen 2008 [England, BHS, MHS, MMS+])**. Two of these studies (one UK, one non-UK), both conducted in broader secondary care settings, reported cases of patients expressing security and safety concerns [**Schultz 2011 [Canada, BHS, QS++]; Ratschen 2010 [England, MHS, QS++]**]. None of the studies provided evidence of any of these concerns being realised.

Four of the nine studies reported were conducted within the UK (**Pritchard 2008 [England, MHS, QS++]**; **McNeill 2007 [Scotland, MHS, QS+]**; **Ratschen 2008 [England, BHS, MHS, MMS+]; Ratschen 2010 [England, MHS, QS++]**) and three were conducted in countries judged to be of similar applicability to the UK (**Fitzpatrick 2009 [Ireland, BHS, MMS+]; Campion 2008 [Australia, MHS, QS+]; Wye 2010 [Australia, MHS, SCSS++]**).

3.10 Impact on the physical environment

Qualitative findings

Findings from a number of studies in both mental health and wider secondary care settings suggest that displacement of smoking to perimeter areas following implementation of smokefree policies can have an adverse impact on the physical environment and wider community relations. This is reflected in criticism of increased congestion and littering found around entrance and perimeter areas (**Schultz 2011 [Canada, BHS, QS++]; Tillgren 1998 [Sweden, BHS, QS-]; Ratschen 2008 [England, BHS, MHS, MMS+]**) which can be intimidating for people entering and leaving buildings (**McNeill 2007 [Scotland, MHS, QS+]**), can create discord with local neighbours and affect service image with the wider community (**Tillgren 1998 [Sweden, BHS, QS-]; Ratschen 2008 [England, BHS, MHS, MMS+]; Johnson 2010 [Canada, MHS, QS++]**) and can create supervision issues (**Campion 2008 [Australia, MHS, QS+]**) and increase ground keeping workloads (**Schultz 2011 [Canada, BHS, QS++]**). It is also suggested that failure to maintain an environment free of tobacco detritus can serve to legitimise smoking and non-compliance (**Wareing 2012 [England, MHS, QS+]**), and may contribute to patients smoking discarded cigarettes butts (**Schultz 2011 [Canada, BHS, QS++]**). However, hospital administrators and supervisors in one US study reported an improvement in the physical environment following the introduction of a full smokefree policy (covering buildings, vehicles and grounds) with a reduction in discarded cigarette butts and fewer patients and staff

smoking on hospital grounds (**Wheeler 2007 [USA, BHS, MMS-]**). These changes were described as having a positive impact on the hospital's image within the wider community (**Wheeler 2007 [USA, BHS, MMS-]**). While another qualitative study reported non-smoking staff expressing relief at no longer being required to enter smoke filled rooms (**Mental Health Foundation 2009 [England, MHS, SCSS+]**).

Quantitative findings

Three quantitative studies reported on beliefs about the effects of smokefree policy on the physical environment (**Wye 2010 [Australia, MHS, SCSS++]**; **Steiner 1991 [USA, MHS, BAS+]**; **Voci 2010 [Canada, MHS, RCSS++]**). These studies suggest that stakeholders acknowledge the beneficial effects of smokefree policies on the physical environment.

Steiner et al (1991 [USA, MHS, BAS+]) reported that before implementation of smokefree policy at a psychiatric day hospital, all staff and 71% of patients who participated in their survey believed the physical environment would improve as a result of the policy. Indeed, after implementation, all staff and 86% of patients believed that this had been the case (the authors did not report whether the finding for patients was significant). **Wye et al (2010 [Australia, MHS, SCSS++])** reported that 64% of staff agreed that a total smoking ban in their psychiatric unit would improve working conditions. **Voci et al's (2010 [Canada, MHS, RCSS++])** post-implementation surveys of staff in a Canadian mental health and addictions facility found that the average level of agreement with the statement that 'smokefree facilities are cleaner' after the implementation of smokefree policy was between 'somewhat agree' and 'strongly agree' (scale: strongly disagree/somewhat disagree/neutral/somewhat agree/strongly agree).

Key: MHS = mental health setting; BHS = broader healthcare setting; QS = qualitative study; CS = case study; SCSS = single cross-sectional study; RCSS = repeat cross-sectional study; BAS = before and after study; MMS = mixed methods study.

Impact on the physical environment

Evidence statement:

3.15 Inconclusive: belief that smokefree policy has a positive impact on the physical environment. Five studies (one UK, three non-UK), four conducted in mental health settings and one in broader secondary care settings, found that smokefree policy was believed to have a positive impact on the physical environment, for example, through the removal of smoke from rooms, cleaner facilities, fewer smokers on hospital grounds and improved work conditions (**Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Wye 2010 [Australia, MHS, SCSS++]**; **Steiner 1991 [USA, MHS, BAS+]**; **Voci 2010 [Canada, MHS, RCSS++]**; **Wheeler 2007 [USA, BHS, MMS-]**). Four other studies (two UK, two non-UK), one conducted in mental health settings and three in broader secondary care settings, found that displacement of smoking to perimeter areas following implementation of smokefree policies had an adverse impact on the physical environment through increased congestion and littering around entrances, and people feeling intimidated entering and leaving buildings (**Schultz 2011 [Canada, BHS, QS++]; Tillgren 1998 [Sweden, BHS, QS-]; Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]**).

Three of the eight studies reported were conducted within the UK (**Mental Health Foundation 2009 [England, MHS, SCSS+]**; **Ratschen 2008 [England, BHS, MHS, MMS+]**; **McNeill 2007 [Scotland, MHS, QS+]**) and one was conducted in a country judge to be of similar applicability to the UK (**Wye 2010 [Australia, MHS, SCSS++]**).

4. Discussion

Findings

The review presents 52 separate views-based evidence statements: 32 barriers, 15 facilitators and 5 inconclusive statements. From those statements judged to be conclusive a number of findings appear to have significant implications for practice regarding the implementation of smokefree policies in secondary care settings. These findings are summarised as follows:

- Exposure to smokefree policy leads to enhanced staff support for the policy in both mental health and broader healthcare settings. The evidence for enhanced support post-implementation amongst patients remains inconclusive.
- Some groups may be more resistant to accepting smokefree policies and appear to require additional support. These include nurses, and staff and patients who smoke, particularly staff who are heavy smokers. These findings relate to both mental health and broader healthcare settings.
- Support for smokefree policies in both settings is higher where policies incorporated provisions for smoking areas. These provisions are seen by staff in both settings to be necessary to supporting policy enforcement. Evidence in mental health settings suggests that the provision of smoking areas is particularly valued by smokers and frontline staff.
- The positioning of smoking areas and adequacy of equipment in terms of lighting, security and weather protection etc, were seen to be important to supporting and encouraging compliance, although in some cases poor access to outdoor areas from wards and service areas can impose significant structural barriers to what can be achieved.
- The widely held attitude found in both settings that smokers have a right to smoke acts as a significant obstacle to acceptance of smokefree policy, and emerged as a factor restricting the willingness of mental health staff to provide cessation support to patients. However, the evidence suggests policy initiatives that underline the addictive properties of smoking may help to overcome this barrier.
- A number of important organisational factors emerged, mainly in mental health settings, which were seen to act as facilitators for smokefree policy. These include: strong leadership; a responsive and committed management; having sufficient time in place to implement a robust consultation process; timing implementation to take advantage of favourable weather conditions; and having in place robust systems for monitoring implementation and responding to problems as they emerge.
- A willingness amongst frontline staff in both settings to assume responsibility for enforcing smokefree policy emerged as a significant barrier. This appears to be in part explained by a lack of clarity on the rules and the way in which they should be applied, and a lack of staff confidence about how to deal with patients who challenge their authority, leading to calls for better management support and greater guidance and training on how to deal with violations.
- Insufficient staff resources, particularly in mental health settings, were regarded as a barrier to enforcement. These resource limitations were seen to constrain staff ability to escort patients to outside areas and to patrol hospital grounds, the latter being particularly challenging where the service had large, shared grounds to which the wider public had access.
- A number of mental health services described the emergence of contraband markets for tobacco as a significant challenge to enforcement of smokefree policy, although secure facilities was reported as offering more favourable conditions for policing.

- The introduction of smokefree policy can act as a trigger for patients to considering quitting. However, uptake by those expressing a readiness to quit is considered more likely when cessation support is framed as an initiative designed to improve patient health and not simply to accommodate the smokefree ordinance. Findings suggest that provisions also need to be made for those inpatients seeking temporary abstinence whilst attending for treatment.
- A number of factors were identified from both settings which were believed could enhance both the uptake and value of cessation support as part of a smokefree policy: improved provision of information materials, pharmacotherapies, trained staff and diversionary activities; better continuity with stop smoking services provided in the community, including advanced warning of smokefree rules; and provision of comparable services for staff who wish to stop smoking.
- Three mental health patient groups emerge who it is believed require special consideration and potential discretionary exemption status from smokefree policies: long-stay psychiatric patients receiving continuing care who may regard the mental health facility as their home; cognitively impaired and acutely ill psychiatric patients who have limited capacity to understand and to retain the information surrounding the policy and who can present a significant risk to staff; and patients being treated for other addictive disorders who it is believed may find stopping smoking whilst simultaneously giving up other substances interferes with their recovery.

As well as identifying barriers and facilitators to implementing smokefree policy which have direct implications for practice in secondary care settings, the review also identified beliefs held by staff regarding negative consequences associated with implementation of smokefree policies. Beliefs where conclusive evidence was found are as follows:

- Belief that smokefree policy would adversely affect psychiatric patients' mental health**.** There is some evidence that these beliefs can diminish after exposure to the policy.
- Enforcement of smokefree policy in both settings would result in an increase in abuse and aggression. Evidence suggests that the frequency and levels of abuse actually experienced are lower than expected.
- Belief that smokefree policies were damaging to the patient-carer relationship and the therapeutic environment, a view expressed particularly by staff in mental health settings. Fewer studies (one in each setting) identified positive contributions to the patient-carer relationship and the therapeutic environment made by smokefree policies.
- Belief that changing break patterns brought about by smokefree policy places extra demands on staff time and resources and disrupts patient attendance for treatment and participation in therapeutic activity in both settings. These concerns appear to have been borne out by staff experience.
- Belief that implementing smokefree policy in mental health settings results in an increased requirement for patient medication. There was a belief that these increases were not as significant as had been anticipated. There was also evidence of a lack of understanding by staff about the interaction between stopping smoking and dose requirements for antipsychotic medications.
- Belief that smokefree policy discourages patients from attending for outpatient appointments, and results in inpatients refusing admission and discharging against medical advice. These concerns were mainly voiced by staff in mental health settings and the evidence suggests that negative outcomes were not always realised or did so at a diminished level.

- Belief that clandestine smoking brought about by smokefree policy constitutes an enhanced fire hazard risk, a belief largely expressed by staff in mental health settings. Although no fires were reported as a consequence of smokefree policies in any of the study sites, there does appear to be compelling evidence of enhanced risk.

Strengths

The review provided a broad body of qualitative and quantitative views-based evidence about factors affecting the adoption of, support for and compliance with smokefree policies and interventions in secondary care settings. Fifty-three studies published in English since 1990, were identified, with data subsequently extracted from 54 papers. Nearly two-fifths of these studies (n=20) were conducted in the UK and all but one was published since 2006. This large body of data allowed the team to conduct a narrative synthesis of related evidence incorporating both staff and patient perspectives providing insight into factors that influence acceptance and adoption of smokefree policies, many of which are likely to have implications for the development of practice in this area. From a UK perspective recent developments in smokefree policy in wider communities would appear to act as key driver to acceptance of smokefree initiatives in mental health and wider secondary care settings.

The narrative synthesis was wide-reaching in its approach. It extended beyond studies which specifically described barriers and facilitators to implementing smokefree policies and interventions to include more general reports of practitioners', administrators' and service users' experiences of, belifs about and attitudes towards smokefree policy. This enabled the review to develop a broad thematic framework for identifying barriers and facilitators, critical to which was the synthesis of qualitative data which was used to expand upon and explain findings to emerge from the review of quantitative studies. Both types of data were then subsequently combined in the evidence statements where relevant. One advantage of the thematic analysis is that it helps to maintain transparency of the synthesis process, although the tendency to weight findings as a function of frequency risks underplaying any qualitative differences that exist.

Fifty-two separate evidence statements were constructed. These are presented in the report by related theme under the three subsidiary questions used to guide the review. The evidence statements are generally judged to have high applicability with the majority (36 out of 52) derived from data drawn predominantly from UK studies (i.e. where more than half of the studies reported have been conducted within the UK), and nearly a third (14 out of 52) are derived from data drawn entirely from UK studies. Only three of the evidence statements are based on data drawn exclusively from non-UK studies. Findings from other countries did not differ substantially from those reported in the UK, though in practice there may be differences in the organisation of health care delivery. Four of the non-UK studies were conducted in countries judge to have similar applicability to the UK, one in Ireland and three in Australia.

Limitations

The review provided wide-ranging insights into implementation of smokefree policies in mental health settings, with 32 of the 52 studies conducted exclusively in this setting. However, the ability of the review to examine implementation in acute and maternity settings was more limited. Only one of the 52 studies made specific reference to maternity services, while a number of the mental health study findings relate to acute mental health services. The twenty 'non-mental health' studies

were conducted in other secondary care settings such as general hospitals, teaching hospitals and NHS trusts. Consequently, some of these broader studies may also include mental health services or wards. For the purposes of the review, these settings are referred to as broader secondary care settings, and are likely to include acute and maternity services. In addition, irrespective of setting, it is important to underline that while findings relate to staff and patients' experiences of smokefree policy, much of the evidence is derived from unsupported beliefs about effect.

In many cases the study did not explicitly state if the setting was relevant only to inpatients, to outpatients or to both. Consequently, information on patient populations of interest to the review is incomplete. Where this information was provided this has been summarised in **Tables 1a** and **1b**. For classification purposes it is assumed the studies conducted in general facilities, such as teaching hospitals, general hospitals and acute NHS trusts, are of relevance to both inpatient and outpatient populations.

There was also a lack of clarity about the type of smokefree policy under investigation and limited reporting of support strategies and interventions. For the purposes of the review, and as far as was possible, the studies have been categorised according to the types of spaces covered by the policy (i.e. outdoor smokefree and/or indoor smokefree, see **Tables 1a** and **1b**) There was insufficient data to confirm if these policies also included designated indoor or outdoor spaces for smoking in all cases. In addition information regarding the legislative context for the countries where studies were conducted is provided in **Appendix 1**.

Finally, there was also considerable variability in the level of information provided on methodological approach and research design, for example, some quantitative studies did not report statistical analysis and some qualitative case studies failed to provide information on sample and data collection methods, and in some cases findings were not demonstrated using illustrative data. The lack of reporting of methodological approach and original data made quality assessment difficult in some instances, particularly with case studies where reporting may have been selective. However, following recognised practice in synthesis, studies papers were not excluded on the basis of their appraised quality.

The overall quality of the included studies was judged to be moderate. Quality scores for the included qualitative studies were evenly distributed across the three score ranges, and both validity scores for the included quantitative studies were equally balanced with the majority of papers being judged in the mid-range, '+'.

Gaps

Two areas were identified where there was an absence of useful data:

- The value and role played by sanctions in enforcement and encouraging compliance with of smokefree policies.
- The perspectives of specific population groups; visitors, friends and relatives of inpatients, and non-clinical/non-healthcare staff responsible for policing and maintaining grounds and health care facilities.

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Review 7 Included Studies

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Component 3 Smokefree Secondary Care Settings

Review 7

APPENDICES

Draft 3 26th October 2012

November 2021: NICE guidelines PH45 (June 2013) and PH48 (November 2013) have been updated and replaced by NG209.
The recommendations labelled [2013] or [2013, amended 2021] in the updated guideline were based on these evidence reviews.
See www.nice.org.uk/guidance/NG209 for all the current recommendations and evidence reviews.

APPENDIX 1: Summary of Included Study Countries' Smokefree Status

Country States/Provinces	**Public places with complete <u>national</u> indoor smokefree legislation for Health-Care Facilities at 31st December 2008**[1]	**Public places with complete <u>subnational</u> indoor smokefree legislation for Health-Care Facilities at 31st December 2008**[1]	**Additional Information (from Review 6 and Review 7's included papers)**
Australia	**No**		
Australian Capital Territory, New South Wales, Northern Territory, Queensland, South Australia, Tasmania, Victoria, Western Australia		Yes (all)	• **New South Wales State**: legislation introduced in 1988 which required a total prohibition of smoking by all staff, patients and visitors in all hospital buildings and vehicles **(Nagle, 1996)**. • **Queensland State**: As of 2005, there was no formal policy regarding smoking in any acute mental health unit in the State **(Campion 2008)**. • **South Australia State**: Smoking banned inside hospitals in the State 'for many years' but smoking has been allowed outdoors either in defined areas or alternatively, areas where smoking is banned are defined **(Jones, 2010)**.
Canada	**No**		
Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Northwest Territories, Nova Scotia, Nunavut, Ontario, Prince Edward Island, Quebec, Saskatchewan, Yukon		Yes (all)	• **Ontario Province**: *Tobacco Control Act 1994* banned smoking in all government buildings. Large psychiatric facilities sought and received special dispensation from the Provincial Ministry of Health and Long Term Care to allow patients and some staff to smoke in specially ventilated rooms **(Parle, 2004)**. The *Smoke-Free Ontario Act* (enacted May 31st 2006) prohibits smoking in all enclosed workplaces and public places in Ontario. All long-term and residential care facilities, including psychiatric facilities, are exempted from this legislation and are permitted to provide controlled designated smoking rooms to allow residents, but not staff, to smoke **(Voci, 2010)**. • **Calgary City**: Calgary Health Region (CHR) went entirely smokefree on May 31st 2002, banning tobacco use indoors as well as on all CHR-owned property. It was the first health region in Canada to do so **(Patterson, 2008)**.
Denmark	**Yes**		

[1] **Data Source:** World Health Organization (2009). *WHO Report on the Global Tobacco Epidemic, 2009: Implementing smoke-free environments*. Geneva: World Health Organization. http://whqlibdoc.who.int/publications/2009/9789241563918_eng_full.pdf. [WHO defines "indoor smokefree" as "Smoking is not allowed at any time in any indoor area under any circumstances"]

Greece	**No**		• Greece enacted legislation (*Health Law 76017*) in August 2002 prohibiting smoking in all health care centres such as public and private hospitals, health centres and pharmacies **[Vardavas, 2009]**.
Israel	**Yes**		• 2001 anti-smoking law completely banned smoking in all hospitals in Israel **(Donchin, 2004)**.
Ireland	**Yes**		• Legislation banning smoking in indoor workplaces came into force in 2004 **[Fitzpatric, 2009]**.
Sweden	**Yes**		• A Tobacco Act was passed in the Swedish Parliament in July 1993 that banned smoking in all buildings providing health care **[Tillgren, 1998]**.
Switzerland	**No**		
Ticino		Yes	
UK	**Yes**		
England , Northern Ireland, Scotland , Wales		Yes (all)	**England and Wales**: • The *National Service Framework for Coronary Heart Disease* required that by April 2001, all NHS bodies, in collaboration with Local Authorities, must have implemented a smoking policy **(Arack, 2009; Bloor, 2006)**. • The 2004 Department of Health White Paper *Choosing Health: Making Healthier Choices Easier* made a commitment to a smokefree NHS by the end of 2006 **(Arack, 2009; Parks, 2009; Praveen, 2009)**. • The *Health Act 2006* banned smoking in all enclosed or substantially enclosed public places and workplaces, including health care facilities from July 1st 2007 **(Arack, 2009; Cormac, 2010; Garg, 2009; Parks, 2009; Praveen, 2009; Pritchard, 2008; Smith, 2008; Ratschen, 2008)**. Mental health facilities were granted a temporary exemption for one year during which time designated smoking rooms meeting specified requirements were permitted **(Hill, 2007; Praveen, 2009; Pritchard, 2008; Smith, 2008)**. From July 1st 2008 smoking was banned in any enclosed or substantially enclosed part of mental health establishments **(Hill, 2007; Mental Health Foundation, 2009; Pritchard, 2008; Smith, 2008).** **Scotland** • Legislation banning smoking in enclosed public places came into force in 2006. Psychiatric facilities were one of the few settings exempt from the ban **(HUG, 2007; McNeill, 2007)**
USA	**No**		• In December 1988, officials of the United States Department of Veterans Affairs (VA) announced the goal of establishing smoke-free VA acute care facilities by mid-1989. Psychiatric facilities were excluded from this proclamation **(Erwin, 1991)**. • In May 1988 the Surgeon General and the Medicare Administrator sent letters to 7,000 Medicare hospitals asking for action to establish smokefree environments in their facilities **(Baile, 1991)**. • A bill requiring all hospitals participating in Federal Health Programs to adopt no-smoking

			policies was introduced in Congress in the late 1980s, but the bill was defeated **(Baile, 1991)**. • The Joint Commission on the Accreditation of HealthCare Organizations (JCAHO) declared that all accredited hospitals in the USA must be smokefree as of January 1992 **(Haller, 1996; Ryabik, 1995; Velasco, 1996)**. • Effective December 31st 1993, the JCAHO introduced indoor restrictions on smoking as a quality indicator **(Sheffer, 2009)**. • The JCAHO required all hospitals in the USA to be smokefree from January 1st 1994 **(Stillman, 1995).**
Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Hawaii, Idaho, Illinois, Iowa, Maryland, Massachusetts, Minnesota, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Utah, Washington, Wisconsin		Yes	
California, Florida, Georgia, Kansas, Louisiana, Maine, Michigan, Mississippi, Missouri, North Carolina, Oklahoma, Vermont, Virginia, West Virginia		No	
Alabama, Indiana, Kentucky, South Carolina, Texas, Wyoming		Not reported by WHO	

APPENDIX 2: Sample database search strategies for Smokefree strategies and interventions in secondary care settings (Reviews 6 &7)

MEDLINE (includes Medline in Process)
Database host: EBSCO Host
Search date: 7/2/2012
Number of records: 4269

#	Query
S29	S25 NOT S28 Limiters - Date of Publication from: 19900101-20121231
S28	S27 NOT S26
S27	(MH "Animals")
S26	(MH "Animals") AND (MH "HUMANS")
S25	S23 or S24
S24	((S18 OR S19) AND S17)
S23	(S22 AND S16)
S22	(S18 or S19 or S20 or S21)
S21	TI ("acute care" OR "acute service#" OR "acute setting#" OR "acute trust#" OR "ambulance#" OR "health centre#" OR "care centre#" OR "health center#" OR "care center#" OR "inhospital" OR "national health service" OR "national health services" OR "secondary care" OR accident OR (acute N2 department#) OR "acute unit#" OR emergency OR "health authorities" OR "health board#" OR "clinical care" OR "clinical unit#" OR "care facilities" OR "care facility" OR "care unit#" OR "care trust" OR "elective care" OR "medical care" OR "health service#" OR "health system#" OR "health trust#" OR "health unit#" OR "healthcare unit#" OR "heath authority" OR hospice# OR hospitalised OR hospitalized OR hospital OR hospitals OR maternity OR prenatal OR perinatal OR antenatal OR obstetric# OR inpatient# OR "prison healthcare" OR "prison health" OR "NHS Trust#" OR outpatient# OR patient# OR psychiatric OR PCTs OR "mental health*" OR (secure W3 unit#) OR surgery OR "residential care" OR "long term care" OR "specialist unit#" OR "specialist care" OR "speciality care" OR "staff residence" OR "staff residency" OR "staff residencies" OR "staff accommodation" OR ward#)
S20	AB ("acute care" OR "acute service#" OR "acute setting#" OR "acute trust#" OR "ambulance#" OR "health centre#" OR "care centre#" OR "health center#" OR "care center#" OR "inhospital" OR "national health service" OR "national health services" OR "secondary care" OR accident OR (acute N2 department#) OR "acute unit#" OR emergency OR "health authorities" OR "health board#" OR "clinical care" OR "clinical unit#" OR "care facilities" OR "care facility" OR "care unit#" OR "care trust" OR "elective care" OR "medical care" OR "health service#" OR "health system#" OR "health trust#" OR "health unit#" OR "healthcare unit#" OR "heath authority" OR hospice# OR hospitalised OR hospitalized OR hospital OR hospitals OR maternity OR prenatal OR perinatal OR antenatal OR obstetric# OR inpatient# OR "prison healthcare" OR "prison health" OR "NHS Trust#" OR outpatient# OR patient# OR psychiatric OR PCTs OR "mental health*" OR (secure W3 unit#) OR surgery OR "residential care" OR "long term care" OR "specialist unit#" OR "specialist care" OR "speciality care" OR "staff residence" OR "staff residency" OR "staff residencies" OR "staff accommodation" OR ward#)
S19	(MH "Administrative Personnel") OR (MH "Adolescent, Hospitalized") OR (MH "Cancer Care Facilities") OR (MH "Cardiac Care Facilities") OR (MH "Child, Hospitalized") OR (MH "Emergency Medical Services") OR (MH "Emergency Service, Hospital+") OR (MH "Home Care Services") OR (MH "Home Care Services, Hospital-Based") OR (MH "Hospices") OR (MH "Hospital Administration") OR (MH "Hospital Administrators") OR (MH "Hospital Communication Systems") OR (MH "Hospital Design and Construction") OR (MH "Hospital Units+") OR (MH "Hospitalization+") OR (MH "Hospitals, Chronic Disease") OR (MH "Hospitals, Community") OR (MH "Hospitals, Convalescent") OR (MH "Hospitals, County") OR (MH "Hospitals, District") OR (MH "Hospitals, Federal") OR (MH "Hospitals, General") OR (MH "Hospitals, Isolation") OR (MH "Hospitals, Maternity") OR (MH "Hospitals, Municipal") OR (MH "Hospitals, Osteopathic") OR (MH "Hospitals, Pediatric") OR (MH "Hospitals, Private") OR (MH "Hospitals, Proprietary") OR (MH "Hospitals, Psychiatric") OR (MH "Hospitals, Public") OR (MH "Hospitals, Religious") OR (MH "Hospitals, Rural") OR (MH "Hospitals, Satellite") OR (MH "Hospitals, Special") OR (MH "Hospitals, State") OR (MH "Hospitals, Teaching") OR (MH "Hospitals, University") OR (MH "Hospitals,

	Urban") OR (MH "Hospitals, Voluntary") OR (MH "Hospitals+") OR (MH "Inpatients") OR (MH "Legislation, Hospital") OR (MH "Maintenance and Engineering, Hospital") OR (MH "Maternal Health Services+") OR (MH "Medical Staff, Hospital") OR (MH "Nurse-Patient Relations") OR (MH "Nursing Staff, Hospital") OR (MH "Obstetrics and Gynecology Department, Hospital") OR (MH "Outpatient Clinics, Hospital+") OR (MH "Outpatients") OR (MH "Patient Acceptance of Health Care") OR (MH "Patient Admission") OR (MH "Patient Advocacy") OR (MH "Patient Compliance") OR (MH "Patients") OR (MH "Personnel, Hospital") OR (MH "Physician-Patient Relations") OR (MH "Psychiatric Department, Hospital") OR (MH "Psychiatric Nursing") OR (MH "Surgicenters") OR (MH "Visitors to Patients")
S18	(MH "Health Facilities+") OR (MH "Health Facility Administration+") OR (MH "Health Facility Environment+")
S17	(MH "Smoking/PC") OR (MH "Tobacco Use Disorder/PC") OR (MH"Tobacco Use Cessation")
S16	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S15
S15	((S13 OR S14) AND S12)
S14	TI (smoking OR tobacco OR cigarette# OR smokers OR smoke OR nonsmoking OR nonsmokers) OR AB (smoking OR tobacco OR cigarette# OR smokers OR smoke OR nonsmoking OR nonsmokers)
S13	(MH "Smoking") OR (MH "Smoking Cessation") OR (MH "Tobacco Use Disorder") OR (MH"Tobacco Use Cessation")
S12	(MH "Social Control Policies") OR (MH "Social Control, Formal") OR (MH "Legislation as Topic") OR (MH "Legislation, Hospital") OR (MH "Organizational Policy") OR (MH "Public Policy") OR (MH "Health Policy")
S11	(MH "Tobacco Smoke Pollution/LJ") OR (MH "Tobacco Smoke Pollution/PC") OR (MH "Smoking/LJ") OR (MH "Smoking Cessation/LJ")
S10	(TI ((bans OR ban OR banning OR restrict* OR prohibit* OR sanction# OR eliminat* OR remov* OR restrict* OR eradicat* OR sanction* OR curbs OR curb OR curbing OR enforce# OR enforcing OR control* OR prevent*)) N3 (("second hand" N1 smok*) OR (secondhand N1 smok*) OR (passive N1 smok*) OR (environmental N2 smoke) OR "involuntary smoking" OR (pollution N2 tobacco) OR (pollution N2 cigarette#))) OR (AB ((bans OR ban OR banning OR restrict* OR prohibit* OR sanction# OR eliminat* OR remov* OR restrict* OR eradicat* OR sanction* OR curbs OR curb OR curbing OR enforce# OR enforcing OR control* OR prevent*)) N3 (("second hand" N1 smok*) OR (secondhand N1 smok*) OR (passive N1 smok*) OR (environmental N2 smoke) OR "involuntary smoking" OR (pollution N2 tobacco) OR (pollution N2 cigarette#)))
S9	AB ((workplace# OR place# OR zone# OR space# OR facility OR facilities OR area# OR location# OR premises OR propert* OR site# OR building# OR campus* OR ground# OR establishment# OR room# OR shelter# OR environment# OR enclos* OR hospital#) N1 ("non smoking" OR nonsmoking)) OR (AB (smoking OR "smoking break#" OR smoke OR smoker#) N1 (place# OR zone# OR space# OR facility OR facilities OR area# OR location# OR premises OR building# OR room# OR shelter# OR site# OR enclos*))
S8	TI ((workplace# OR place# OR zone# OR space# OR facility OR facilities OR area# OR location# OR premises OR propert* OR site# OR building# OR campus* OR ground# OR establishment# OR room# OR shelter# OR environment# OR enclos* OR hospital#) N1 ("non smoking" OR nonsmoking)) OR (TI (smoking OR "smoking break#" OR smoke OR smoker#) N1 (place# OR zone# OR space# OR facility OR facilities OR area# OR location# OR premises OR building# OR room# OR shelter# OR site# OR enclos*))
S7	(TI ("tobacco control#" OR "cigarette# control#" OR "smoking control#" OR ("control tobacco" OR "control cigarette#" OR "control smoking"))) OR (TI ("control* tobacco" OR "control* cigarette#" OR "control* smoking")) OR (TI ("smoking break#" OR smoke) N2 (control* OR prevent OR preventing OR prevents OR prevention)) OR (TI (tobacco OR cigarette# OR smoking) N2 (prevent OR preventing OR prevents OR prevention)) OR (AB ("tobacco control#" OR "cigarette# control#" OR "smoking control#" OR ("control tobacco" OR "control cigarette#" OR "control smoking"))) OR (AB ("control* tobacco" OR "control* cigarette#" OR "control* smoking")) OR (AB ("smoking break#" OR smoke) N2 (control* OR prevent OR preventing OR prevents OR prevention)) OR (AB (tobacco OR cigarette# OR smoking) N2 (prevent OR preventing OR prevents OR prevention))
S6	TI ((smoking OR tobacco OR cigarette# OR smokers OR "smoking break#" OR smoke) N3 (bans OR ban OR banning OR restrict* OR prohibit* OR eliminat* OR remov* OR restrict* OR eradicat* OR sanction* OR curbs OR curb OR curbing OR enforce# OR enforcing)) OR AB ((smoking OR tobacco OR cigarette# OR smokers OR "smoking break#" OR smoke) N3 (bans OR ban OR banning OR restrict* OR prohibit* OR eliminat* OR remov* OR restrict* OR eradicat* OR sanction* OR curbs OR curb OR curbing OR enforce# OR enforcing))
S5	TI ((act or acts or policy OR policies OR rule# OR "hospital guideline#" OR law# OR regulation# OR rules

	OR rule OR ordinance# OR legislat* OR code# OR compliance) N3 (smoking OR tobacco OR cigarette# OR smokers OR nonsmoking OR nonsmokers OR smoke)) OR AB ((act or acts or policy OR policies OR rule# OR law# OR regulation# OR rules OR rule OR "hospital guideline#" OR ordinance# OR legislat* OR code# OR compliance) N3 (smoking OR tobacco OR cigarette# OR smokers OR nonsmoking OR nonsmokers OR smoke))
S4	TI ("no smoking" OR antitobacco OR "anti tobacco" OR "antismoking" OR "anti smoking") OR AB ("no smoking" OR antitobacco OR "anti tobacco" OR "antismoking" OR "anti smoking")
S3	TI ("end smoking") OR TI ("ending smoking") OR AB (("end smoking") OR ("ending smoking"))
S2	TI ((tobacco W2 free) OR (cigarette W2 free)) OR AB ((tobacco W2 free) OR (cigarette W2 free))
S1	TI ("smoke free" OR "smoking free" OR smokefree) OR AB ("smoke free" OR "smoking free" OR smokefree)

Trials Register of Promoting Health Interventions (TRoPHI)
Database host: EPPI-Centre
Database coverage dates: 2005-current
Search date: 14/2/2012
Number of records retrieved: 126

344 Focus of the report: tobacco 823
345 Type(s) of intervention: environmental modification OR legislation OR regulation 387
346 344 AND 345 49
347 Freetext (item record) smokefree 3
351 Freetext (item record) antitobacco 1
352 Freetext (item record) antismoking 16
353 Freetext (item record) "anti smoking" 17
354 Freetext (item record) "anti tobacco" 5
355 Freetext (item record) "smoke free" 23
356 Freetext (item record) "smoking free" 0
357 Freetext (item record) "smokefree" 3
358 Freetext (item record) "tobacco free" 2
359 Freetext (item record) "cigarette free" 0
361 Freetext (item record) "end smoking" 0
362 Freetext (item record) "ending smoking" 0
363 Freetext (item record) "non smoking" 16
364 351 OR 352 OR 353 OR 354 OR 355 OR 356 OR 357 OR 358 OR 359 OR 361 OR 362 OR 363 78
365 Freetext (item record) smoke 134
366 Freetext (item record) smoking 690
367 Freetext (item record) tobacco 270
368 Freetext (item record) "cigarette*" 226
369 Freetext (item record) "environment*" 378
370 365 OR 366 OR 367 OR 368 OR 369 1148
371 Freetext (item record) "ban*" 102
372 Freetext (item record) "prohibit*" 4
373 Freetext (item record) "hospital" 297
374 Freetext (item record) hospitals 46
375 371 OR 372 OR 373 OR 374 420
376 370 AND 375 81
378 364 AND 375 10
379 346 OR 376 OR 378 126

APPENDIX 3: Inclusion decision questions applied at title and abstract screening stage, with guidance notes (Reviews 6 & 7)

Criterion	Guidance notes	Decision
1. YEAR: Was the document published during or after 1990?	Include studies published during or after 1990. Exclude studies before 1990.	If yes, proceed to 2. If no, use EX1 – NOT YEAR
2. LANGUAGE: Was the document published in English?	Include English-language documents. Exclude documents in languages other than English.	If yes, proceed to 3. If no, use EX2 – NOT LANGUAGE
3. RESEARCH: Does the document report on a piece of research?	Include documents that are primary research, in that data have been collected during that study through interaction with or observation of study participants, or secondary research, such as systematic reviews of the literature. Examples of non-research documents include opinion pieces, commentaries, or legislation.	If yes, proceed to 4. If no, use EX3 – NOT RESEARCH
4. SMOKEFREE: Does the title or abstract refer to smokefree strategies or interventions?	Include studies of specific activities or strategies designed to support the implementation of smokefree legislation or policies. If the legislation or policy is not explicitly stated, interventions where the removal of second-hand smoke or environmental tobacco smoke is an explicit aim will be included. Examples of interventions include, but are not restricted to: • restrictions to eliminate smoking on hospital and other secondary care properties and estates, both indoors and outdoors, including signage and enforcement • restrict ions on staff smoking breaks • revised job descriptions to include policy enforcement by staff • creation of smokefree ‘champions’ • campaign and information materials to alert staff and service users of proposed and impending policy changes • interventions that help people temporarily abstain from smoking whilst	If yes, proceed to 5. If no, use EX4 – NOT SMOKEFREE

	onsite. Activities/interventions that will not be covered • Programmes or interventions exclusively aimed at preventing the uptake of tobacco use. • Programmes or interventions exclusively aimed at supporting tobacco use cessation.	
5. SECONDARY CARE: Was the study conducted in a secondary care setting or with secondary care staff?	Include studies where the smoking policy is conducted in a mental health, acute or maternity secondary care settings. Also include other settings where secondary care staff undertake their work where second-hand smoke may be present. Secondary care is defined as a service provided by medical specialists who generally do not have first contact with patients—usually referred to by a GP—such as psychiatrist, dermatologist, etc. • Included secondary care settings are the buildings and grounds of hospitals (including accident and emergency departments), psychiatric units, mental health units, secure hospitals, maternity units, outpatient clinics and staff residencies. • The buildings and grounds of prison healthcare units and tertiary care services where secondary healthcare staff are employed, or secondary healthcare is provided, are settings that will be included. • Smokefree legislation in the UK covers enclosed vehicles for paid and voluntary work, thus ambulances and hospital vehicles are also included as settings. Activities/interventions that will not be covered: • Strategies and interventions for ensuring smokefree compliance in primary care settings (e.g., GP surgeries). • Studies looking at policies that apply to public spaces more generally (e.g., national legislation banning smoking in all closed public places) - even if the public spaces might include secondary health care settings.	If yes, proceed to 6. If no, use EX5 – NOT SECONDARY CARE
6. COMMUNITY SETTINGS BUT NOT SMOKEFREE: Was the study conducted in a secondary care	Exclude community and private residences settings where it is not EXPLICIT from the study paper's title or abstract that they relate to i) smokefree policies/legislation and ii) the secondary care worker/the type of secondary care delivered.	If yes, proceed to 7. If no, use EX6 -

setting (same as Q5), OR in a community or private residence setting AND explicitly refers to smokefree policies and secondary care workers/services?	Include any other type of secondary care setting, or any community and private residences settings where it is that the study relates to i) smokefree policies/legislation and ii) the secondary care worker/the type of secondary care delivered.	COMMUNITY SETTINGS BUT NOT SMOKEFREE
7. RESEARCH DESIGN: Is the study design a comparison (e.g., controlled trials, before-and-after) and/or views or process evaluation (e.g., interviews, surveys)?	The study must be a comparison design or include views/process data on barriers and facilitators. Eligible comparison designs: reviews of reviews, systematic reviews and guidelines (including NICE guidelines), randomised controlled trials, controlled trials, controlled before and after studies, interrupted time series, and uncontrolled before and after studies. Eligible views/process evaluations: This includes trials (controlled and non-controlled), descriptive studies (including questionnaire surveys, and process evaluations), qualitative studies (including, but not restricted to, ethnographies, phenomenologies, and grounded theory studies), discussion papers or reports, and 'views studies' (which are written based on a multiple perspective approach with an emphasis on guidance for health professionals). Any studies without these research designs (e.g., single case studies) should be excluded.	If yes, proceed to 8. If no, use EX7 – NOT RESEARCH DESIGN
8. EFFECTIVENESS: Does the study evaluate the effectiveness of an intervention?	Include if the study evaluates the effectiveness of an intervention. The study must evaluate the effectiveness of an intervention (or interventions) either through a comparison with a control group or comparison across time, or through reviews of the evidence. Specifically: reviews of reviews, systematic reviews and guidelines (including NICE guidelines), randomised controlled trials, controlled trials, controlled before and after studies, interrupted time series, and uncontrolled before and after studies.	If yes, use IN1 - EFFECTIVENESS. Then proceed to 9. If no, proceed to 9.
9. BARRIERS/FACILITATORS: Does the title or abstract include barriers or facilitators (including	Include if the title or abstract includes barriers or facilitators (including knowledge, attitudes and beliefs) of using or implementing an intervention. The study must include qualitative and/or quantitative evidence of views and	If yes, use IN2 - BARRIERS/FACILITATORS.

knowledge, attitudes and beliefs) of using or implementing smoking cessation interventions/ services?	opinions – questionnaire surveys, process evaluations and qualitative studies; both primary studies and systematic reviews.	End of criteria.
Marker1	Marker for not high income country. Mark any study that was not conducted in a high income country. High income countries are: Andorra, Aruba, Australia, Austria, Bahamas, The, Bahrain, Barbados, Belgium, Bermuda, Brunei Darussalam, Canada, Cayman Islands, Channel Islands, Croatia, Curaçao, Cyprus, Czech Republic, Denmark, Equatorial Guinea, Estonia, Faeroe Islands, Finland, France, French Polynesia, Germany, Gibraltar, Greece, Greenland, Guam, Hong Kong SAR, China, Hungary, Iceland, Ireland, Isle of Man, Israel, Italy, Japan, Korea, Rep., Kuwait, Liechtenstein, Luxembourg, Macao SAR, China, Malta, Monaco, Netherlands, New Caledonia, New Zealand, Northern Mariana Islands, Norway, Oman, Poland, Portugal, Puerto Rico, Qatar, San Marino, Saudi Arabia, Singapore, Sint Maarten (Dutch part), Slovak Republic, Slovenia, Spain, St. Martin (French part), Sweden, Switzerland, Trinidad and Tobago, Turks and Caicos Islands, United Arab Emirates, United Kingdom, United States, Virgin Islands (U.S.)	

APPENDIX 4: Websites search summary (Reviews 6 & 7)

#	Websites searched	Results
1.	Smoke free http://smokefree.nhs.uk	0
2.	NHS Centre for Smoking Cessation and Training http://www.ncsct.co.uk/	0
3.	Action on Smoking and Health (ASH) http://www.ash.org.uk	0
4.	Treat tobacco.net http://www.treatobacco.net/en/index.php	0
5.	Society for Research on Nicotine and Tobacco http://www.srnt.org	0
6.	International Union against Cancer http://www.uicc.org	0
7.	WHO Tobacco Free Initiative (TIF) http://www.who.int/tobacco/en	0
8.	International Tobacco Control Policy Evaluation Project http://www.itcproject.org	0
9.	Tobacco Harm Reduction http://www.tobaccoharmreduction.org/index.htm	0
10.	Current controlled trials www.controlled-trials.com	0
11.	Association for the treatment of tobacco use and dependence (ATTUD) www.attud.org	0
12.	National Institute on drug abuse- the science of drug abuse and addiction http://www.nida.nih.gov/nidahome.html	0
13.	NICE http://www.nice.org.uk/	0
14.	Public health observatories http://www.apho.org.uk/resource/advanced.aspx	0
15.	Scottish Government http://www.scotland.gov.uk/topics/research	0
16.	Welsh Government http://wales.gov.uk/	0
17.	NHS Evidence https://www.evidence.nhs.uk/	1
18.	Joseph Rowntree Foundation http://www.jrf.org.uk/publications	0
19.	UK Centre for Tobacco Control Studies http://www.ukctcs.org/ukctcs/index.aspx	0
20.	World Conference on Tobacco or Health abstracts from 2006, 2009, 2012 conferences	57
21.	Globalink http://www.globalink.org/	0
22.	CDC tobacco control and prevention http://www.cdc.gov/tobacco/	1
23.	Canadian Council for Tobacco Control http://www.cctc.ca/cctc/EN/tcrc/articles/tcarticle.2010-12-24.4349020582	11
24.	Tobacco Information Scotland http://www.tobaccoinscotland.com/page.cfm?pageid=71	0
Total number of records found		**70**

APPENDIX 5: Inclusion decision questions applied at full text screening stage, with guidance notes (Reviews 6 & 7)

Notes:

- Shading: reviews 6 & 7; review 6 only; review 7 only
- Each study should have either **one** EX1-EX5 code or **two** review-specific codes

Criterion	Guidance notes	Decision
1. YEAR: Was the document published during or after 1990?	Include studies published during or after 1990. Exclude studies before 1990.	If yes, proceed to 2. If no, use EX1 on FT – NOT YEAR
2. LANGUAGE: Was the document published in English?	Include English-language documents. Exclude documents in languages other than English.	If yes, proceed to 3. If no, use EX2 on FT – NOT LANGUAGE
3. RESEARCH: Does the document report on a piece of primary research?	Include documents that are primary research, in that data have been collected during that study through interaction with or observation of study participants. Exclude reviews but mark systematic reviews to be checked for relevant included studies for Reviews 6 and 7. Examples of non-research documents include opinion pieces, commentaries, or legislation.	If yes, proceed to 4. If no, use EX3 on FT – NOT PRIMARY RESEARCH & mark if a systematic review
Marker 1: Review	*Review excluded but the included studies are to be checked for relevant studies for our reviews.*	
4. SMOKEFREE: Does the document examine smokefree legislation, smokefree policy(ies) or smokefree intervention(s)?	Include studies that examine smokefree legislation or policies or a smokefree intervention(s). If the legislation or policy is not explicitly stated, examination of interventions where the removal of second-hand smoke or environmental tobacco smoke is an explicit aim will be included. Examples of interventions include, but are not restricted to: • restrictions to eliminate smoking on hospital and other secondary care properties and estates, both indoors and outdoors, including signage and enforcement • restrictions on staff smoking breaks • revised job descriptions to include policy enforcement by staff • creation of smokefree 'champions' • campaign and information materials to alert staff and service users of proposed and impending policy changes	If yes, proceed to 5. If no, use EX4 on FT – NOT EXAMINING SMOKEFREE

	• interventions that help people temporarily abstain from smoking whilst onsite. Exclude: activities/interventions that will not be covered • Programmes or interventions exclusively aimed at preventing the uptake of tobacco use. • Programmes or interventions exclusively aimed at supporting tobacco use cessation. Exclude studies that do not mention smokefree legislation or policies or a smokefree intervention(s). Also exclude studies conducted in smokefree contexts and settings but which do not examine smokefree implementation process and effect.	
5. SECONDARY CARE: Was the study conducted in a secondary care setting or with secondary care staff, users or visitors?	Include studies where the smoking policy is conducted in a mental health, acute or maternity secondary care settings. Also include other settings where secondary care staff undertake their work where second-hand smoke may be present. Secondary care is defined as a service provided by medical specialists who generally do not have first contact with patients—usually referred to by a GP—such as psychiatrist, dermatologist, etc. • Included secondary care settings are the buildings and grounds of hospitals (including accident and emergency departments), psychiatric units, mental health units, secure hospitals, maternity units, outpatient clinics and staff residencies. • The buildings and grounds of prison healthcare units and tertiary care services where secondary healthcare staff are employed, or secondary healthcare is provided, are settings that will be included. • Smokefree legislation in the UK covers enclosed vehicles for paid and voluntary work, thus ambulances and hospital vehicles are also included as settings. Activities/interventions that will not be covered: • Strategies and interventions for ensuring smokefree compliance in primary care settings (e.g., GP surgeries). • Studies looking at policies that apply to public spaces more generally (e.g., national legislation banning smoking in all closed public places) - even if the public spaces might include secondary health care settings.	If yes, proceed to 6. If no, use EX5 on FT – NOT SECONDARY CARE
6. EVALUATION OF EFFECTIVENESS: Does the study evaluate the effectiveness of strategy/ies or intervention/s to support compliance/implementatio	Include evaluations of specific activities or strategies designed to support the compliance with or implementation of smokefree legislation or policies. If the legislation or policy is not explicitly stated, interventions where the removal of second-hand smoke or environmental tobacco smoke is an explicit aim will be included. Examples of interventions include, but are not restricted to: • restrictions to eliminate smoking on hospital and other secondary care properties and estates, both indoors and outdoors, including signage and enforcement • restrictions on staff smoking breaks	If yes proceed to 7 If no, use Rev 6:EX6 on FT – NOT EVALUATION OF EFFECTIVENESS. Then proceed to 8.

n of smokefree legislation/policies?	• revised job descriptions to include policy enforcement by staff • creation of smokefree 'champions' • campaign and information materials to alert staff and service users of proposed and impending policy changes • interventions that help people temporarily abstain from smoking whilst onsite. Activities/interventions that will not be covered • Programmes or interventions exclusively aimed at preventing the uptake of tobacco use. • Programmes or interventions exclusively aimed at supporting tobacco use cessation. Exclude studies that do not evaluate a strategy or intervention to support compliance or implementation with smokefree legislation or policy.	
7. RESEARCH DESIGN: Is the study design a comparison (e.g., controlled trials, before-and-after)?	The study must be a comparison design. Eligible comparison designs: guidelines (including NICE guidelines), randomised controlled trials, controlled trials, controlled before and after studies, interrupted time series, and uncontrolled before and after studies. Any studies without these research designs (e.g., single case studies) should be excluded at this stage. However retrospective comparison studies which include self-report behaviour and/or perceptions of compliance post-implementation could provide a valid measure of effectiveness and should be marked so they can be retrieved for Review 6 later if deemed necessary.	If yes, use Rev 6:IN1 on FT – EFFECTIVENESS REVIEW. Then proceed to 8. If no, use Rev 6:EX7 on FT – NOT RESEARCH DESIGN & mark if retrospective comparison study and proceed to 8.
Marker 2: Retrospective comparison	*Retrospective comparison study which includes self-report behaviour and/or perceptions of compliance post-implementation provide a less robust yet valid measure of effectiveness.* *These studies should be given a marker so they can be retrieved for Review 6 later if deemed necessary*	
8. COUNTRY: Was the study conducted in a high income country(ies)?	Include any study that was conducted in a high income country(ies). High income countries are: Andorra, Aruba, Australia, Austria, Bahamas, The, Bahrain, Barbados, Belgium, Bermuda, Brunei Darussalam, Canada, Cayman Islands, Channel Islands, Croatia, Curaçao, Cyprus, Czech Republic, Denmark, Equatorial Guinea, Estonia, Faeroe Islands, Finland, France, French Polynesia, Germany, Gibraltar, Greece, Greenland, Guam, Hong Kong SAR, China, Hungary, Iceland, Ireland, Isle of Man, Israel, Italy, Japan, Korea, Rep., Kuwait, Liechtenstein, Luxembourg, Macao SAR, China, Malta, Monaco, Netherlands, New Caledonia, New Zealand, Northern Mariana Islands, Norway, Oman, Poland, Portugal, Puerto Rico, Qatar, San Marino, Saudi Arabia, Singapore, Sint Maarten (Dutch part), Slovak Republic, Slovenia, Spain, St. Martin (French part), Sweden, Switzerland, Trinidad and Tobago, Turks and Caicos Islands, United Arab Emirates, United Kingdom, United States, Virgin Islands (U.S.)	If yes, proceed to 9 If no, use Rev7:EX8 on FT – NOT HI COUNTRY

	If a study was conducted in a mixture of high and non-high income countries, include the study. Exclude studies conducted in countries not in this list.	
9. BARRIERS/FACILITATORS: Does the document include barriers or facilitators (including knowledge, attitudes and beliefs) to implementing or complying with smokefree policies/legislation or smokefree interventions?	Include if the document includes barriers or facilitators (including knowledge, attitudes and beliefs) to implementing or complying with smokefree policies/legislation or smokefree interventions. The study must include qualitative and/or quantitative evidence of views and opinions – questionnaire surveys, process evaluations and qualitative studies. This includes trials (controlled and non-controlled), descriptive studies (including questionnaire surveys, and process evaluations), qualitative studies (including, but not restricted to, ethnographies, phenomenologies, and grounded theory studies), discussion papers or reports, and 'views studies' (which are written based on a multiple perspective approach with an emphasis on guidance for health professionals) Relevant data may come from papers from process or implementation issues encountered in trials.	If yes, use Rev 7:IN2 on FT – BARRIERS/FACILITATORS REVIEW. If no, use Rev 7:EX9 on FT – NO BARRIERS/FACILITATORS End of criteria.
QUERY on FT	Query for team discussion	
Marker 3	*Smoking cessation interventions in acute & maternity care*	
Marker 4	*Smoking cessation interventions in mental health care*	
Marker 5	*Cost-effectiveness*	
Marker 6	*Useful background information*	

APPENDIX 6: Quality Assessment Details for Review 7 Included Studies

Theoretical approach

1. Is a qualitative approach appropriate? (a Appropriate, b Inappropriate, c Not sure)
2. Is the study clear in what it seeks to do? (a Clear, b Unclear, c Mixed)

Study design

3. How defensible/rigorous is the research design/methodology? (a Defensible, b Indefensible, c Not sure)

Data collection

4. How well was the data collection carried out? (a Appropriately, b Inappropriately, c Not sure/inadequately reported)

Trustworthiness

5. Is the role of the researcher clearly described? (a Clearly described, b Unclear, c Not described)
6. Is the context clearly described? (a Clear, b Unclear, c Not sure)
7. Were the methods reliable? (a Reliable, b Unreliable, c Not sure)

Analysis

8. Is the data analysis sufficiently rigorous? (a Rigorous, b Not rigorous, c Not sure/not reported)
9. Are the data 'rich'? (a Rich, b Poor, c Not sure/not reported)
10. Is the analysis reliable? (a Reliable, b Unreliable, c Not sure/not reported)
11. Are the findings convincing? (a Convincing, b Not convincing, c Not sure)
12. Are the findings relevant to the aims of the study? (a Relevant, b Irrelevant, c Partially relevant)
13. Conclusions (a Adequate, b Inadequate, c Not sure)

Ethics

14. How clear and coherent is the reporting of ethics? (a Appropriate, b Inappropriate, c Not sure/not reported)

Overall assessment

15. As far as can be ascertained from the paper, how well was the study conducted?

++ *All or most of the checklist criteria have been fulfilled, where they have not been fulfilled the conclusions are very unlikely to alter.*

+ *Some of the checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter.*

- *Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.*

NR not reported

NA not applicable

Title	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Arack (2009)	a	a	c	c	c	b	c	c	b	c	c	a	a	a	-
Campion (2008)	a	a	b	c	c	a	c	c	a	c	a	a	a	c	+
Cooke (1991)	c	b	b	c	c	c	c	c	b	c	c	a	a	c	- *This paper is a case study, with no methodology reported, so it has achieved a low score on these criteria. Despite this, it still has some interesting barriers and facilitators information.*
Drach (2012)	a	b	c	c	b	b	c	c	b	c	c	a	a	a	-
Fitzpatrick (2009)	a	a	c	c	c	b	c	c	a	c	a	a	a	a	+ *Methodology not described.*
HUG (2007)	a	a	b	c	c	b	c	c	a	c	c	a	a	c	-
Jessup (2007)	a	a	a	a	c	a	a	a	a	a	a	a	a	a	++
Johnson (2010)	a	a	a	a	a	a	a	a	a	a	a	a	a	a	++
Karan (1993)	a	b	b	c	c	b	c	c	a	c	c	c	a	c	-
Kotz (1993)	c	b	c	c	c	b	c	c	c	c	c	c	a	c	-

															This is a case study with no information on data collection, study methodology, so it scores low on these criteria, however it does have useful barriers and facilitators information.
McNeill (2007)	a	a	c	c	c	b	c	c	c	c	a	a	a	a	+
Mental Health Foundation (2009)	a	c	c	b	c	c	c	c	a	c	a	a	a	c	+ *Although the methodology is flawed, the data is rich.*
Parle (2004)	c	b	c	c	c	b	c	c	a	c	c	a	c	c	- *This is a case study, so it has not scored very highly on these criteria, but it has useful barriers and facilitators data.*
Patterson (2008)	a	b	a	a	a	a	a	a	a	a	a	a	a	a	++
Pritchard (2008)	a	a	a	a	a	a	a	a	a	a	a	a	a	a	++
Ratschen (2008)	a	a	c	c	c	b	a	c	a	c	a	a	a	a	+
Ratschen (2009a)	a	a	a	a	a	a	a	a	a	a	a	a	a	a	++
Ratschen (2010)	a	a	a	a	a	a	a	a	a	a	a	a	a	a	++
Schultz (2011)	a	a	a	a	b	b	a	a	a	a	a	a	a	a	++
Seymour (2000)	a	c	c	c	c	b	c	c	a	c	a	a	a	c	-
Sheffer (2009)	a	c	a	a	c	b	c	c	b	c	c	a	a	a	+
Tillgren (1998)	a	c	c	c	c	b	c	c	b	c	a	a	a	c	-
Wareing (2012)	a	a	c	c	a	b	c	c	b	c	c	a	a	c	+
Wheeler (2007)	a	c	c	c	c	b	c	c	b	c	a	a	a	a	-

1.1 Is the source population or source area well described?
1.2 Is the eligible population or area representative of the source population or area?
1.3 Do the selected participants or areas represent the eligible population or area?
2.1 Selection of exposure (and comparison) group. How was selection bias minimised?
2.2 Was the selection of explanatory variables based on a sound theoretical basis?
2.3 Was the contamination acceptably low?
2.4 How well were likely confounding factors identified and controlled?
2.5 Is the setting applicable to the UK?
3.1 Were the outcome measures and procedures reliable?
3.2 Were all outcome measurements complete?
3.3 Were all the important outcomes assessed?
3.4 Was there a similar follow-up time in exposure and comparison groups?
3.5 Was follow-up time meaningful?
4.1 Was the study sufficiently powered to detect an intervention effect (if one exists)?
4.2 Were multiple explanatory variables considered in the analyses?
4.3 Were the analytical methods appropriate?
4.4 Was the precision of association given or calculable? Is association meaningful?
5.1 Are the study results internally valid (i.e. unbiased)?
5.2 Are the findings generalisable to the source population (i.e. externally valid)?

++ for that aspect, the study has been designed/conducted in such a way as to minimise the risk of bias
+ the answer is not clear from the way the study is reported, or that the study may not have addressed all potential sources of bias for that aspect
– for those aspects of the study design in which significant sources of bias may persist
NR not reported
NA not applicable

Title	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	3.1	3.2	3.3	3.4	3.5	4.1	4.2	4.3	4.4	5.1	5.2
Arack (2009)	+	NA	NR	NA	NA	NA	NA	++	-	+	+	NA	NA	NR	NA	NR	NA	-	-
Baile (1991)	++	-	NR	NA	NA	NA	NA	-	+	+	NA	NA	NA	NA	NA	NR	NA	+	-
Bloor (2006)	++	++	+	NA	NA	NA	NR	++	+	+	+	NA	NA	NR	NA	-	-	+ *Limited reporting of analysis and any confounders makes internal validity unclear; no control group.*	+ *Source population's demographics provided - excluding smoking behaviour.*
Cormac (2010)	+	++	+	NA	NA	NA	NR	++	+	++	++	NA	++	NR	NA	++	+	+	+
Daughton (1992)	-	++	-	NA	NA	NA	NR	-	-	+	+	NA	+	NR	NA	++	++	- *demographic data not collected; no control group*	- *source population not described; potential selection/respondent bias*
Donchin (2004)	++	+	++	NA	NA	NA	NR	+	+	NR	+	NA	+	NR	NA	++	++	+ *no control group for temporal confounders*	+
Erwin	++	++	+	NA	NA	NA	NR	-	-	NR	+	NA	+	NR	NA	NR	NR	-	+

(1991)																		*Data analysis unreported*	
Etter (2008)	++	++	+	NA	NA	NA	NR	+	-	+	+	NA	+	-	NA	+	++	+ *follow-up measures taken 3-5 months post-total ban, subject selection was consistent with no significant diffs btw group demogs*	+ *Small sample size*
Fitzpatrick (2009)	++	+	+	NA	NA	NA	NA	++	+	+	NA	NA	NA	NA	NA	NR	NA	+	+
Garg (2009)	++	+	+	NA	NA	NA	NR	++	-	++	+	NA	NA	NR	NA	-	+	+ *Reliability and validation of outcome measures limited; social desirability/interviewer bias may be a factor; no control group.*	+ *No demographics for non-responders but self-report smoking rates of respondents (30%) slightly higher than UK general population.*
Haller (1996)	+	++	++	+	NA	NA	NR	-	+	NR	+	NA	++	NR	NA	++	++	+ *Risk self-selection bias, unvalidated outcome measures, no control group*	+
Hill (2007)	++	++	++	NA	NA	NA	NA	++	+	+	NA	NA	NA	NA	NA	+	NA	++	++
Hudzinski (1990)	+	++	-	NA	NA	NA	-	+	+	NR	+	NA	+	NR	NA	+	-	+ *Same sample but may have become desensitised to questionnaire; no control group*	+
Jones (2010)	+	++	++	NA	NA	NA	NA	+	+	NA	NA	NA	NA	NA	NA	NR	NA	+	+
Kannegaard (2005)	++	++	++	NA	NA	NA	NA	+	++	NA	NA	NA	-	NR	NA	++	NA	++	++
Lewis (2011)	-	++	-	NA	NA	NA	NA	++	+	NA	NA	NA	NA	NA	NA	++	NA	+	+
Matthews (2005)	+	-	-	NA	NA	NA	NR	-	-	NR	+	NA	++	NR	NA	++	++	- *Paper lacks detail on methods/analysis to answer this*	- *Patient source population possibly; no details to assess this for staff source population*
Parks (2009)	++	++	++	NA	NA	NA	NA	++	++	-	NA	NA	NA	NA	NA	++	NA	+	++
Patten (1995)	+	++	-	NA	NA	NA	NR	+	+	NR	+	NA	++	NR	NA	++	++	+ *risk self-selection bias, unvalidated outcome measures, no control group*	+ *patient chart data possibly, not staff and patient survey results*
Praveen (2009)	-	NR	-	NA	NA	NA	NA	++	++	NA	NA	NA	NA	NA	NA	NR	NA	+	-
Ratschen	++	++	+	NA	NA	NA	NR	++	-	+	+	NA	NA	NR	NA	NR	-	+	+

(2008)																		*Possible respondent reporting bias*	*reasonable interview and survey response rate however based on 1 employee's observations per hospital (survey); triangulated study design*
Ratschen (2009b)	++	++	+	NA	NA	NA	NA	++	++	NA	NA	NA	NA	NA	NA	++	NA	++	++
Rosen (1995)	++	++	+	NA	NA	NA	NR	+	-	++	+	NA	NA	NR	NA	++	++	+ *Potential self selection bias; no control group for temporal confounders*	+
Sheffer (2009)	+	++	NR	NA	NA	NA	NA	-	++	++	NA	NA	++	NA	NA	++	NA	+	+
Shipley (2008)	++	+	++	NA	NA	NA	NR	++	+	++	++	NA	NA	NR	NA	+	+	+ *No control group for temporal trends*	+ *100% participation, full time acute nursing & medical staff only*
Smith (2008)	+	++	++	NA	NA	NA	NA	++	+	NA	NA	NA	NA	NA	NA	++	NA	+	++
Steiner (1991)	+	+	+	NA	NA	NA	NA	-	NR	NA	NA	NA	++	NA	NA	NR	NA	+	+
Steiner (2009)	+	++	+	NA	NA	NA	NA	-	+	-	NA	NA	NA	NA	NA	++	NA	+	+
Stillman (1995)	++	++	+	NR	+	NA	+	+	+	-	+	NA	+	++	+	++	+	+ *That the participants were recruited from a smoking cessation counselling programme*	+
Ullén (2002)	+	+	+	NA	NA	NA	NA	+	+	NA	NA	NA	NA	NR	NA	NR	NA	+	+
Vardavas (2009)	++	+	+	NA	NA	NA	NR	-	-	++	+	NA	NA	NR	NA	+	-	- *Self report smoking, other measures not validated, few p values reported, no control group*	+ *non full-time staff excluded*
Voci (2010)	+	++	-	NA	NA	NA	NA	-	++	NA	NA	NA	NA	NA	NA	++	NA	++	-
Wheeler (2007)	+	++	+	NA	NA	NA	NR	+	+	NR	+	NA	+	NR	NA	++	-	- *Limited reporting as many measures/parts to the study; self-selection bias; no control group*	+
Wye (2010)	++	++	+	NA	NA	NA	NA	+	++	NA	NA	NA	NA	NA	NA	++	NA	++	++

APPENDIX 7: Evidence Tables for Review 7 Included Qualitative Studies

Study details	Research parameters	Population and sample selection	Smokefree	Outcomes and methods of analysis	Results	Notes
Authors *Arack et al* **Year** 2009 **Aim of study** *To explore the effects of a complete smoking ban at an NHS trust, focusing on the attitudes, compliance and smoking behaviour of NHS staff on the smoke-free NHS policy.* **Study design** Cross-sectional study **Quality score** -	**What was/were the research questions:** Not reported **What theoretical approach does the study take:** Not stated **Setting** *Isle of Wight NHS Acute Trust.* **How were the data collected: What method(s):** Questionnaires: open-ended questions **When:** Not stated **By Whom:** Not stated	**Country** England **Secondary Care Setting** Both **What population were the sample recruited from:** Staff *11,000 NHS Acute Trust staff* **Source population demographics** Occupation *Acute Trust staff* **How were they recruited:** *'Opportunity sample'. Participants recruited through hospital wards and departments that demonstrated an interest in taking part.* **How many participants were recruited:** Total sample *n=160* *89% female.* *91% Caucasian, 4.5% Asian-Indian, 1.3% Asian-other, 1.3% black African, 0.6% other.* *48.4% never smokers, 27% ex-smokers, 19.5% smokers, 5% occasional smokers.*	**Smokefree: Implementation stage:** Smokefree in place *January 2006* **Fieldwork stage:** After implementation – single time-point *May 2007* **Where:** Not reported **Coverage:** Not reported **Supporting strategies:** Not reported	**Brief description of method and process of analysis:** *Thematic analysis*	**Key themes/findings relevant to this review: Attitudes to smokefree** Staff **Beliefs - people's rights** Smokers' right to smoke **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree results in changed patient aggression/management issues" **Planning & resource issues** Staff workload/resourcing Smoking cessation services **Other factors** Safety issues	**Limitations identified by author(s):** *Possibility of participation bias. Limited sample size.* *No objective measures of health behaviour.* **Recommendations for future research:** *Further research on the effects of the smoking ban: objective measures of health and focus groups to collect information on attitudes, compliance and health behaviour of NHS staff.* *Studies targeting different ethnic groups.* *Development of a standardised attitude scale on smoking behaviour to help support and evaluate workplace smokefree policies.* **Source of funding:** Not reported

		Occupational groups: 38% nursing, 30.9% admin/clerical, 17.8% allied health professions, 2.0% science and professional, 5.3% technical, 3.9% medical, 1.3% auxiliary. **Were there specific inclusion/exclusion criteria:** Inclusion criteria not reported Exclusion criteria not reported % participation agreement *45%*				
Authors *McNeill, Bauld & Ferguson* **Year** 2007 **Aim of study** *To summarise available evidence on tobacco use and tobacco-related harm in psychiatric services.* *To explore the views of stakeholders.* *To examine how different services across the UK had addressed the range of issues around smoking in*	**What was/were the research questions:** Not reported **What theoretical approach does the study take:** Case study(ies) **Setting** *Mental health services in Scotland.* **How were the data collected: What method(s):** Interviews Observation **When:** Not stated **By Whom:** Not stated	**Country** Scotland **Secondary Care Setting** Mental Health **What population were the sample recruited from:** Staff *Professionals involved in managing, delivering or supporting mental health services in Scotland.* **Source population demographics** Occupation *Professionals involved in managing, delivering or supporting mental health services in*	**Smokefree: Implementation stage:** *Recent UK mental health setting* **Fieldwork stage:** Before implementation – single time-point *December 2006-March 2007* After implementation – single time-point *Only for case studies* **Where:** Mental Health **Coverage:** *Not applicable.*	**Brief description of method and process of analysis:** *Detailed notes were taken during and following each interview. These notes formed the basis for thematic data analysis with the framework approach commonly used in applied policy research.*	**Key themes/findings relevant to this review: Attitudes to smokefree** Staff **Beliefs - people's rights** Smokers' right to smoke **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree results in changed patient aggression/management issues" "Smokefree results in changed medication issues" "Smokefree affects patient recruitment & retention" "Smokefree affects staff"	**Limitations identified by author(s):** *Findings based on expectations not experiences and limited to staff views - no client perspective provided* **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Government

mental health services. **Study design** Case study Interview study **Quality score** +		*Scotland.* **How were they recruited:** *Interviewees were identified by colleagues in Health Scotland and the Scottish Executive.* **How many participants were recruited:** Total sample *Key informant interviews: 11 health professionals* *Case study interviews: Interviews with various staff members.* **Were there specific inclusion/exclusion criteria:** Inclusion criteria not reported Exclusion criteria not reported % participation agreement not reported			Other views on smokefree effects **Planning & resource issues** Staff workload/resourcing Staff training Smoking cessation services Pharmacotherapies Planning/Timing-specific issues Other planning & resource issues **Communication issues** Availability of information **Other factors** Safety issues Other	
Authors *Campion et al* **Year** 2008 **Aim of study** *The aim of the paper is to describe the introduction, trial and termination of a smoke-free policy in an acute mental health unit of a regional hospital,*	**What was/were the research questions:** Not reported **What theoretical approach does the study take:** Not stated **Setting** *Mental health unit with 8 high dependency beds (locked, involuntary patients) and 26 low dependency beds (open, voluntary and involuntary*	**Country** Australia **Secondary Care Setting** Mental Health **What population were the sample recruited from:** *Key informants* **Source population demographics** None reported **How were they recruited:** Not reported	**Smokefree: Implementation stage:** *Smokefree policy trialled and terminated.* **Fieldwork stage:** After implementation – single time-point **Where:** Mental Health **Coverage:** Smokefree building(s) **Supporting strategies:** Written policy(ies)	**Brief description of method and process of analysis:** *Not reported*	**Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree results in changed patient aggression/management issues" "Smokefree affects patient recruitment & retention" **Planning & resource issues** Staff workload/resourcing Staff training	**Limitations identified by author(s):** None identified by author(s) **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Not reported

and to consider factors that may contribute to the success of such policies in other settings. **Study design** Interview study Document/Content analysis *Review of correspondence relating to the trial.* **Quality score** +	*patients). The mental health unit is part of a Queensland regional hospital.* **How were the data collected: What method(s):** Interviews *Key informant interviews* Other *Review of correspondence related to the smoke free trial* **When:** Not stated **By Whom:** Not stated	**How many participants were recruited:** Not reported **Were there specific inclusion/exclusion criteria:** Inclusion criteria not applicable Exclusion criteria not applicable % participation agreement not reported	Implementation committee *steering group* Pharmacotherapies/NRT *for staff* Other *support and information sessions for patients*		Other planning & resource issues **Other factors** Safety issues	
Authors *Cooke* **Year** 1991 **Aim of study** *Not reported* **Study design** Case study **Quality score** - Comments (write in)	**What was/were the research questions:** Not reported **What theoretical approach does the study take:** Case study(ies) **Setting** *20-bed acute inpatient psychiatric unit.* **How were the data collected: What method(s):** Not stated **When:** Not stated **By Whom:** Not stated	**Country** Canada **Secondary Care Setting** Mental Health	**Smokefree: Implementation stage:** Smokefree in place **Fieldwork stage:** After implementation – single time-point **Where:** Mental Health **Coverage:** Smokefree building(s) **Supporting strategies:** Not reported	**Brief description of method and process of analysis:** *Not reported*	**Key themes/findings relevant to this review: Attitudes to smokefree** Staff **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree results in changed patient aggression/management issues" Other views on smokefree effects	**Limitations identified by author(s):** None identified by author(s) **Limitations identified by review team:** *This paper is a case study, with no methodology reported, so it has achieved a low quality appraisal score.* **Evidence gaps and/or recommendations for future research:** None reported

						Source of funding: Not reported
Authors *Drach, Morris, Cushing, Romoli and Harris* **Year** 2012 **Aim of study** *To assess current tobacco-related policies and procedures at all state-funded, mental health and drug addiction residential treatment facilities before policy implementation.* **Study design** Cross-sectional study **Quality score** -	**What was/were the research questions:** Not reported **What theoretical approach does the study take:** Not stated **Setting** *State-funded, mental health and drug addiction residential treatment facilities.* **How were the data collected: What method(s):** Interviews **When:** Not stated **By Whom:** *Public health staff*	**Country** USA **Secondary Care Setting** Mental Health **What population were the sample recruited from:** *Treatment facility administrators* **Source population demographics** Occupation *Treatment facility administrators.* **How were they recruited:** *Two weeks before survey implementation, a memorandum was sent to treatment facility administrators, informing them of the upcoming survey and requesting their participation.* **How many participants were recruited:** Total sample *Administrators from 163 facilities.* **Were there specific inclusion/exclusion criteria:** Inclusion criteria *Administrators from community-based residential treatment facilities for mental health*	**Smokefree: Implementation stage:** Smokefree impending **Fieldwork stage:** Before implementation – single time-point **Where:** Mental Health **Coverage:** Smokefree building(s) Smokefree grounds **Supporting strategies:** Not reported	**Brief description of method and process of analysis:** *Brief answers from the open-ended item grouped into broad themes using content analysis.*	**Beliefs - people's rights** Smokers' right to smoke **Planning & resource issues** Smoking cessation services Other planning & resource issues	**Limitations identified by author(s):** *'Although assured confidentiality, facility administrators may have overstated the presence of smoke-free policies. Also, strong written policies are not always demonstrated in daily practice; these data should not be assumed to reflect enforcement, compliance, or non-administrative staff support.* **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Government

		and addiction in Oregon. Exclusion criteria not reported % participation agreement *98%*				
Authors *Fitzpatrick et al* **Year** 2009 **Aim of study** *To assess patient and staff attitudes to the 2004 indoor smoking ban, and its implications for smoking management.* **Study design** Cross-sectional study Interview study **Quality score** +	**What was/were the research questions:** Not reported **What theoretical approach does the study take:** Not stated **Setting** *Acute general hospital with between 350 and 520 in-patient beds.* **How were the data collected: What method(s):** Interviews *Patient interviews average 5 min; Staff interviews average 15 min.* **When:** Not stated **By Whom:** Not stated	**Country** Ireland **Secondary Care Setting** Both **What population were the sample recruited from:** Patients Staff **Source population demographics** Smoking status *smoking patients and patients using smoking cessation services* **How were they recruited:** *Half of patients recruited outdoors in smoking shelters, and the remainder recruited through ward smoking cessation services.* **How many participants were recruited:** Total sample *30 patients, 28 staff members.* **Were there specific inclusion/exclusion criteria:** Inclusion criteria not	**Smokefree: Implementation stage:** Smokefree in place *Indoor ban implemented in 2004.* Smokefree impending *Campus wide ban to be implemented in 2009.* **Fieldwork stage:** After implementation – single time-point *2005* **Where:** Not reported **Coverage:** Smokefree building(s) Smokefree grounds *Due to be implemented in 2009.* **Supporting strategies:** Not reported	**Brief description of method and process of analysis:** *Not reported.*	**Key themes/findings relevant to this review: Attitudes to smokefree** Patients **Other factors** Safety issues	**Limitations identified by author(s):** None identified by author(s) **Limitations identified by review team:** *Methodology not described.* **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Government

		reported Exclusion criteria not reported % participation agreement not reported				
Authors *HUG Highland Users Group* **Year** 2007 **Aim of study** *To explore the feelings of the Highland Users Group about the [public smoking] ban, and to explore their views on the possibility of Psychiatric Hospitals becoming smoke free.* **Study design** *Discussion meetings.* **Quality score** -	**What was/were the research questions:** Not reported **What theoretical approach does the study take:** Not stated **Setting** *Highland Users Group, a network of people who use, or have used, mental health services in the Highlands* **How were the data collected: What method(s):** *Discussion meetings.* **When:** *August 2006* **By Whom:** Not stated	**Country** Scotland **Secondary Care Setting** Mental Health **What population were the sample recruited from:** Patients *People who use, or have used, mental health services in the Highlands* **Source population demographics** None reported **How were they recruited:** Not reported **How many participants were recruited:** Total sample *n=85* **Were there specific inclusion/exclusion criteria:** Inclusion criteria not applicable Exclusion criteria not applicable % participation agreement not reported	**Smokefree: Implementation stage:** *Psychiatric units exempt from smoking ban at the time of the study.* **Fieldwork stage:** Before implementation – single time-point **Where:** Mental Health **Coverage:** *Psychiatric units exempt from smoking ban.* **Supporting strategies:** *Not applicable*	**Brief description of method and process of analysis:** *Not reported.*	**Key themes/findings relevant to this review: Attitudes to smokefree** Patients **Beliefs - people's rights** Smokers' right to smoke **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree affects patients' mental health" "Smokefree results in changed patient aggression/management issues" "Smokefree affects patient recruitment & retention" **Planning & resource issues** Smoking cessation services Planning/Timing-specific issues **Other factors** Safety issues	**Limitations identified by author(s):** None identified by author(s) **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Voluntary/Charity
Authors *Jessup*	**What was/were the research questions:**	**Country** USA	**Smokefree: Implementation stage:**	**Brief description of method and process of**	**Key themes/findings relevant to this review:**	**Limitations identified by**

Year 2007 **Aim of study** *Aims of the case study were to examine program characteristics affecting organizational change in tobacco policy and clinical practice and explore perinatal-specific motivators for change.* **Study design** Interview study *face-to-face semi-structured interview* **Quality score** ++	Not reported **What theoretical approach does the study take:** Case study(ies) **Setting** *Women's Recovery Service is a residential perinatal drug and alcohol treatment and recovery services program with a 90 day residential treatment component, after care and transitional housing. It has capacity for 20 pregnant and/or parenting women and 12 children ages 0 to 11 years.* **How were the data collected: What method(s):** Depth interviews (one-to-one) *1 hour* **When:** Not stated **By Whom:** Not stated	**Secondary Care Setting** Mental Health **What population were the sample recruited from:** Staff *Executive Director and Programme Staff* **Source population demographics** None reported **How were they recruited:** Recruitment method *All staff invite to participate* **How many participants were recruited:** Total sample *8: Executive Director; Medical Director; Nurse; Therapist; Child Care Director; Case Manager x 2; Intake Specialist.* **Were there specific inclusion/exclusion criteria:** Inclusion criteria not applicable Exclusion criteria not applicable % participation agreement *73% (three overnight staff declined to take part due to time inconvenience).*	Smokefree in place **Fieldwork stage:** After implementation – single time-point **Where:** Mental Health **Coverage:** *Clients were required to abstain from cigarette smoking entirely while enrolled in the residential program, including during passes to outside appointments, events, and family or child visitation.* **Supporting strategies:** Posters/signage Cessation support Pharmacotherapies/NRT Removal from treatment (patient) *This practice was eliminated after a few weeks.* Other *Sanctions (reduction of privileges, loss of pass) for tobacco use accompanied by increase in therapeutic interventions (e.g. homework, reading). Educational materials. Client verbal agreement signature on a non-smoking statement of understanding. Pre-admission notification*	**analysis:** *Interviews audio-recorded and transcribed then coded.* *A total of 81 codes emerged, and transcripts were coded using them. Analysis was conducted using a theoretical analytic framework. The framework was composed of organizational domains, including organizational readiness and climate, staff attributes, and agency resources.*	**Attitudes to smokefree** Other group **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree affects patient recruitment & retention" Other views on smokefree effects **Planning & resource issues** Staff workload/resourcing Smoking cessation services Other planning & resource issues	**author(s):** *Results derived from examination of a single program and generalise only to that program. Sample selection limited to staff members employed at the program at the time the study was conducted. Recall bias and pro-innovation bias may have altered or omitted significant facts of the story of organisational change as reported by the respondents.* **Recommendations for future research:** *Theoretical models of organizational change do not specifically conceptualize stigma or controversy attached to an innovation, therefore development of theoretical models that account for the status of an innovation as disputed would be especially relevant for understanding*

			to clients and referral sources regarding the program's tobacco policy and treatment. Placement of the phrase "nicotine free" in the outgoing message of the program's answering machine and on the WRS program brochure, website, and t-shirts.			*how organizations and individuals interact with controversial technology or tools. While educational level has been described as positively affecting innovation, it would be useful to understand the effects of role diversity on organizational change. Research on the impact of elimination of environmental tobacco smoke and nicotine treatment on paediatric respiratory status of children in residential drug abuse treatment settings could have significant implications for improved health status and cost reduction.* **Source of funding:** Government
Authors *Johnson, Moffat and Malchy* **Year**	**What was/were the research questions:** Not reported **What theoretical**	**Country** Canada **Secondary Care Setting**	**Smokefree: Implementation stage:** Smokefree in place **Fieldwork stage:**	**Brief description of method and process of analysis:** *Discourse analysis*	**Beliefs - people's rights** Smokers' right to smoke **Beliefs - effects of smokefree on patients,**	**Limitations identified by author(s):** *The authors*

2010 **Aim of study** *To examine the perceptions of health care providers, both professionals and paraprofessionals, in relation to their roles in tobacco control in the community mental health system.* **Quality score** ++	**approach does the study take:** Discourse Analysis **Setting** *Two community mental health teams, two community resource centres and two mental health housing units.* **How were the data collected: What method(s):** Depth interviews (one-to-one) **When:** *January-April 2009* **By Whom:** Author/Researcher	Mental Health **What population were the sample recruited from:** Staff **Source population demographics** Occupation *Community mental health care providers: Para-professionals and professionals such as nurses, medics and occupational therapists.* **How were they recruited:** *Not reported* **How many participants were recruited:** Total sample *91: professionals [n = 42] and paraprofessionals [n = 49].* *Over half (63%) of the total sample was female. The average time spent working in the mental health system was 10.3 years and the average time in the current workplace was 4.8 years. Of the 91 participants, 52 were non smokers, 18 were former smokers, 6 were occasional smokers and 15 identified as current smokers.* **Were there specific inclusion/exclusion criteria:**	After implementation – single time-point *January -April 2009* **Where:** Mental Health **Coverage:** Smokefree building(s) Smokefree grounds **Supporting strategies:** Posters/signage Staff training Other (write in) *$2,000 fines for patients*		**staff & visitors** "Smokefree affects patients' mental health" **Planning & resource issues** Staff workload/resourcing Smoking cessation services Pharmacotherapies **Communication issues** Health professional's-Patient's relationship **Other factors** Other	*recognise that any text will only ever convey or produce a partial perspective of reality.* **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Government

		Inclusion criteria not reported Exclusion criteria not reported % participation agreement not reported				
Authors *Karan* **Year** 1993 **Aim of study** *Not reported.* **Study design** Case study **Quality score** -	**What was/were the research questions:** Not applicable **What theoretical approach does the study take:** Case study(ies) **Setting** *Inpatient unit of the Division of Substance Abuse at the Medical College of Virginia. A tertiary care facility serving a primarily indigent population from across the state. The unit specialises in caring for complicated patients who cannot otherwise be served by community resources. These patients typically have late-stage addiction and/or compounding medical, psychiatric and obstetric issues.* **How were the data collected: What method(s):** Not stated **When:** Not stated	**Country** USA **Secondary Care Setting** Mental Health	**Smokefree: Implementation stage:** Smokefree in place **Fieldwork stage:** After implementation – single time-point **Where:** Mental Health **Coverage:** Smokefree building(s) Other *in-patients required to be abstinent from smoking.* **Supporting strategies:** Patient appointment letters Cessation support Pharmacotherapies/NRT Staff training Other *Information sessions and educational materials for staff*	**Brief description of method and process of analysis:** *Not reported.*	**Key themes/findings relevant to this review: Attitudes to smokefree** Staff Other group(s) **Beliefs - people's rights** Smokers' right to smoke **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree results in changed patient aggression/management issues" "Smokefree affects patient recruitment & retention" **Planning & resource issues** Staff workload/resourcing Structural issues Other planning & resource issues **Communication issues** Health professional's-Patient's relationship **Other factors** Safety issues Other	**Limitations identified by author(s):** None identified by author(s) **Evidence gaps:** *Further knowledge about the use of pharmacologic agents including transdermal nicotine, and even possibly nicotine maintenance is needed for persons who are chemically dependent.* **Source of funding:** Not reported

	By Whom: Not stated					
Authors *Kotz* **Year** 1993 **Aim of study** *Case study* **Study design** Case study **Quality score** -	**What was/were the research questions:** Not applicable **What theoretical approach does the study take:** Case study(ies) **Setting** *20-bed chemical dependency unit in a 1,000 bed tertiary care setting.* **How were the data collected: What method(s):** Not stated **When:** Not stated **By Whom:** Not stated	**Country** USA **Secondary Care Setting** Mental Health	**Smokefree: Implementation stage:** Smokefree in place **Fieldwork stage:** After implementation – multiple time-points **Where:** Mental Health **Coverage:** Smokefree building(s) **Supporting strategies:** Cessation support Staff training Removal from treatment (patient) Other *Party to celebrate 'independence from nicotine'.* *Patient lounges equipped with board games etc to encourage patients to come back to the rooms.* *Educational materials for patients about nicotine addiction.*	**Brief description of method and process of analysis:** *Not reported*	**Key themes/findings relevant to this review: Attitudes to smokefree** Other group(s) **Beliefs - people's rights** Smokers' right to smoke **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree affects patient recruitment & retention" Other views on smokefree effects **Planning & resource issues** Smoking cessation services Other planning & resource issues **Communication issues** Health professional's-Patient's relationship **Other factors** Safety issues	**Limitations identified by author(s):** None identified by author(s) **Limitations identified by review team:** *This is a case study with no information on data collection, study methodology, so it has a low quality appraisal score.* **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Not reported
Authors *Mental Health Foundation* **Year** 2009 **Aim of study** *To assess how*	**What was/were the research questions:** *1. Do you believe the smoking ban in psychiatric units has been* *(a) wholly effective* *(b) partially effective* *(c) not effective at all* *2. If (a) above, what have*	**Country** England **Secondary Care Setting** Mental Health **What population were the sample recruited from:** Staff	**Smokefree: Implementation stage:** Smokefree in place *July 2008* **Fieldwork stage:** After implementation – single time-point *Autumn 2008*	**Brief description of method and process of analysis:** *Responses were analysed thematically, with conclusions and recommendations drawn from the findings.*	**Key themes/findings relevant to this review: Attitudes to smokefree** Patients **Beliefs - people's rights** Smokers' right to smoke **Beliefs - effects of smokefree on patients,**	**Limitations identified by author(s):** *No attempt was made to receive responses from all psychiatric units in England, or from a unit within every*

effectively the prohibition on smoking had been implemented (in terms of no smoking in enclosed spaces as required by law), the factors that had led to greater or lesser success and what extra support might be required for full effective implementation **Study design** Cross-sectional study Other *Over and above the returned questionnaires, the Foundation also received a small number of email responses commenting on the issue of smoking in psychiatric units.* **Quality score** +	*been the main factors in achieving this?* *3. If (b) or (c) above, what have been the main factors in the ban not being wholly effective?* *4. What extra support do you think patients and staff need to ensure a wholly effective ban on smoking in psychiatric units?* **What theoretical approach does the study take:** Not stated **Setting** Setting details *psychiatric units* **How were the data collected: What method(s):** Questionnaires: open-ended questions **When:** *Questionnaires were circulated in the last week of October 2008 and responses invited by 27 November 2008.* Not applicable **By Whom:** Not applicable	*Psychiatric unit staff* **Source population demographics** None reported **How were they recruited:** Recruitment method *A short questionnaire was given to members of the National Acute Steering Group, with an invitation to circulate it more widely to psychiatric units (the Steering Group is a sub-group of the National Acute Inpatient Mental Health Project Board, whose core aim is to provide a collective focus between national and local stakeholders on acute inpatient care in England). Through the offices of the National Association of Psychiatric Intensive Care Units (NAPICU) a copy was also circulated to the PICU membership.* **How many participants were recruited:** Total sample *109 surveys from England (100 NHS and 9 private sector).* *NHS responses came from across 40 NHS Trusts.* *[It is possible that a small number of the 100 responses from NHS units in England are from*	**Where:** Mental Health **Coverage:** Smokefree building(s) **Supporting strategies:** Not reported		**staff & visitors** "Smokefree results in changed patient aggression/management issues" Other views on smokefree effects **Planning & resource issues** Staff workload/resourcing Smoking cessation services Structural issues Other planning & resource issues **Communication issues** Availability of information Staffs' familiarity/understanding of policy Health professional's-Patient's relationship Other communication issues **Other factors** Safety issues	*NHS mental health trust (of 75 NHS mental health trusts in England, response were received from units within 40 of them). The questionnaire relied on its circulation by members of the National Acute Steering Group and NAPICU, and contained no obligation to respond. The findings therefore represent a snapshot as at the end of November 2008, some five months after the smoking prohibition had come into effect.* *Other than some of the questionnaires being sent specifically to PICUs, information was not sought on the type, size or layout of unit that was responding. It is likely that the nature of different units (for example, the level of illness of patients in different units,*

		different staff in the same unit, ie responses came from fewer than 100 NHS units.] **Were there specific inclusion/exclusion criteria:** Inclusion criteria not applicable Exclusion criteria not applicable % participation agreement not reported *It is not reported/known how many units the questionnaire was distributed to.*				*length of patient stay in a unit, level of security, and physical layout of the unit) will impact on how effective the ban has been, but no analysis of this was possible.* *No record was kept of which units received a copy of the questionnaire nor which member of staff.* *Respondents were not asked to state their job title or responsibilities. Some did, however, suggesting that the majority of responses were completed by ward staff and ward managers with a few completed by consultant psychiatrists or hospital or Trust managers. Nor were respondents asked to state whether they were themselves smokers or not, which may have been influential in determining their replies. What was*

						and what wasn't considered "effective" may have been interpreted differently by different respondents – indeed, two respondents specifically queried what "effective" meant. A number of respondents indicated that their comments were given in a personal capacity rather than an organisational one. **Limitations identified by review team:** *Although the methodology is flawed, the data is rich.* **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Voluntary/Charity
Authors *Parle et al* **Year** 2004	**What was/were the research questions:** Not reported **What theoretical approach does the study**	**Country** Canada **Secondary Care Setting** Mental Health	**Smokefree: Implementation stage:** Smokefree in place *Ban in place from May 2003*	**Brief description of method and process of analysis:** *Not reported*	**Key themes/findings relevant to this review: Attitudes to smokefree** Staff Patients	**Limitations identified by author(s):** None identified by author(s)

Aim of study *To discuss the operational, health and safety, clinical and ethical issues surrounding the decision of a mental health centre to go smokefree.* **Study design** Case study **Quality score** -	**take:** Case study(ies) **Setting** *291 bed psychiatric hospital* **How were the data collected: What method(s):** Not stated **When:** Not stated **By Whom:** Not stated		**Fieldwork stage:** After implementation – single time-point **Where:** Mental Health **Coverage:** Smokefree building(s) Smokefree grounds **Supporting strategies:** Posters/signage Cessation support *Financial support package to assist staff with the purchase of cessation aids.* Pharmacotherapies/NRT Other *Self-help materials.* *Contests to promote awareness and voluntary cessation.* *Extra recreational activities to assist in avoiding boredom and inactivity in the three to four weeks following implementation of the ban.* *Low calorie snacks were provided to assist with cravings and to discourage snacking on high calorie foods.*		Other group(s) **Beliefs - people's rights** Smokers' right to smoke **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree affects patients' mental health" "Smokefree results in changed patient aggression/management issues" "Smokefree results in changed medication issues" "Smokefree affects patient recruitment & retention" Other views on smokefree effects **Planning & resource issues** Other planning & resource issues **Communication issues** Availability of information **Other factors** Safety issues	**Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Not reported
Authors *Patterson et al* **Year** 2008	**What was/were the research questions:** Not reported *The interviews focused on the security staff*	**Country** Canada **Secondary Care Setting** Both	**Fieldwork stage:** After implementation – single time-point *March- July 2002*	**Brief description of method and process of analysis:** *Thematic analysis.*	**Communication issues** Health professional's-Patient's relationship	**Limitations identified by author(s):** *'Although researcher selected*

Aim of study *To explore the occupational culture of hospital security staff tasked with implementing a restrictive smoking policy.* **Study design** Interview study Participant observation **Quality score** ++	*members' attitudes toward enforcing the new tobacco policy* **What theoretical approach does the study take:** Ethnography **Setting** *A 700-bed hospital with 7,500 staff.* **How were the data collected: What method(s):** Depth interviews (one-to-one) *30 min-1 hour* Observation **When:** Working hours/Work break **By Whom:** Author/Researcher	**What population were the sample recruited from:** Staff *Hospital security staff* **Source population demographics** Occupation *Security staff* **How were they recruited:** *Opportunistic* **How many participants were recruited:** Total sample *Total: 19* *Full time staff: 12* *Part time staff: 3* *Supervisors: 4* **Were there specific inclusion/exclusion criteria:** Inclusion criteria not applicable Exclusion criteria not applicable % participation agreement not reported	**Where:** Both **Coverage:** Smokefree building(s) **Supporting strategies:** Not reported			*days and times when observations were conducted, he could not be sure that specific members of staff would be available to participate.'* **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Government
Authors *Pritchard & McNeill* **Year** 2008 **Aim of study** *To investigate the implementation of a smoke-free policy for buildings and grounds in a large*	**What was/were the research questions:** Not reported **What theoretical approach does the study take:** Not stated **Setting** *A large mental health trust in England. The trust*	**Country** England **Secondary Care Setting** Mental Health **What population were the sample recruited from:** Staff Other(s) *patient advocates*	**Smokefree: Implementation stage:** Smokefree in place **Fieldwork stage:** After implementation – single time-point *March 2007* **Where:** Mental Health **Coverage:**	**Brief description of method and process of analysis:** *Interviews were digitally recorded (except where participants did not agree to this), and transcribed verbatim. Thematic analysis.*	**Beliefs - people's rights** Smokers' right to smoke **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree results in changed patient aggression/management issues" **Planning & resource**	**Limitations identified by author(s):** None identified by author(s) **Evidence gaps and/or recommendations for future research:**

mental health trust in England. **Study design** Interview study **Quality score** ++	*concerned included a spectrum of low to high-secure premises across three areas of local, forensic and corporate services. Local services incorporated community and acute-based services for adults, children and adolescents, people with learning disabilities and older people.* **How were the data collected: What method(s):** Interviews **When:** Working hours/Work break **By Whom:** Author/Researcher	**Source population demographics** None reported **How were they recruited:** *Prior to each interview an information sheet was sent to participants, outlining the role and purpose of the research and a consent form.* **How many participants were recruited:** Total sample *19.* *Interviews included four patient advocates and 15 members of staff including nursing (n=10), consultants (n=2), and others (n=3). The respondents were from across the directorates categorised into corporate services (n=1), adult mental health (n=5), forensics (n=6), learning disabilities (n=2), children and adolescents (n=1), and older people (n=4). Eight were male and 11 female.* **Were there specific inclusion/exclusion criteria:** Inclusion criteria not applicable Exclusion criteria not applicable % participation	Smokefree building(s) Smokefree grounds **Supporting strategies:** Written policy(ies) Cessation support Pharmacotherapies/NRT Staff training Other (write in) *Information materials*		**issues** Staff workload/resourcing Staff training Smoking cessation services Structural issues Other planning & resource issues **Other factors** Safety issues Other	None reported **Source of funding:** Government

		agreement not reported				
Authors *Ratschen, Britton & McNeill* **Year** 2008 *Smoke-free hospitals – the English experience: results from a survey, interviews, and site visits* 2009 *[A further paper, focussed on the study's mental health data]Implementation of smoke-free policies in mental health in-patient settings in England* **Aim of study** *To determine the extent of smoke-free policy implementation in English NHS acute and mental health Trusts, and to explore challenges and impacts related to policy implementation* **Study design** Cross-sectional study Interview study	**What was/were the research questions:** Not reported **What theoretical approach does the study take:** Not stated **Setting** *English NHS Trusts providing acute and/or mental health services in inpatient facilities* **How were the data collected: What method(s):** Depth interviews (one-to-one) *~30 min, semi-structured* **When:** Not stated **By Whom:** Not stated	**Country** England **Secondary Care Setting** Both **What population were the sample recruited from:** Staff *Trust Human Resources Directors, Trust Chief Executives* **Source population demographics** Occupation *Trust Human Resources Directors, Trust Chief Executives* **How were they recruited:** *83 survey respondents had indicated their availability for a telephone interview. A 30% sample (25 Trusts) was taken, stratified according to trust type, of which 22 agreed to participate and were interviewed after obtaining informed consent.* **How many participants were recruited:** Total sample *n=22 (n=15 acute Trust staff n=7 mental health setting staff)* **Were there specific**	**Smokefree: Implementation stage:** Smokefree in place *98% respondents reported smokefree policies were implemented, pre-national legislation (1 Jul '07) [from the survey results]* Smokefree impending *2% respondents reported date set for smokefree policies to be in place before 1 Jul '07 [from the survey results]* **Fieldwork stage:** After implementation – single time-point *For 98% respondents* **Where:** Both **Coverage:** Smokefree building(s) *16% smokefree buildings (Acute Trusts); 29% smokefree buildings (Mental Health settings) [from the survey results]* Ban exclusions (write in) *Mental Health Settings (78%); Acute Trusts (50%) (for bereaved/distressed relatives (45%), sheltered outdoor areas (25%), smoking rooms (6%)); for psychiatric patients in 15% Acute Trusts, 65% in mental health settings*	**Brief description of method and process of analysis:** *Responses allocated to predefined/emerging categories in the interview guide.*	**Key themes/findings relevant to this review: Attitudes to smokefree** Staff **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree results in changed patient aggression/management issues" Other views on smokefree effects **Planning & resource issues** Staff workload/resourcing Smoking cessation services **Communication issues** Availability of information Other communication issues **Other factors** Safety issues Other	**Limitations identified by author(s):** *There may be a small degree of reporting bias to the study (study participants largely responsible for implementation); 21% study population did not respond thus limiting the generalizability of results; self-selection bias may affect interview data.* **Evidence gaps:** *A set of defined smoke-free indicators would be useful to assess policy implementation in future, including objective measures of exposure to tobacco smoke* **Source of funding:** Other

Participant observation **Quality score** +		**inclusion/exclusion criteria:** Inclusion criteria *Human Resources Directors of the Trusts were identified as potential study participants. Where no Human Resources Director or alternative main personnel contact could be identified, Chief Executives were chosen instead.* Exclusion criteria not reported % participation agreement *88% (88% acute Trusts, 100% mental health settings)*	*[from the survey results]* Other (write in) *84% smokefree buildings and grounds, including 41% without exemptions (Acute Trusts); 64% smokefree whole premises, including 13% without exemptions (Mental Health settings); 7% smokefree parts of buildings (Mental Health settings) [from the survey results]* **Supporting strategies:** Posters/signage Staff meetings *Almost 75% Trusts informed staff by disseminating information in meetings or special events [from results section]* Staff letters/payslip notes *Emails, newsletters or Trust intranet* Cessation support *Onsite cessation support for patients, 73% Trusts; cessation classes offered for staff, 95% Trusts [from results section]* Pharmacotherapies/NRT *For patients from the hospital pharmacy, 77% Trusts; For staff, free or reduced NRT, 55% Trusts [from results section]* Other			

			Admissions assessments, 45% Trusts; implementation budget, 24% acute Trusts and 19% mental health settings; [from results section]			
Authors *Ratschen et al* **Year** 2009 **Aim of study** *To explore the practical implications of, and the problems arising from, the implementation of a comprehensive smoke-free policy in acute adult inpatient mental health wards.* **Study design** Cross-sectional study Interview study **Quality score** ++	**What was/were the research questions:** Question(s) *A semi-structured interview guide was drafted to explore the following themes:* *1. Attitude towards the smoke-free policy* *2. Arrangements to enforce the policy and support offered to patients* *3. Perceived impacts of the smoke-free policy* *4. Perceptions of patients' smoking* *5. Options for more structured support for patients addressing smoking.* **What theoretical approach does the study take:** *The interview guide was drafted on the basis of the social–cognitive theory, which is a psychosocial model of human behaviour.* **Setting** Setting details (write in) *Two mixed-gender 21-bed*	**Country** England **Secondary Care Setting** Mental Health **What population were the sample recruited from:** Staff *20 nurses; 16 healthcare assistants; 4 consultants; 4 senior house officers; 2 occupational therapists; 2 occupational therapy assistants; 2 ward managers.* **Source population demographics** Occupation *20 nurses; 16 healthcare assistants; 4 consultants; 4 senior house officers; 2 occupational therapists; 2 occupational therapy assistants; 2 ward managers.* **How were they recruited:** Recruitment method *Participants were chosen by sampling within strata defined on purpose to capture the full range of staff groups*	**Smokefree: Implementation stage:** Smokefree in place *Implemented in March 2006* **Fieldwork stage:** After implementation – single time-point **Where:** Mental Health **Coverage:** Smokefree building(s) Smokefree grounds Other *Exceptions to the policy were permitted on a documented case-by-case basis for patients, if criteria defined to address the local circumstances of the respective ward were met.* **Supporting strategies:** Not reported	**Brief description of method and process of analysis:** *Interview data were analysed in a framework approach incorporating the above themes and using Nvivo 7 software. The interviewer familiarized herself with raw data by listening to interview tapes and iterative reading of transcripts to identify all subthemes and emerging issues, and then indexed the data accordingly. All transcripts were also independently read, and themes were identified by another researcher. The indexed data were allocated to the themes of the framework, and the contents of each theme were distilled and summarized.*	**Key themes/findings relevant to this review: Attitudes to smokefree** Staff **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree affects patients' mental health" "Smokefree results in changed patient aggression/management issues" "Smokefree results in changed medication issues" Other views on smokefree effects **Planning & resource issues** Staff workload/resourcing Staff training Smoking cessation services Pharmacotherapies **Communication issues** Patients' familiarity/understanding of policy Health professional's-Patient's relationship	**Limitations identified by author(s):** *'Given that our results refer to two wards of one mental health trust in England, their generalizability may be limited; however, the themes identified were raised by respondents sampled across all professional groups and are likely to be broadly representative of settings similar to the study environment.'* **Evidence gaps and/or recommendations for future research:** Future research recommendations *Previous studies have shown that exposure to ETS in mental health settings decreased*

	acute adult mental health wards in a local mental health trust. **How were the data collected: What method(s):** Depth interviews (one-to-one) *30-45 minutes* **When:** *February-April 2008.* **By Whom:** Author/Researcher	*involved in patient care.* **How many participants were recruited:** Total sample *n=16* *6 male, 10 female.* *Two nurses and two health-care assistants per ward; one consultant and one senior house officer from each ward;* *one occupational therapist and one occupational* *therapy (OT) assistant working across both wards* *were chosen at random. In addition, the ward manager and one health-care assistant employed in one ward to facilitate patient escorts were sampled purposively.* **Were there specific inclusion/exclusion criteria:** Inclusion criteria not applicable Exclusion criteria not applicable % participation agreement *One person declined to take part and was substituted by a participant chosen from the same stratum at random.*			**Other factors** Safety issues	*with the implementation of a smoke-free policy. It is ironic that, in this study, several believed that ETS had increased following implementation of the smoke-free policy, although no objective data were collected to validate this view. Previous evidence also indicates no lasting increase in violence and aggression after the implementation of smoke-free policies in inpatient settings; however, many respondents in our study reported frequent verbal abuse and aggression related to smoking 1 year after policy implementation. It seems plausible that some of the agitation cited resulted from a lack of support in coping with nicotine withdrawal. The difficulty of distinguishing between symptoms*

						of nicotine withdrawal from illness-related symptoms has been described previously, and the perception in our study that withdrawal symptoms were sometimes treated as symptoms of mental illness calls for further exploration. Further research into these issues, especially qualitative research with inpatients, will be vital in understanding how smoke-free policies can be implemented optimally. **Source of funding:** Not reported
Authors *Ratschen et al* **Year** 2010 **Aim of study** *To explore patients' experience, smoking behaviour and symptoms of nicotine withdrawal in the*	**What was/were the research questions:** Not reported **What theoretical approach does the study take:** Not stated **Setting** *Two acute adult mental health wards housing 16 female and 16 male inpatients respectively,*	**Country** England **Secondary Care Setting** Mental Health **What population were the sample recruited from:** Patients **Source population demographics** Smoking status	**Smokefree: Implementation stage:** Smokefree in place *March 2007* **Fieldwork stage:** After implementation – single time-point *May-June 2008* **Where:** Mental Health **Coverage:**	**Brief description of method and process of analysis:** *Structured data from the interviews were collated in Microsoft Excel data files. Notes of the exploratory interview part were transcribed into verbatim text (wherever possible, depending on the patient's organization of speech) and analysed in*	**Key themes/findings relevant to this review: Attitudes to smokefree** Patients **Beliefs - people's rights** Smokers' right to smoke **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree affects patients' mental health" **Planning & resource**	**Limitations identified by author(s):** *The study was conducted on three wards located at one site, and in a small sample using qualitative methods. The generalizability of results is therefore limited, and*

context of a comprehensive smokefree policy on mental health acute wards, and to identify options for the future to promote and support smoking cessation and/or reduction in these settings. **Study design** Cross-sectional study Interview study **Quality score** ++	*and one 10-bed intensive care unit, all of which were located at the same site.* **How were the data collected: What method(s):** Depth interviews (one-to-one) **When:** *May-June 2008* **By Whom:** Author/Researcher	*smokers* **How were they recruited:** *Participants were chosen on the basis of a criterion sampling technique by approaching every inpatient who fulfilled the inclusion criteria. Recruitment was continued until it was felt that no novel issues related to the main subject of patients' experience with the smoke-free policy and patients' smoking behaviour on the trust premises were emerging – i.e. the point of data saturation in view of the focus of the study had been reached. Ward staff were consulted on the eligibility of patients and introduced the researcher to potential participants.* **How many participants were recruited:** Total sample *n=15* *9 male, 6 female* *Mean age 42.3 years (range 27-61)* *Mean time on ward (days) 151 days (range 2-990)* *Mean years of smoking 30.2 (range 10-52)* *Diagnosis: Schizophrenia, schizotypal and delusional disorders n=5; Mood and*	Smokefree building(s) Smokefree grounds Ban exclusions *Formally, patients were not allowed to smoke anywhere on the premises; however, since the premises bordered a busy main road and were opposite a school, smoking in front of the entrance to the wards on trust grounds was condoned for non-detained smokers. Those detained on the two acute wards were escorted off the premises by staff to smoke. Patients on the intensive care unit were allowed to smoke in the open courtyard ad libitum.* **Supporting strategies:** Pharmacotherapies/NRT	*a framework approach using NVivo 7 software. The transcripts were read repeatedly by the main researcher and another researcher, and data were allocated to predefined categories of the interview guide and newly emerging themes. The coded data were then ascribed to the higher-order categories 'health behaviour', 'individual factors (cognitive and affective)', and 'environmental factors' of social cognitive theory, and the analysis undertaken with a special focus on environmental and cognitive and affective individual factors facilitating or impeding health behavioural change.*	**issues** Pharmacotherapies **Communication issues** Patients' familiarity/understanding of policy **Other factors** Safety issues	*particularly results referring to the measurement of structured data need to be regarded as preliminary, with no statistical tests carried out due to very small sample sizes.* **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Other

		affective disorders n=7; Neurotic, stress-related and somatoform disorders n=1; Organic disorder n=1. **Were there specific inclusion/exclusion criteria:** Inclusion criteria *Smoker. Capable of giving informed consent and participate in the study without this posing risks to the patient's condition or the researcher.* Exclusion criteria not applicable % participation agreement *54% On the two acute adult mental health wards, five of the 11 female smokers and seven of the 13 male smokers who were approached agreed to participate in the study, and no exclusions due to the severity of the mental health condition were made on either ward. Three of the four patients deemed eligible under clinical and security considerations on the intensive care units (one female and two male) were recruited.*				
Authors *Schultz et al.*	**What was/were the research questions:** *Patients: respondents' use*	**Country** Canada	**Smokefree: Implementation stage:** Smokefree in place	**Brief description of method and process of analysis:**	**Key themes/findings relevant to this review: Attitudes to smokefree**	**Limitations identified by author(s):**

Year 2011 **Aim of study** *To determine the consequences of policies mandating smoke-free hospital property in two Canadian acute-care hospitals by eliciting lived experiences of the people faced with enacting the policies.* **Study design** Cross-sectional study Focus group study *Registered Nurses and Other Healthcare Providers* Interview study *Patients, Policy-makers, Support staff* **Quality score** ++	*of tobacco and treatment for tobacco dependence while in hospital, and their impressions of the policy. Healthcare professionals: their perceptions of the policy and the management of tobacco use among patients. Policy-makers & support staff: the development and implementation of the policy, and ongoing concerns.* **What theoretical approach does the study take:** Ethnography **Setting** *2 Canadian tertiary acute-care hospitals in provinces with similar weather conditions* **How were the data collected: What method(s):** Focus groups *Audio-recorded, 60-90mins* Depth interviews (one-to-one) *Audio-recorded, 10-30mins (patients) 30-90mins (policymakers, support staff)* Observation *6hrs/site* **When:** *Dec 08 - May 09 (6m)*	*Alberta, Manitoba* **Secondary Care Setting** Not Mental Health (Acute and/or Maternity) **What population were the sample recruited from:** Patients Staff *Healthcare professionals, policy-makers, hospital support staff (housekeepers, security guards, groundskeepers)* **Source population demographics** Health status *Patients: inpatients with acute/chronic health conditions* Smoking status *Smokers & non-smokers* Age *Adult* **How were they recruited:** Recruitment method *Patients & healthcare providers: convenience and stratified quota strategies (advertising posters and pamphlets) Policy-makers and hospital support staff: purposive and stratified quota strategies (invitation)* **How many participants were recruited:**	*"At each site, three years before our study began, a policy for smoke-free property had been implemented under the direction of local health authorities and in response to city bylaws mandating smoke-free public places."* **Fieldwork stage:** After implementation – single time-point **Where:** Not Mental Health **Coverage:** Smokefree building(s) Smokefree doorways/entrances Ban exclusions (write in) *"Wards providing palliative, hospice or psychiatric care or care for chemical-dependence were exempt from the smoke-free policies. At one hospital, patients of the emergency department were allowed to smoke outside under supervision."* Other (write in) *Parking lots* *Spaces adjacent to air uptake vents* **Supporting strategies:** Written policy(ies) *Copies of smokefree*	*Data from verbatim transcriptions, documents from study wards and field observation notes analysed using a nonlinear process to generate themes inductively. Themes were reviewed throughout the process with 85% agreement on blind coding of a sample of 1/3 using the final scheme. Data from the demographic questionnaires underwent descriptive statistical analysis.*	Staff Patients **Beliefs - people's rights** Smokers' right to smoke **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree results in changed patient aggression/management issues" **Planning & resource issues** Staff workload/resourcing Staff training Smoking cessation services Pharmacotherapies Other planning & resource issues **Communication issues** Patients' familiarity/understanding of policy Other communication issues **Other factors** Safety issues	*Unable to assess how the smoke-free policies and their impact on patients have evolved over time.* **Evidence gaps and/or recommendations for future research:** Future research recommendations *Studies in other settings are" warranted to capture the diverse array of wards, populations and settings beyond those represented in this study".* **Source of funding:** Government Voluntary/Charity

	By Whom: Author/Researcher	Total sample *Total n=186 (Patients n=82, Registered Nurses n=54, Other Healthcare Providers n=27, Policy-makers n=9, Support staff n=14)* *Sample characteristics: Patients (60% male, 54.7 years, 28% current smoker, 53% former smoker, 20% non smoker); Registered Nurses (19% male, 39.2 years, 15% current smoker, 15% former smoker, 70% non smoker); Other Healthcare Providers (19% male, 34.8 years, 19% current smoker, 22% former smoker, 56% non smoker); Policy-makers (22% male, 50.6 years, 11% current smoker, 56% former smoker, 33% non smoker); Support staff (64% male, 50.0 years, 7% current smoker, 36% former smoker, 57% non smoker)* **Were there specific inclusion/exclusion criteria:** Inclusion criteria *Patients: ability to speak and understand English and provide informed consent* *Healthcare professionals: all health professionals*	*property policy available in ward binders* Posters/signage Cessation support Pharmacotherapies/NRT Removal ashtrays/shelters *"lack of ashtrays" (p.1337)* Other *Repeated noncompliance was to be reported to the hospital administration (1 site)* *Community resources: 2 wards displayed information about local smoker's help line; 1 ward displayed poster for a local tobacco-cessation program*			

		working on the ward *Policy-makers & hospital support staff: not reported* Exclusion criteria not reported % participation agreement *Policy-makers & hospital support staff: all who were invited agreed to be interviewed except 2 policy-makers due to unavailability* *Patients and healthcare providers: not reported*				
Authors *Seymour* **Year** 2000 **Aim of study** *To provide real life examples of effective smokefree policies that could be shared and learnt from.* **Study design** Case study Interview study **Quality score** -	**What was/were the research questions:** *1. when was the policy written?* *2. how regularly is the policy reviewed/updated?* *3. date of last review/update* *4. Please describe the steps you took for establishing the tobacco policy requirements for your organisation, including: 1) getting evidence 2) consultation 3) communication about change 4) Implementation 5) monitoring performance* *5. Please outline how you consulted and communicated with employees before and during implementation of*	**Country** England **Secondary Care Setting** Both **How were they recruited:** *A questionnaire was sent to every health authority and trust in England.*	**Smokefree: Implementation stage:** Smokefree in place **Fieldwork stage:** After implementation – single time-point **Where:** Both **Coverage:** Smokefree building(s) Smokefree grounds *Not all Trusts/Authorities had a ban that included grounds.*	**Brief description of method and process of analysis:** *Not reported*	**Key themes/findings relevant to this review: Attitudes to smokefree** Staff **Planning & resource issues** Smoking cessation services Other planning & resource issues **Communication issues** Other communication issues **Other factors** Other	**Limitations identified by author(s):** None identified by author(s) **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Government

	the policy *6. How are current employees kept updated and new employees informed of the tobacco policy?* *7. How have you addressed the needs of staff who smoke?* *8. Do you offer smoking cessation services? If yes, please describe below* *9. Do you have any provision for patient/visitor smoking? If yes, please describe below.* *10. Please describe below how you monitor your process for policy monitoring (including who is responsible for policy monitoring)* *11. How are policy breaches handled?* *12. What plans do you have for developing/extending your policy in the future?* **What theoretical approach does the study take:** Case study(ies) **Setting** *Several English Health Authorities/Trusts: Tameside Acute Care Blackburn, Hydburn and Ribble Valley Health Care NHS Trust (focus on staff*					

	smoking ban) *Hull and East Yorkshire NHS Trust (focus on a NRT initiative)* *West Suffolk Hospitals Trust* *Sandwell Healthcare NHS Trust (focus on smoking cessation services)* *Ashworth Hospital Authority* **How were the data collected: What method(s):** Interviews *Follow up interviews with representative from each short-listed Trust.* Questionnaires: open-ended questions **When:** Not stated **By Whom:** Not stated					
Authors *Sheffer, Stitzer & Wheeler* **Year** 2009 **Aim of study** *The aim of the study was to characterize the perceived concerns and sources of support and resistance reported by the Chief*	**What was/were the research questions:** Not reported **What theoretical approach does the study take:** Not stated **Setting** *Arkansas medical facilities. The number of beds at the medical facilities ranged from 0 to 791, with a mean of 132, a median of 77, and a*	**Country** USA **Secondary Care Setting** Both **What population were the sample recruited from:** *Chief Executive Officers (CEOs) and administrators of Arkansas medical facilities.* **Source population demographics** Occupation	**Smokefree: Implementation stage:** Smokefree in place *From October 2005* **Fieldwork stage:** Before implementation – single time-point *April/May 2005* After implementation – single time-point *October 2006* **Where:** Both	**Brief description of method and process of analysis:** *Open-ended responses were categorized and summarized by similar words, meanings, and/or themes.*	**Key themes/findings relevant to this review: Attitudes to smokefree** Staff **Planning & resource issues** Staff workload/resourcing Planning/Timing-specific issues	**Limitations identified by author(s):** *Subjective views not objectively validated by observational or corroborative data. Possibility of participation bias. Results may not be generalisable to other settings.* **Evidence gaps**

Executive Officers (CEOs) and administrators of Arkansas medical facilities before and after smokefree legislation became effective. **Study design** Before-and-after study (with same sample after intervention) Interview study **Quality score** +	*mode of 25. The majority of facilities had no psychiatric or alcohol and drug beds (n=68; 64.76%), with 27.62% (n=29) maintaining some psychiatric and alcohol and drug beds, and 7.62% (n=8) maintaining only psychiatric and/or alcohol and drug beds. The majority of medical facilities were private non-profit (56.36%), with 26.36% under corporate control, and 17.27% under city, county, state, or federal government control.* **How were the data collected: What method(s):** Interviews **When:** Not stated **By Whom:** Not stated	*Chief Executive Officers (CEOs) and administrators of Arkansas medical facilities.* **How were they recruited:** Recruitment method *A list of member medical facilities and CEO/administrators was obtained from the Arkansas Hospital Association. Three additional facilities were subsequently identified through contact with hospital CEOs.* **How many participants were recruited:** Total sample *113 hospital CEOs/administrators.* **Were there specific inclusion/exclusion criteria:** Inclusion criteria not applicable Exclusion criteria not applicable % participation agreement *Pre-implementation survey: 87.61%* *Post-implementation survey: 69.02%*	**Coverage:** Smokefree building(s) Smokefree grounds **Supporting strategies:** Other (write in) *Smoke-Free Hospital Toolkit comprised of a booklet to guide implementation and a resource CD. Numerous written resources were provided on the CD including administrative and clinical guidelines, examples of policy statements, signage, training activities, and problem-solving.*			**and/or recommendations for future research:** None reported **Source of funding:** Not reported
Authors *Tillgren et al* **Year** 1998	**What was/were the research questions:** Not reported **What theoretical**	**Country** Sweden **Secondary Care Setting** Not reported	**Smokefree: Implementation stage:** Smokefree in place *1 July 1993*	**Brief description of method and process of analysis:** *Not reported.*	**Key themes/findings relevant to this review: Attitudes to smokefree** Staff	**Limitations identified by author(s):** None identified by

Aim of study *To study how a policy decision about implementing a smokefree hospital was adhered to 4 years after its introduction.* **Study design** Interview study **Quality score** -	**approach does the study take:** Not stated **Setting** *A large University hospital that focuses on healthcare, training and research. The hospital provides qualified emergency and specialist care for Stockholm. In1995, the total number of consultations was 54,000. The number of outpatients visits was 550,000 and the staff numbered 5,900 full time employees.* **How were the data collected: What method(s):** Interviews **When:** Not stated **By Whom:** Not stated	**What population were the sample recruited from:** Staff *Professional groups who worked both inside the hospital and outdoors in the hospital park. Not healthcare staff. Gardeners, cleaners, hostesses/hosts* **Source population demographics** Occupation *Gardeners, cleaners, hostesses/hosts* **How were they recruited:** Not reported **How many participants were recruited:** Total sample *n=15* *Gardeners n=5 All middle aged men who had been in the same job for at least 5 years.* *Cleaners n=5 All middle aged women who had worked at the hospital for a minimum of 2 years.* *Hosts/hostesses n=5 4 women/1 man. 65-70 years. Had worked as volunteers for the Swedish Red Cross for at least 10 years.* **Were there specific inclusion/exclusion criteria:**	**Fieldwork stage:** After implementation – single time-point **Where:** Not reported **Coverage:** Smokefree building(s) **Supporting strategies:** Posters/signage		**Planning & resource issues** Smoking cessation services **Other factors** Other	author(s) **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Not reported

		Inclusion criteria *Gardeners, cleaners, hostesses/hosts* Exclusion criteria not reported % participation agreement not reported				
Authors *Wareing & Gray* **Year** Unpublished **Aim of study** *To investigate the application of smokefree legislation to mental health settings after two years of implementation.* **Study design** Non-participant observation **Quality score** +	**What was/were the research questions:** *The primary areas of observational investigation were:* *a) Compliance with the smokefree legislation and* *b) What has happened to smoking?* **What theoretical approach does the study take:** Not stated **Setting** *A broad range of mental health facilities across England, both independent and NHS.* **How were the data collected: What method(s):** Observation *The investigators started each visit with a recording sheet covering selected areas which had been identified as the key issues to be observed/discussed. A scoring system was developed in order to be able to compare and*	**Country** England **Secondary Care Setting** Mental Health **What population were the sample recruited from:** Not applicable **How were they recruited:** *The selection of sites for visiting was determined against the following criteria:* *Type of facility – to represent the range* *Geographically by region NHS/Independent* *Critique of the questionnaires i.e. indication of* *o exceptional practice* *o likely non-compliance* *o non return.* **How many participants were recruited:** Total sample *28 mental health units* **Were there specific inclusion/exclusion criteria:** Inclusion criteria not	**Smokefree: Implementation stage:** Smokefree in place *Implemented July 2008.* **Fieldwork stage:** After implementation – single time-point **Where:** Mental Health **Coverage:** Smokefree building(s) **Supporting strategies:** Not reported	**Brief description of method and process of analysis:** *The investigators started each visit with a recording sheet covering selected areas which had been identified as the key issues to be observed/discussed. A scoring system was developed in order to be able to compare and contrast.* *Scores were allocated independently by each investigator over ten areas, with a maximum of five points in each, which affected both the compliance with the legislation and management of smoking in each of the units. The maximum score that could be achieved was 50.*	**Planning & resource issues** Smoking cessation services Other planning & resource issues **Other factors** Other	**Limitations identified by author(s):** None identified by author(s) **Evidence gaps and/or recommendations for future research:** None reported **Source of funding:** Government

	contrast. *Scores were allocated independently by each investigator over ten areas, with a maximum of five points in each, which affected both the compliance with the legislation and management of smoking in each of the units. The maximum score that could be achieved was 50.* **When:** Not stated **By Whom:** Author/Researcher	applicable Exclusion criteria not applicable				
Authors *Wheeler et al.* **Year** 2007 **Aim of study** *To measure the impact of the new smoke-free campus policies on employees and patients at the two institutions on the hospital campus.* **Study design** Focus group study Interview study *Key informant interviews* **Quality score** -	**What was/were the research questions:** Not reported **What theoretical approach does the study take:** Not stated **Setting** *Two sites: 1) Arkansas's university hospital and academic medical center and 2) a smaller, private children's hospital that uses the university's faculty and residents for its medical staff* **How were the data collected: What method(s):** Focus groups Interviews	**Country** USA **Secondary Care Setting** Not Mental Health (Acute and/or Maternity) **What population were the sample recruited from:** Staff **Source population demographics** Occupation *Administrators, supervisors, security force staff* **How were they recruited:** *Eight hospital administrators were identified by the evaluation workgroup as being knowledgeable*	**Smokefree: Implementation stage:** Smokefree in place *Site 1: announced 29th Oct 03, implemented 4th Jul 04; Site 2: announced Spring 04, implemented 6 months later (employees) and Spring 05 (12 months later) (employees, visitors, patients)* **Fieldwork stage:** Before implementation – single time-point *Site 1: Apr 04 (questionnaire), Jul 03-Jun 04 monthly mean (hospital utilisation), Jan 04 (employee resignations, terminations, hires); Site 2: 2 months after*	**Brief description of method and process of analysis:** *Not reported*	**Key themes/findings relevant to this review: Attitudes to smokefree** Staff **Beliefs - effects of smokefree on patients, staff & visitors** "Smokefree results in changed patient aggression/management issues" "Smokefree affects patient recruitment & retention" "Smokefree affects staff" **Planning & resource issues** Other planning & resource issues **Other factors**	**Limitations identified by author(s):** *Study restricted to two hospital campuses and not all outcomes were measured on both campuses. Efforts to enroll other regional hospitals were limited by the hesitancy of institutions to commit to smoke-free and concerns about sharing proprietary information about employment statistics.*

	Key informant interviews **When:** Not stated **By Whom:** Not stated	*about the effects of the policy on employees and consumers and were individually interviewed after the UAMS smoking ban was implemented. Seven supervisors identified by the human resources office and four members of the security force identified by the Chief of Police participated in two separate focus groups.* **How many participants were recruited:** Total sample *n=19* *Eight hospital administrators were identified by the evaluation workgroup as being knowledgeable about the effects of the policy on employees and consumers and were individually interviewed after the UAMS smoking ban was implemented. Seven supervisors identified by the human resources office and four members of the security force identified by the Chief of Police participated in two separate focus groups.* **Were there specific inclusion/exclusion criteria:**	*employee only ban (= 4 months pre-full smokefree) (questionnaire), May 04-Oct 04 monthly mean (hospital utilisation)* After implementation – single time-point *Site 1: May 05 (questionnaire), Aug 04-Jul 05 monthly mean (hospital utilisation), Jan 05 (employee resignations, terminations, hires); Site 2: May 05-Oct 05 monthly mean (hospital utilisation)* **Where:** Not Mental Health **Coverage:** Smokefree building(s) Smokefree vehicles Smokefree grounds Other (write in) *All property owned or leased.* **Supporting strategies:** Written policy(ies) Implementation committee Posters/signage Staff meetings Staff letters/payslip notes Patient appointment letters Cessation support Pharmacotherapies/NRT		Safety issues Other	**Evidence gaps:** *"Reasons that hospitals have not volunteered to go smoke-free have not been carefully studied"* **Source of funding:** Government Voluntary/Charity

		Inclusion criteria not reported Exclusion criteria not reported % participation agreement not reported	*Site 1: free to employees for 6m (Apr-Sep 04), on sale on campus to non-employees. Site 2: free to employees (open-ended), n sale on campus to non-employees.* Other *Staff appointed (site 1: wellness director, site 2: tobacco control specialist with cessation expertise); Site 1: portable pagers in emergency dept. for patrons/visitors who needed to leave campus to smoke; Scripts for staff to deal with patrons smoking; Staff violations dealt with by HR dept.; Written policy in new employees packs; Neighbouring businesses notified; Announcements in local media.*			

APPENDIX 8: Evidence Tables for Review 7 Included Quantitative Studies

Study details	Population and setting	Method of allocation to intervention or control	Outcomes and methods of analysis	Results	Notes
Authors *Arack et al* **Year** 2009 **Aim of study** *To explore the effects of a complete smoking ban at an NHS trust, focusing on the attitudes, compliance and smoking behaviour of NHS staff on the smoke-free NHS policy.* **Study design** Cross-sectional study **Quality score** - **External validity score** -	**Country** England **Urban/rural setting** Not reported **Secondary Care setting** Both *NHS Acute trust* **Source population** Staff *Trust workforce = 11,000 people.* **Source population demographics** Occupation *NHS Acute Trust staff* **Recruitment** *'Opportunity sample'. Participants recruited through hospital wards and departments who demonstrated an interest in taking part.* **Population selection criteria** Inclusion criteria not reported Exclusion criteria not reported % participation agreement *45% response rate.* **Potential sources of bias (association)** Not reported **Setting** *Isle of Wight NHS Acute Trust.*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *From January 2006.* **When assessed** After implementation – single time-point *May 2007.* **Where** Both *NHS Acute Trust* **Smokefree coverage** Not reported **Supporting strategies/interventions** Not reported **Sample size** Total sample *n=160* *89% female.* *91% Caucasian, 4.5% Asian-Indian, 1.3% Asian-other, 1.3% black African, 0.6% other.* *48.4% never smokers, 27% ex-smokers, 19.5% smokers, 5%*	**Primary outcomes** Attitudinal outcomes *Support for smoking ban on hospital grounds.* *Opinions about hospital smoking ban implementation.* **Follow-up periods** Not applicable **Method of analysis** Not reported	**Attitudes to smokefree: Staff** *78.3% of respondents supported the smoking ban on hospital grounds.* *63.3% of respondents felt that the hospital had not strictly enforced the ban.* **Attrition** Not applicable	**Limitations identified by author(s)** *Possibility of participation bias.* *Limited sample size.* *No objective measures of health behaviour.* **Future research recommendations** *Further research on the effects of the smoking ban: objective measures of health and focus groups to collect information on attitudes, compliance and health behaviour of NHS staff.* *Studies targeting different ethnic groups.* *Development of a standardised attitude scale on smoking behaviour to help support and evaluate workplace smokefree policies.* **Source of funding** Not reported

		occasional smokers. Occupational groups: 38% nursing, 30.9% admin/clerical, 17.8% allied health professions, 2.0% science and professional, 5.3% technical, 3.9% medical, 1.3% auxiliary. **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not reported			
Authors *Baile et al* **Year** 1991 **Aim of study** *To investigate the impact of a complete smoking ban on the employees of a cancer treatment centre.* **Study design** Cross-sectional study **Quality score** + **External validity score** -	**Country** USA **Urban/rural setting** Not reported **Secondary Care setting** Not Mental Health (Acute and/or Maternity) **Source population** Staff *~500* **Source population demographics** Smoking status *smokers and non-smokers approx. 24% smokers.* **Recruitment** *Questionnaires were distributed to employees during regularly scheduled departmental staff meetings.*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place. **When assessed** After implementation – single time-point **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/interventions** Cessation support **Sample size** Total sample *266 non-smokers. 79% female*	**Primary outcomes** Attitudinal outcomes *Beliefs about employer's right to ban smoking from work and non-work environments.* **Follow-up periods** Not applicable **Method of analysis** Not reported	**Beliefs - people's rights: Other rights issues** *Non-smokers overwhelmingly agreed that employers have a right to ban smoking on the worksite (93%) and that employers do not have a right to ban smoking off the worksite (89%).* **Attrition** Not applicable	**Limitations identified by author(s)** None identified by author(s) **Evidence gaps/future research recommendations** None reported **Source of funding** Not reported

	Population selection criteria Inclusion criteria *All non-smoker employees.* Exclusion criteria not applicable % participation not reported **Potential sources of bias (association)** Not reported **Setting** *Cancer treatment centre.*	*Average age 32.3 years (SD = 8.6)* *52% married* *23% graduate degrees* *22% high school degrees* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable			
Authors *Bloor, Meeson & Crome* **Year** 2006 **Aim of study** *To audit the effectiveness of a non-smoking policy in a mental health hospital in Stoke on Trent, a city in the UK Midlands; and to investigate the impact of the policy on nursing staff smoking behaviour and attitudes.* **Study design** Cross-sectional study **Quality score** + **External validity score** +	**Country** England **Urban/rural setting** Urban *a city (Stoke on Trent) in the Midlands, UK* **Secondary Care setting** Mental Health **Source population** Staff **Source population demographics** Occupation *Nursing grade A–D 30.3% (n=50), Nursing grade E 31.5% (n=52), Nursing grade F 12.7% (n=21), Nursing grade G 20.0% (n=33), Nursing grade H 3.0% (n=5), Nursing grade I 0.6% (n=1), Senior Manager 1.8% (n=3)* Age *<21 years n=0, 21-30 years 12.7% (n=21), 31-40 years 38.2% (n=63), 41-50 years 35.8% (n=59), >50 years 13.3% (n=22)*	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Unit implemented a total-site no smoking policy upon opening in 2001.* **When assessed** After implementation – single time-point **Where** Mental Health **Smokefree coverage** Not reported **Supporting strategies/interventions** Written policy(ies) *With 8 objectives (see*	**Primary outcomes** Attitudinal outcomes *Level of agreement/disagreement with: "A restrictive smoking policy in hospitals is a good idea"; "I support the smoking policy of the Health Trust"; "Health Trusts have to fulfil an exemplary role in the field of worksite non-smoking policies"; "Staff should have the right to smoke if they wish"; "It is unfair to allow patients, but not staff, to smoke on site"; "I feel the non-smoking policy is unfair to staff"; "I feel the non-smoking policy is unfair to patients"; "A non-smoking policy violates the personal freedom of smokers"; "I feel that smokers are victimised by the non-*	**Attitudes to smokefree: Staff** *Overall, 57.7% nursing staff respondents (40.61% smokers, 62.6% former smokers and 71.4% never smokers) agreed with the statement "A restrictive smoking policy in hospitals is a good idea". Overall, 44.6% nursing staff respondents (15.61% smokers, 53.1% former smokers and 53.6% never smokers) agreed with the statement "I support the smoking policy of the Health Trust". Overall, 41.3% nursing staff respondents (59.1% smokers, 43.7% former smokers and 46.5% never smokers) agreed with the statement "Health Trusts have to fulfil an exemplary role in the field of worksite non-smoking policies". No further statistical information is available.* **Beliefs - people's rights: Smokers' right to smoke** *Overall, 82.53% nursing staff respondents (96.9% smokers, 68.7% former smokers and 82.1% never smokers) agreed with the statement "Staff should have the right to smoke if they wish". Overall, 78.2% nursing staff respondents (93.8% smokers, 75.1% former smokers and 64.3% never smokers) agreed with the statement "It is unfair to allow patients, but not staff, to*	**Limitations identified by author(s)** *The self-reported questionnaires open to respondent bias. No smoking behaviour demographics available for non-respondents to compare how representative the selected sample was.* **Limitations identified by review team** *Limited reporting of analysis and any confounders makes internal validity unclear; no control group. Source population's demographics provided - excluding smoking behaviour.* **Evidence gaps/future research recommendations** None reported

	Sex *Male 27.9% (n=46), Female 72.1% (n=119)* Ethnicity *White 97.6% (n=161), Mixed race n=0, Asian/British Asian 0.6% (n=1), Black/Black British 1.8% (n=3), Chinese/other n=0* **Recruitment** *Questionnaires were distributed by internal post, addressed to a specific member of the nursing staff. Names were supplied by the personnel department.* **Population selection criteria** Inclusion criteria *All nursing staff* Exclusion criteria not reported % participation agreement *58%* **Potential sources of bias (association)** *No smoking behaviour demographics for non-responders. Authors report ethnic profile matched that for the city and study setting; comparatively fewer nursing Grade F and above responded but age, gender, marital status, ethnicity and other grades representative.* **Setting** *A modern, purpose-built psychiatric unit in Stoke on Trent, UK*	*Table 1)* **Sample size** Total sample *n=92* *Sample characteristics: Nursing grade A–D 44.6% (n=41), Nursing grade E 25.0% (n=23), Nursing grade F 7.6% (n=7), Nursing grade G 7.6% (n=7), Nursing grade H 1.1% (n=1), Nursing grade I n=0, Senior Manager n=0, Did not specify 14.1% (n=13); Smokers 34.78%, Former Smokers 34.78%, Never smokers 30.43%; <21 years n=0, 21-30 years 22.8% (n=21), 31-40 years 29.3% (n=27), 41-50 years 31.5% (n=29), >50 years 16.3% (n=15); Male 33.7% (n=31), Female 65.2% (n=60), Did not specify 1.1% (n=1); White 97.8% (n=90), Mixed race n=0, Asian/British n=0, Black/Black British 2.2% (n=2), Chinese/other n=0.* **Baseline comparison** Not applicable **Study sufficiently powered? (association)**	*smoking policy"; "A workplace smoking restriction increases the stress levels of nurses who smoke"; "The non-smoking policy protects non-smokers from passive smoking at work"; "A non-smoking policy encourages staff to quit smoking"; "A workplace non-smoking policy motivates smokers to quit smoking"; "The non-smoking policy is easy to enforce".* **Follow-up periods** Not applicable **Method of analysis** *Attitude statements elicited responses on a 5-point scale, from 'strongly agree' to 'strongly disagree', which were allocated a score from 1 to 5, with 1 being positive in all cases.*	*smoke on site". Overall, 69.6% nursing staff respondents (84.4% smokers, 68.8% former smokers and 53.5% never smokers) agreed with the statement "I feel the non-smoking policy is unfair to staff". Overall, 53.3% nursing staff respondents (50.0% smokers, 46.9% former smokers and 35.7% never smokers) agreed with the statement "I feel the non-smoking policy is unfair to patients". Overall, 68.5% nursing staff respondents (93.7% smokers, 62.5% former smokers and 46.5% never smokers) agreed with the statement "A non-smoking policy violates the personal freedom of smokers". Overall, 66.3% nursing staff respondents (93.7% smokers, 59.4% former smokers and 42.9% never smokers) agreed with the statement "I feel that smokers are victimised by the non-smoking policy". No further statistical information is available.* **Beliefs - effects of smokefree: "Smokefree affects staff"** *Overall, 66.3% nursing staff respondents (75.0% smokers, 71.9% former smokers and 50.0% never smokers) agreed with the statement "A workplace smoking restriction increases the stress levels of nurses who smoke". Overall, 56.5% nursing staff respondents (46.9% smokers, 65.7% former smokers and 64.3% never smokers) agreed with the statement "The non-smoking policy protects non-smokers from passive smoking at work". Overall, 32.5% nursing staff respondents (15.67% smokers, 37.5% former smokers and 50.0% never smokers) agreed with the statement "A non-smoking policy encourages staff to quit smoking". Overall, 28.2% nursing staff respondents (9.4% smokers, 28.1% former smokers and*	**Source of funding** Not reported

		Not reported *No info given on power or statistical analysis*		*50.0% never smokers) agreed with the statement "A workplace non-smoking policy motivates smokers to quit smoking". No further statistical information is available.* **Planning & resource issues: Staff workload/resourcing** *Overall, 30.0% nursing staff respondents (21.8 smokers, 34.4% former smokers and 35.7% never smokers) agreed with the statement "The non-smoking policy is easy to enforce". No further statistical information is available.* **Attrition** Not applicable	
Authors *Cormac et al.* **Year** 2010 **Aim of study** *To evaluate the impact of a total smoking ban in buildings and grounds in a high secure psychiatric hospital.* **Study design** Before-and-after study (with different sample after intervention) *No control group. Pre- and post-ban responses not linked but most sample the same (n=298 patients for study*	**Country** England **Urban/rural setting** Not reported **Secondary Care setting** Mental Health **Source population** Patients Staff **Source population demographics** Smoking status *72.8% patients resident in the hospital for the full evaluation period were smokers before the ban.* **Recruitment** Recruitment method *Postal survey sent to all staff and all patients (resident at the time)* **Population selection criteria**	**Method of allocation** Not applicable Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place **When assessed** Before implementation – single time-point *Feb 07* After implementation – single time-point *Jul 07* **Where** Mental Health **Smokefree coverage** Smokefree building(s) Smokefree grounds **Supporting**	**Primary outcomes** Attitudinal outcomes *In favour of the ban (staff & patients); mental health would be/had been adversely affected by the ban (patients); physical health would be/had been adversely affected by the ban (patients); patients would be/are more aggressive if they could/can not smoke (staff); more likely to/had self-harm(ed) if they could not smoke (staff); patients would need/had needed more medication because they could not smoke (staff).* **Follow-up periods** Follow-up period(s) *8 months*	**Attitudes to smokefree: Staff** *In favour of the ban: staff pre-ban 528/1038 (50.9%) staff post-ban 404/670 (60.3%). Changed in favour of smokefree. No further statistical information is available.* **Attitudes to smokefree: Patients** *In favour of the ban: patients pre-ban 40/175 (22.9%) patients post-ban 29/115 (25.2%). Changed in favour of smokefree. No further statistical information is available.* **Beliefs - effects of smokefree: "Smokefree affects patients' mental health"** *Belief mental health adversely affected: patients pre-ban 93/175 (53.1%) patients post-ban 45/115 (39.1%). Changed in favour of smokefree. No further statistical information is available.* **Beliefs - effects of smokefree: "Smokefree affects patients' physical health"** *Belief physical health adversely affected:*	**Limitations identified by author(s)** *As the questionnaires were anonymous it was not possible to link the pre-ban responses to the post-ban responses for either patients or staff.* **Future research recommendations** *A long-term evaluation of the health benefits of smoke-free environments to patients in long-stay NHS facilities.* **Source of funding** Not reported

duration) **Quality score** + **External validity score** +	Inclusion criteria *All patients resident in the hospital and all staff.* Exclusion criteria not applicable % participation agreement *Patients 51% (pre-ban) 35% (post-ban); Staff 55.7% (pre-ban) 34% (post-ban)* **Potential sources of bias (association)** + *Selection bias possible for the staff/patient survey - most motivated to complete the survey.* **Setting** *A high secure, long-stay psychiatric hospital for patients with complex mental health disorders who are a grave and immediate danger to the public or themselves (the majority have committed serious offences).*	**strategies/interventions** Cessation support Pharmacotherapies/ NRT Staff training Other (write in) *Information provision (without further detail) Surrender of smoking materials (in-patients) On the weekend of policy introduction, all wards were fully staffed and additional activities were provided as a distraction.* **Sample size** Total sample *Patients n=175 (pre-ban) n=115 (post-ban); Staff n=1038 (pre-ban) n=670 (post-ban)* *Sample characteristics: Patients pre-ban (89% male, 70% smokers pre-ban). Patients post-ban (85% male, 87% smokers pre-ban); Staff pre-ban (46% male, 23% smokers pre-ban, 61% nursing staff). Staff post-ban (38% male, 22% smokers pre-ban, 54% nursing staff).* **Baseline comparison**	**Method of analysis** Method(s) of analysis (write in) *Not reported*	*patients pre-ban 47/175 (26.9%) patients post-ban 29/115 (25.2%). Changed in favour of smokefree. No further statistical information is available.* **Beliefs - effects of smokefree: "Smokefree results in changed patient aggression/management issues"** *Belief patients more aggressive: all staff pre-ban 573/1038 (55.2%) all staff post-ban 100/670 (14.9%); nursing staff pre-ban 409/538 (76%) nursing staff post-ban 69/286 (24.1%). Changed in favour of smokefree. No further statistical information is available.* **Beliefs - effects of smokefree: "Smokefree results in changed medication issues"** *Belief patients need more medication: all staff pre-ban 477/1038 (46%) all staff post-ban 85/670 (12.7%); nursing staff pre-ban 362/538 (67.3%) nursing staff post-ban 66/286 of nurses (23.1%). Changed in favour of smokefree. No further statistical information is available.* **Beliefs - effects of smokefree: Other views on smokefree effects** *Belief patients more likely to self-harm: all staff pre-ban 491/1038 (47.3%) all staff post-ban 55/670 of all staff (8.2%); nursing staff pre-ban 359/538 (66.7%) nursing staff post-ban 36/286 (12.6%). Changed in favour of smokefree. No further statistical information is available.* **Attrition** Not applicable	

		Not reported *Gender, smoking status and (for staff only) whether nurse or not were reported at both time-points as %, but no comparisons made by authors.* **Study sufficiently powered? (association)** Not reported			
Authors *Daughton et al.* **Year** 1992 **Aim of study** *To examine the early and long-term influence of a total indoor smoking ban on institutional smoking cessation rates, as well as on smoker behaviour and comfort in a hospital setting.* **Study design** *Cross-sectional study (2 time-points after implementation)* **Quality score** - **External validity score** -	**Country** USA *Nebraska* **Urban/rural setting** Not reported **Secondary Care setting** Not Mental Health (Acute and/or Maternity) **Source population** Staff *Hospital employees* **Source population demographics** None reported **Recruitment** *Survey 1: Hospital departments circulated a 1-page questionnaire generally accompanied by a letter of support from a department representative. Isolated employees who indicated they had not received a department questionnaire were provided with one. Survey 2: the first survey, although anonymous, had space for*	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *No implementation date reported* **When assessed** After implementation – multiple time-points *Post-ban Survey 1 (1 year after policy announced, 5 months after implementation); Post-ban Survey 2 (2 years after policy announced, 17 months after implementation)* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s)	**Primary outcomes** Attitudinal outcomes *Survey 1: Support for the smoking ban; Difficulty complying with the ban* *Survey 2: Long-term support for the smoking ban* **Follow-up periods** Follow-up period(s) *1 year* **Method of analysis** *Fisher's exact test was used to analyse categorical data and Student's t test for continuous data. Comparison values are expressed as means ± standard error of the mean.*	**Attitudes to smokefree: Staff** *Support for the smoking ban: Five months after implementation of a total indoor ban on smoking, and one year after it was announced, 89% non-smokers staff (n=523), 86% ex-smokers (those who quit before the ban was announced) (n=245), 81% of ban-year quitters (n=13) and 45% smokers (n=82) supported the ban. Significant sub-group differences: Five months after implementation of a total indoor ban on smoking, only 27% of heavy smokers staff (≥30 cigs/day) (n=6) compared with 64% of light smokers (<10 cigs/day) (n=34) favoured the policy (p<0.05). Five months after implementation of a total indoor ban on smoking, 74% staff smokers who wanted to stop smoking "a lot" (n=26) compared with only 15% smokers who did not wish to quit (n=8), supported the ban (p<0.001).* *Long-term support for the smoking ban: Seventeen months after implementation of a total indoor ban on smoking at the hospital, and 2 years after the policy was announced, 82% staff smokers who*	**Limitations identified by author(s)** *Results may have been influenced by limitations of study design e.g. anonymous initial survey hindered long-term follow-up assessment; incomplete/ unreturned questionnaires may have introduced a selection bias; smoking level subgroups may have been over- or under-represented.* **Limitations identified by review team** *Demographic data not collected; no control group. Source population not described; potential selection/respondent bias* **Evidence gaps/future research recommendations** None reported **Source of funding**

	contact details if willing to be re-contacted. **Population selection criteria** Inclusion criteria *Survey 1 – all employees (those working in departments and isolated employees); Survey 2 – smokers who participated in Survey 1 who had provided contact details.* Exclusion criteria *Survey 1: Pipe and cigar smokers (n=7), individuals in process of quitting (<5 months abstinence). Survey 2: those no longer employed by hospital (n=11)* % participation agreement *"approximately one-third" Survey 1; 47% Survey 2* **Potential sources of bias (association)** - *Self-selection response to survey; low participation ("approx. a third"); follow-up relies on first survey respondents providing contact details (preventing anonymity); no demographics for non-responders.* **Setting** *"In a hospital setting"*	*A "total indoor smoking ban"* **Supporting strategies/interventions** Implementation committee *32-member Smoke-Free Campus Task Force* Staff letters/payslip notes *Employee bulletins and newsletters* Cessation support *Hospital-promoted cessation programs, and offer to subsidise costs of locally available cessation programs.* Other (write in) *In-house media campaign* **Sample size** Total sample *Survey 1: n=1070* *Sample characteristics: n=589 non-smokers, n=284 ex-smokers (self-report abstinent for >5 months prior to ban announcement), n=16 ban-year quitters (self-report abstinent for ≥3 months), n=181 smokers (n=55 light smokers <10 cigs/day, n=110 moderate*		*completed both surveys (n=72) maintained their original support for the ban. 16% changed their (n=14) changed from position of non-support 5 months post-implementation to support for the policy one year later.* **Planning & resource issues: Compliance/Enforcement issues** *Difficulty complying with the ban: Five months after implementation of a total indoor ban on smoking, 30% staff smokers (n=52) indicated that they found it difficult to observe the hospital's smoke-free policy. Sub group differences: Five months after implementation of a total indoor ban on smoking, more heavy smokers staff (≥30 cigs/day) (55%) than moderate (10-29 cigs/day) (33%) or light smokers (<10 cigs/day) (13%) reported they found it difficult to comply with the ban (p=0.0008).* *Seventeen months after implementation of a total indoor ban on smoking at the hospital, and 2 years after the policy was announced, 49% staff smokers reported that the smoking ban was easier to observe during the second policy year.* **Attrition** Not applicable	Not reported

		smokers 10-29 cigs/day, n=22 heavy smokers ≥30 cigs/day). Occupations (of those who identified themselves) included: physicians, nurses, cafeteria workers, painters, mail room clerks, laboratory technicians, administrators, secretaries, researchers and environmental service workers. *Survey 2: n=88* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not reported			
Authors *Donchin & Baras* **Year** 2004 **Aim of study** *A process and outcome evaluation of implementation of a complete smoking ban at a hospital in Israel.* **Study design** Before-and-after study (with different sample after	**Country** Israel **Urban/rural setting** Urban *City* **Secondary Care setting** Not Mental Health (Acute and/or Maternity) **Source population** Staff *Hospital's general employee population on payroll July 2000 (n=3670)* **Source population demographics**	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented 1 Nov '00* **When assessed** Before implementation – single time-point *3 months pre-policy*	**Primary outcomes** Attitudinal outcomes *Attitude toward current hospital smoking regulations (Should be more restrictions, There is too much restriction, Are appropriate, Unfamiliar with the regulations); Attitudes towards smoking in the workplace (% agreement with the statement "The hospital should be completely 'smoke-free'")*	**Attitudes to smokefree: Staff** *Attitude toward current hospital smoking regulations: pre-policy implementation, 54.2% of respondents agreed that there should be more smoking restrictions dropping to 24.3% agreeing there should be more restrictions post-policy. 60.5% of all respondents agreed that the post-policy regulations were appropriate (an increase from 34.9% pre-policy). This change in opinion, corresponding to a change in policy, was statistically significant (p<0.0001). Staff reporting that they were unaware of any smoking policy dropped from 7.6% to 2.8% post-implementation.*	**Limitations identified by author(s)** None identified **Limitations identified by review team** *No control group for temporal confounders.* **Evidence gaps** *Collecting specific data as to whom the covert smokers might be (hospital staff, or patients and visitors to the hospital) and how common the practice really is would be helpful*

intervention) **Quality score** + **External validity score** +	Occupation *Doctors and dentists 18.0%, nurses 30.3%, administrators and clerks 16.9%, technicians 22.8%, unskilled workers 12.0%* Age *<35 years 24.5%, 35– 44 years 27.8%, 45– 54 years 29.4%, 55+ years 18.3%* Sex *Males 36.5%* **Recruitment** *Simple random sampling method was used: pre-policy survey based on a sample of 11% of 3,670 hospital workers; the post-policy survey drew a 12% sample of 3,705 workers employed at that time to allow for the exclusion of workers who already participated in the first survey. Surveys conducted by hospital's occupational health unit and school of public health. Interviewers sought out every worker entering each sample survey, presenting them with the questionnaire that was completed immediately and returned directly to interviewers. Confidentiality was promised though the questionnaires were not anonymous.* **Population selection criteria** Inclusion criteria *All salaried employees on the payroll in July 2000 (pre-policy sample) and April 2001 (post-policy sample) were eligible*	After implementation – single time-point *6-9 months post-policy* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/interventions** Implementation committee Cessation support *Employees* Other (write in) *Smoking shelters ("booths") erected outside the hospital building; sale of tobacco products banned on site; Information campaign (2 months pre-policy) and press conference launch; Fines for violations authorised* **Sample size** Total sample *n=368 staff (pre-policy), n=364 (post-policy)* *Sample characteristics (pre- and post-policy): Doctors and dentists 17.1% (pre-) 13.5% (post-), nurses 27.4% 31.9%, administrators and clerks 14.9%*	**Follow-up periods** Follow-up period(s) *9-12 months* **Method of analysis** *36 employees participated in both surveys. Their data were included in the pre-policy survey findings only. Univariate comparisons between pre- and post-policy responses between the two surveys or between 'smoker' and 'non-smoker' responses within each survey were made using Fisher's Exact test for dichotomies and chi-square tests for categorical variables with more than two categories. Wherever a table contained a cell with an expected frequency <5, the P value reported is exact and not asymptotic. Logistic regression was the main tool used for multivariate analysis.*	*Attitude toward current hospital smoking regulations, sub-group differences: Non-smokers made up the bulk of the policy supporters in both the pre- and post-policy surveys (p<0.0001). Male non-smokers were more likely to support stricter regulations than female non-smokers: 41.2% vs. 22.7%, respectively (p<0.005).* *Attitudes towards smoking in the workplace (% agreement with the statement "The hospital should be completely 'smoke-free'"): There were differing response rates from smokers and non-smokers in both the pre- (45.7% and 84.5%, respectively) and post-policy surveys (60.0% and 87.0%, respectively) (p<0.0001) with smokers being less likely to agree with the statement, "The hospital should be completely 'smoke-free'". The increase in smokers who agreed with this statement from pre- to post-policy was not statistically significant.* *In the pre-policy survey, controlling for personal smoking status, unskilled workers and clerks were most likely to agree with the statement, "The hospital should be completely 'smoke-free'", while doctors, nurses, and technicians were least likely to (no data reported).* **Communication issues: Staffs' familiarity/understanding of policy** *Staff reporting that they were unaware of any smoking policy dropped from 7.6% to 2.8% post-implementation.* **Attrition** Not applicable	*to tailor-make further interventions aimed at eliminating smoking in the hospital.* **Source of funding** Not reported

	Exclusion criteria not reported % participation agreement *90.4% (pre-policy), 92.8% (post-policy)* **Potential sources of bias (association)** ++ *Authors state pre- and post-samples are representative of eligible population; comparable demographics in Table 1 (no statistical analysis).* **Setting** *A 959-bed university hospital in Jerusalem, employing over 3,700 salaried workers and accommodating 42,580 inpatients and 201,185 outpatient visits (2001).*	*17.0%,technicians 28.0% 26.6%, unskilled workers 12.5% 11.0%; <35 years 23.1% (pre-) 22.5% (post-), 35– 44 years 26.9% 28.3%, 45– 54 years 29.3% 27.7%, 55+ years 20.7% 21.4%; Males 36.1% (pre-) 30.2% (post-); 0-12 years of education 23.2% (pre-) 25.4% (post-), 13-15 years of education 23.5% 18.5%, 16+ years of education 53.3% 56.1%. Smoking status: current smokers 19% (pre-) 19.5% (post-), past smokers 12.5% 19.5%.* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not reported			
Authors *Erwin & Biordi* **Year** 1991 **Aim of study** *This study presents the reactions of nursing staff members on two VA inpatient psychiatric wards who experienced the*	**Country** USA *Illinois* **Urban/rural setting** Urban **Secondary Care setting** Mental Health **Source population** Staff *Nursing staff* **Source population**	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented 1 Mar '90 (announced 2 months earlier)*	**Primary outcomes** Attitudinal outcomes *Nursing staff support for a smokefree ward* **Follow-up periods** Follow-up period(s) *<3 months (date of baseline survey not stated)* **Method of analysis** Not reported	**Attitudes to smokefree: Staff** *Nursing staff support for a smokefree ward: Pre-implementation, 44% Ward A nursing staff and 61% Ward B nursing staff reported to prefer a smoke-free ward. One week after smokefree implementation support for a smokefree ward was 60% Ward A and 60% Ward B, and 63% Ward A and 60% Ward B 4 weeks after smokefree implementation. (No p values calculated)* **Attrition**	**Limitations identified by author(s)** None identified by author(s) **Limitations identified by review team** *No description of analysis or significance values. Data analysis unreported.* **Evidence gaps** *Few articles document the*

transition to smoke-free status. **Study design** Before-and-after study (with same sample after intervention) **Quality score** - **External validity score** +	**demographics** Occupation *Ward A: 12 registered nurses, 2 licensed practical nurses, 2 nurses aides* *Ward B: 7 registered nurses, 3 licensed practical nurses, 3 nurses aides* **Recruitment** *Memos and reminders sent by head nurses to nursing staff to collect questionnaire from a confidential site.* **Population selection criteria** Inclusion criteria *All nursing staff members on the two acute psychiatric wards* Exclusion criteria not reported % participation agreement *100% (Pre-ban ward A), 100% (Pre-ban ward B), 63% (1 week post-ban ward A), 50% (1 week post-ban ward B), 100% (4 weeks post-ban ward A), 77% (4 weeks post-ban ward B)* **Potential sources of bias (association)** + *100% before; 50-63% 1wk after; 77-100% 4wk after; self-selection, small convenience sample* **Setting** *A VA (US Dept. of Veterans Affairs) hospital in an urban centre in Illinois. Two 21-bed acute care psychiatric wards for veterans with diagnose including schizophrenia, depression and*	**When assessed** Before implementation – single time-point *No date* After implementation – multiple time-points *1 week following implementation and 4 weeks following implementation* **Where** Mental Health **Smokefree coverage** *Smokefree acute psychiatric wards (presume from the paper's introduction, the rest of hospital is smokefree)* **Supporting strategies/interventions** Cessation support *Nursing interventions included "Encouraged patients to participate in smoking cessation groups"* Other *Interventions by nursing staff that address patients with the urge to smoke on the psychiatric ward (e.g. encouraging activities that foster energy replenishment/use;*		Not applicable	*effects of establishing smokefree psychiatric units (1991)* **Source of funding** Not reported

	post-traumatic stress disorder	*promoting physical benefits of not smoking and preventing harm; individualising care (p.r.n. medications, time outs); involving significant others in care).* **Sample size** Total sample *n=29* *Sample characteristics: 66% (n=19) registered nurses, 17% (n=5) licensed practical nurses, 17% (n=5) nurses aides* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not reported			
Authors *Etter, Khan & Etter* **Year** 2008 **Aim of study** *To compare the acceptability and efficacy of a partial smoking ban and total ban in an in-patient psychiatric hospital.* **Study design** Before-and-after	**Country** Switzerland **Urban/rural setting** Not reported **Secondary Care setting** Mental Health **Source population** Patients Staff Specific Ward(s)/Department(s) **Source population demographics** Health status	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *Implemented in Jan 06* **When assessed** Before implementation – multiple time-points *Oct 03 (pre ban), Apr 04 (2 months post-partial ban), Dec 05 (20 months post-*	**Primary outcomes** Attitudinal outcomes *Knowledge of smokefree policy; Opinion of rules about smoking (staff and patients)* **Follow-up periods** Follow-up period(s) *29-31 months* **Method of analysis** *Chi-square tests and odds ratios to compare proportions, and independent-sample t*	**Attitudes to smokefree: Staff** *Opinion of rules about smoking: Between 2003 (no ban) and 2006 (total ban), there was a significant increase in the percentage of staff reporting that "Rules about smoking at the hospital are too strict" (7.0% to 59.6%, p<0.001), there was a decrease in the percentage of staff reporting that "Rules about smoking at the hospital are adequate" (71.9% to 36.8%, p value not given).* **Attitudes to smokefree: Patients** *Opinion of rules about smoking: Between 2003 (no ban) and 2006 (total ban), there was a significant increase in the*	**Limitations identified by author(s)** *Self-reports are subject to social desirability bias. Independent sample t-tests are too conservative and may underestimate the statistical significance (as many of the same staff took part in several surveys). The 2006 survey was conducted 3 months after implementation and may not reflect long-term acceptability and impact.*

study (with different sample after intervention) *(The staff sample consisted of largely the same people who answered successive surveys, although results not linked)* **Quality score** + **External validity score** +	*Patients had mainly psychotic disorders, depression and personality disorders.* Age *Adults* **Recruitment** *A physician, nurse or psychologist distributed self-report questionnaires to patients and staff after explaining the study and obtaining written informed consent. Patients answered the survey as soon as their condition allowed (about 1 week after admission for most). The distributing staffcompleted the questionnaires with patients who were unable to answer by themselves.* **Population selection criteria** Inclusion criteria *All patients and staff present at the time of data collection* Exclusion criteria not reported % participation agreement *Patients: 86.0% (2003 no ban), 67.5% (2006 total ban); Staff: 100% (2003 no ban), 91.9% (2006 total ban)* **Potential sources of bias (association)** + *staff 92-100% participation ('03, '06), patients 86-68%. No data on non-responders. Small sample size.* **Setting** *Two in-patient, adult units of the Psychiatry Department of the*	*partial ban/pre-total ban)* After implementation – single time-point *Mar-May 06 (3-5 months post-total ban)* **Where** Mental Health **Smokefree coverage** Smokefree building(s) *Patients (except those in locked rooms) and staff were allowed to leave the unit to smoke outside* **Supporting strategies/interventions** Posters/signage Cessation support Pharmacotherapies/NRT *NRT free for patients, not for staff.* Closure of smoking rooms Staff training **Sample size** Total sample *2003 (no ban) n=106 (n=49 patients, n=57 staff), 2006 (total ban) n=134 (n=77 patients, n=57 staff)* *Sample characteristics: Patients 2003 (no ban) 91.8% Ever smoked 100+ cigarettes, Daily*	*tests to compare means.*	*percentage of patients reporting that "Rules about smoking at the hospital are too strict" (12.2% to 49.4%, p<0.001), there was a decrease in the percentage of patients reporting that "Rules about smoking at the hospital are adequate" (73.5% to 46.8%, p value not given).* **Communication issues: Staffs' familiarity/understanding of policy** *Knowledge of policy: In 2006 (total ban), 93% staff correctly answered that "smoking was prohibited everywhere in the clinic".* **Communication issues: Patients' familiarity/understanding of policy** *Knowledge of policy: In 2006 (total ban), 90% patients correctly answered that "smoking was prohibited everywhere in the clinic".* **Attrition** Not applicable	*The sample size was relatively small, which increases the risk of type II error. Without a control group, naturally occurring time trends could not be distinguished.* **Limitations identified by review team** *Follow-up measures taken 3-5 months post-total ban, subject selection was consistent with no significant differences between group demographics. Small sample size.* **Evidence gaps** *"The acceptability and impact of total smoking bans in psychiatry hospitals is incompletely documented, in particular in Europe."* **Source of funding** Other

	Geneva University Hospitals: an admission and short-stay unit (16 beds, mean duration of stays=17 days, median=7 days) and a medium-stay unit (16 beds, mean duration of stays=37 days, median=15 days). Patients had mainly psychotic disorders, depression and personality disorders.	*smokers 73.5%, Occasional (non-daily) smokers 6.1%, Former smokers 12.2%, Never smokers 8.2%, 2006 (total ban) 81.6% Ever smoked 100+ cigarettes, Daily smokers 65.8%, Occasional (non-daily) smokers 2.6%, Former smokers 15.8%, Never smokers 15.8%; Staff 2003 (no ban) 64.9% Ever smoked 100+ cigarettes, Daily smokers 26.3%, Occasional (non-daily) smokers 7.0%, Former smokers 22.8%, Never smokers 43.9%, 2006 (total ban) 57.9% Ever smoked 100+ cigarettes, Daily smokers 26.3%, Occasional (non-daily) smokers 7.0%, Former smokers 22.8%, Never smokers 43.9%. Patients 2003 (no ban) mean age 39.9 years, 2006 (total ban) mean age 41.0 years; Staff 2003 (no ban) mean age 38.8 years, 2006 (total ban) mean age 40.7 years. Patients 2003 (no ban) 59.2% men, 2006 (total ban) 60.0% men; Staff 2003 (no ban) 35.1% men,*			

		2006 (total ban) 37.5% men. **Baseline comparison** Not applicable **Study sufficiently powered? (association)** - *Authors note that the sample size was relatively small, which increases the risk of type II error.*			
Authors *Fitzpatrick et al* **Year** 2009 **Aim of study** *To collect data on staff and patient attitudes to a planned campus-wide smoking ban t an acute general hospital.* **Study design** Cross-sectional study **Quality score** + **External validity score** +	**Country** Ireland **Urban/rural setting** Not reported **Secondary Care setting** Both **Source population** Patients *In-patients (520 hospital beds)* Staff *2928 staff on payroll* **Source population demographics** None reported **Recruitment** Recruitment method *Not reported* **Population selection criteria** Inclusion criteria not reported Exclusion criteria not reported % participation agreement *In-patients 81%* *Staff 100%*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *Indoor ban implemented in 2004* Smokefree impending *Campus wide ban to be implemented in 2009* **When assessed** Before implementation – single time-point *2006: Before implementation of campus-wide ban (after implementation of indoor ban)* *Staff: December 2006* *Patients: July 2006* **Where** Not reported	**Primary outcomes** Attitudinal outcomes *Attitudes towards campus total smoking ban.* **Follow-up periods** Not applicable **Method of analysis** Not reported	**Attitudes to smokefree: Staff** *Would you agree with the introduction of a total campus-wide smoking ban indoor and outdoor?* *Yes: 52.4%* *No: 38.2%* *Don't know: 9.3%* *If it was introduced, would you support its implementation?* *Yes: 74.7%* *No: 14.2%* *Don't know: 11.1%* *Results breakdown by age, gender and occupation.* **Attitudes to smokefree: Patients** *Do you think the hospital should go completely smokefree, including the grounds?* *Yes: 51.9%* *No: 40.9%* *Don't know: 7.3%* *Results breakdown by gender, age and GMS entitlement.*	**Limitations identified by author(s)** None identified by author(s) **Evidence gaps/future research recommendations** None reported **Source of funding** Government

	Potential sources of bias (association) + **Setting** *Acute general hospital with between 350 and 520 in-patient beds.*	**Smokefree coverage** Smokefree building(s) Smokefree grounds *Due to be implemented in 2009* **Supporting strategies/interventions** Not reported **Sample size** Total sample *Patients: 295* *Staff: 225* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable		**Attrition** Not applicable	
Authors *Garg et al.* **Year** 2009 **Aim of study** *To explore staff attitudes to a smoking ban in a psychiatric unit and to ascertain if they had experienced any difficulties in imposing the ban four months after its introduction.* **Study design** Cross-sectional study	**Country** England **Urban/rural setting** Not reported **Secondary Care setting** Mental Health **Source population** Staff **Source population demographics** None reported **Recruitment** *Staff on duty available between 09:00 and 17:00hrs during a 3 week period in Nov '07 were approached. Those who agreed to participate were interviewed*	**Method of allocation** Investigator did not assign exposure **Smokefree implementation stage** Smokefree in place *Implemented 1 Jul '07* **When assessed** After implementation – single time-point **Where** Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/interventions**	**Primary outcomes** Attitudinal outcomes *Support for the smoking ban; Whether staff feel the ban has been successfully implemented; Whether the ban had any positive effects (encouraged patients or staff to think about giving up smoking, smoking rooms were being used for other clinical activities, working atmosphere was cleaner, most patients were sleeping at night)* **Follow-up periods**	**Attitudes to smokefree: Staff** *Support for the smoking ban: 75% psychiatrists (9/12) and 62.5% nursing staff (qualified and unqualified) (65/104) answered yes, they support the smoking ban. There was no significant difference between the views of psychiatrists and nursing staff (p=0.53).* *Smokers were significantly less likely to support the ban than non-smokers (p = 0.0001).* **Beliefs - effects of smokefree: "Smokefree affects staff"** *Whether the ban had any positive effects: 65% (n=76) of staff reported positive effects due to the smoking ban. 91.7% psychiatrists (11/12) and 62.5% nursing staff (qualified and unqualified) (65/104) answered 'yes' to 'Has the smoking ban*	**Limitations identified by author(s)** None identified by author(s) **Limitations identified by review team** *Reliability and validation of outcome measures limited; social desirability/interviewer bias may be a factor; no control group.* *No demographics for non-responders but self-report smoking rates of respondents (30%) slightly higher than UK general population.*

Quality score + **External validity score** +	*using a semi-structured questionnaire.* **Population selection criteria** Inclusion criteria *All members of nursing and medical staff on duty during the study period* Exclusion criteria not reported % participation agreement *65%* **Potential sources of bias (association)** + *65% participation; daytime staff only; no demographics for non-responders* **Setting** *A 90 bed regional medium secure psychiatric unit in West Yorkshire.*	Closure of smoking rooms Other (write in) *Smoking shelters and courtyard areas for smoking pre- and post-ban* **Sample size** Total sample *n=116 (60% qualified nurses (n=70), 29% unqualified nursing staff (n=34), 10% doctors/psychiatrists (n=12))* *Sample characteristics: 39% men (n=45), mean age 37 (SD 9.62) years, 30% (self-reported) current smokers (n=35). Current smokers: psychiatrists 16.7%, qualified nurses 34.3%, unqualified nurses 26.5%. There were no statistical differences of smoking rates [sic] between the doctors and the nurses (p=0.34) or between qualified and unqualified nursing staff (p=0.5).* **Baseline comparison** Not applicable **Study sufficiently powered? (association)**	Not applicable **Method of analysis** *SPSS v.11 software used, but tests not reported. p values given for occupation, smoking status proportions and comparisons for nurses' vs. doctors' views.*	*had any positive effects?' There was no significant difference between the views of psychiatrists and nursing staff (p=0.06). Of those who reported positive effects, 21% (n=16) felt that it had encouraged staff to think about giving up smoking.* **Beliefs - effects of smokefree: Other views on smokefree effects** *Whether the ban had any positive effects: 65% (n=76) of staff reported positive effects due to the smoking ban. 91.7% psychiatrists (11/12) and 62.5% nursing staff (qualified and unqualified) (65/104) answered 'yes' to 'Has the smoking ban had any positive effects?' There was no significant difference between the views of psychiatrists and nursing staff (p=0.06). Of those who reported positive effects, 51% (n=39) felt that it had encouraged patients to think about giving up smoking.* **Planning & resource issues: Structural issues** *Whether the ban had any positive effects: 65% (n=76) of staff reported positive effects due to the smoking ban. 91.7% psychiatrists (11/12) and 62.5% nursing staff (qualified and unqualified) (65/104) answered 'yes' to 'Has the smoking ban had any positive effects?' There was no significant difference between the views of psychiatrists and nursing staff (p=0.06). Of those who reported positive effects, 18% (n=14) said that smoking rooms were being used for other clinical activities, 23% felt that the working atmosphere was cleaner and 60% (n=46) felt that most patients were sleeping at night as designated smoking areas were closed at night ("It was striking to note that closing the designated smoking area at night helped many patients sleep. Anecdotal*	**Future research recommendations** *A repeat of the survey when complete smokefree is in place (including outdoors).* **Source of funding** Government

		Not reported		*evidence suggested that prior to the ban many patients were sleeping during the day and staying up at night smoking" p.379).* **Other factors: Success of implementation** *Success of implementation: Of all staff, 41% (n=48) felt that the ban was successfully implemented. 66.7% psychiatrists (8/12) and 69% nursing staff (qualified and unqualified) (60/104) answered 'no' to 'Do you feel the ban has been successfully implemented?' There was no significant difference between the views of psychiatrists and nursing staff (p=0.76).* **Attrition** Not applicable	
Authors *Haller, McNiel & Binder* **Year** 1996 **Aim of study** *To study the effects of a complete smoking ban on a locked psychiatric unit.* **Study design** Before-and-after study (with different sample after intervention) *Likely that most of the staff sample were the same pre- and post-ban* **Quality score**	**Country** USA *California* **Urban/rural setting** Not reported **Secondary Care setting** Mental Health **Source population** Patients Staff **Source population demographics** Health status *PATIENTS Diagnosis: Schizophrenia 19% (pre-ban) 32% (post-ban), Mood disorder 48% (pre-ban) 28% (post-ban), Other (pre-ban) 33% (post-ban) 40%* Speciality care *PATIENTS 83% of the patients*	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Yes (implementation date not reported, early 1990s)* **When assessed** Before implementation – single time-point *1 month pre-ban (staff, patients)* After implementation – single time-point *1 month post-ban*	**Primary outcomes** Attitudinal outcomes *Agreement/disagreement with statements (Likert scale) to measure attitudes towards the desirability of the smoking ban and its perceived impact on aspects of patients' mental status and the ward milieu: smoking should be entirely banned in a hospital setting; ban is unfair and cruel for involuntarily hospitalised patients; non-smoking patients appreciate the ban; patients would be too fragile to cope with smoking withdrawal; patients would become*	**Attitudes to smokefree: Staff** *Pre-ban implementation, 57% staff (38/67) agreed that smoking should be entirely banned in a hospital setting, rising to 70% (37/53) agreement post-ban.* *Sub-group comparisons: After the ban implementation, patients were significantly more likely than staff to disagree that smoking should be entirely banned in a hospital setting (t=-3.45, df=144, p<0.001).* **Attitudes to smokefree: Patients** *Pre-ban implementation, 33% patients (7/21) agreed that smoking should be entirely banned in a hospital setting, changing little post-ban to 35% (33/93) agreement.* *Sub-group comparisons: After the ban implementation, patients were significantly more likely than staff to disagree that smoking should be entirely banned in a hospital setting (t=-3.45, df=144, p<0.001).*	**Limitations identified by author(s)** *The study was completed in an area with a reputation for "health consciousness" (San Francisco), and only half the patients were current smokers. Smoking rates may differ across the country.* **Limitations identified by review team** *Risk of self-selection bias, unvalidated outcome measures, no control group.* **Evidence gaps/future research recommendations** Evidence gaps

+ **External validity score** +	*discharged over the 5 months of the study were civilly committed* Smoking status *PATIENTS Current smoker: Yes 41% (pre-ban) 53% (post-ban), No 59% (pre-ban) 47% (post-ban)* Age *PATIENTS Mean age 44 years (pre-ban) 42 years (post-ban)* Sex *PATIENTS Male 41% (pre-ban) 57% (post-ban)* Ethnicity *PATIENTS White 63% (pre-ban) 71% (post-ban), Non-white 37% (pre-ban) 29% (post-ban)* None reported *Rev 7: for Staff* **Recruitment** *Patients asked at time of discharge to complete an anonymous survey about the perceived impact of a no-smoking policy; staff recruitment method not reported.* **Population selection criteria** Inclusion criteria (write in) *All patients discharged 1 month before and 2-4 months after ban implementation; staff from all disciplines.* Exclusion criteria not reported % participation agreement *Patients 78% (pre-ban) 85% (post-ban), staff 81% (pre-ban) 64% (post-ban)* **Potential sources of bias (association)** ++	*(staff), 2-4 months post-ban (patients)* **Where** Mental Health *Locked inpatient unit* **Smokefree coverage** Smokefree building(s) Smokefree grounds **Supporting strategies/interventions** Pharmacotherapies/NRT *Prescriptions for patients* Other (write in) *Staff education to recognize and treat nicotine withdrawal symptoms/cigarette cravings; written information for patients (use of nicotine gum and how to manage cravings)* **Sample size** Total sample *Rev 6: n=27 (pre-ban), n=26 (1 month post-ban), n=30 (2 months post-ban), n=36 (3 months post-ban), n=43 (4 months post-ban) (n=135 total post-ban)* *Sample characteristics = Source population characteristics. No statistically significant*	*restless; patients would need more medication; patients would leave the unit against medical advice; patients would try to elope; patients would want to be transferred to an unlocked unit; nicotine replacement would successfully control withdrawal symptoms. (Survey designed by authors.)* **Follow-up periods** Follow-up period(s) *3-5 months* **Method of analysis** Method(s) of analysis (write in) *Pre-post comparisons and comparisons between ratings by patients and staff were analysed with t-test (two-tailed).*	**Beliefs - people's rights: Smokers' right to smoke** *Compared with their attitudes pre-ban implementation, post-ban patients felt significantly less strongly that the ban was unfair and cruel (t=2.26, df=111, p<0.03).* *Sub-group comparisons post-ban: After the ban implementation, patients were significantly more likely than staff to agree that the ban was unfair and cruel for involuntarily hospitalised patients (t=2.39, df=144, p<0.02).* **Beliefs - people's rights: Non-smokers' right to smokefree** *Sub-group comparisons post-ban: After the ban implementation, patients were significantly more likely than staff to disagree that non-smoking patients would appreciate the ban (t=-3.27, df=140, p<0.001).* **Beliefs - effects of smokefree: "Smokefree affects patients' mental health"** *Compared with their attitudes pre-ban implementation, post-ban staff were significantly less concerned about patients being too fragile to cope with smoking withdrawal (t=2.50, df=117, p<0.02).* **Beliefs - effects of smokefree: "Smokefree results in changed patient aggression/management issues"** *Compared with their attitudes pre-ban implementation, post-ban staff were significantly less concerned about patients becoming restless (t=2.49, df=117, p<0.02).* **Beliefs - effects of smokefree: "Smokefree results in changed medication issues"**	*Studies of smoking bans in psychiatric facilities which do not permit smoking in specified areas or smoking passes* **Source of funding** Not reported

	patients 78% (pre-ban) 85% (post-ban), staff 81% (pre-ban) 64% (post-ban) participation; chart data for 100% patients **Setting** *A 16-bed locked inpatient unit in San Francisco, CA, with a 2 week mean length of stay.*	*differences in demographic and clinical features between the pre-ban sample and the total post-ban sample.* *STAFF n=67 (pre-ban) n= 53(post-ban) Sample characteristics - Occupation: nurses 36 (pre-ban) 32 (post-ban), physicians 13 (pre-) 6 (post-), other staff 18 (pre-) 15 (post). Current smokers 5 (pre-) 4 (post-).* *PATIENTS n=21 (pre-ban) n=93 (post-ban) Sample characteristics not reported* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not reported		*Compared with their attitudes pre-ban implementation, staff were significantly less concerned post-ban about patients needing more medication (t=-6.96, df=86, p<0.001).* *Compared with their attitudes pre-ban implementation, patients felt significantly less strongly that extra doses of psychiatric medications would be needed (t=-2.73, df=108, p<0.01) and that total medication doses would need to be increased (t=2.39, df=44, p<0.02).* **Beliefs - effects of smokefree: "Smokefree affects patient recruitment & retention"** *Compared with their attitudes pre-ban implementation, post-ban staff were significantly less concerned about patients leaving the unit against medical advice (t=6.51, df=118, p<0.001) and patients trying to elope (t=3.99, df=118, p<0.001).* *Sub-group comparisons post-ban: After the ban implementation, patients were significantly more likely than staff to agree that more patients would want to be transferred to an unlocked unit (t=7.25, df=139, p<0.001).* **Planning & resource issues: Pharmacotherapies** *After the ban implementation, patients were significantly more likely than staff to disagree that nicotine replacement would successfully control withdrawal symptoms (t=-1.98, df=140, p<0.05).* **Attrition** Not applicable	
Authors	**Country**	**Method of allocation**	**Primary outcomes** Attitudinal outcomes	**Beliefs - effects of smokefree: "Smokefree affects patient recruitment**	**Limitations identified by author(s)**

Hill et al **Year** 2007 **Aim of study** *To investigate the attitudes of patients and staff on an in-patient drug and alcohol dependence treatment service towards the proposed policy to ban smoking within substance use in-patient treatment facilities.* **Study design** Cross-sectional study **Quality score** ++ **External validity score** ++	England **Urban/rural setting** Not reported **Secondary Care setting** Mental Health **Source population** Patients Staff **Source population demographics** Speciality care *Patients: individuals in treatment for drug dependence, alcohol dependence, or both disorders.* **Recruitment** *Patients currently in treatment were asked to complete the questionnaires and questionnaires were returned to the research team on a weekly basis. Telephone interviews were conducted with patients awaiting admission.* *Staff questionnaires were distributed by post to all multidisciplinary staff on the addiction in-patient wards.* **Population selection criteria** Inclusion criteria *Patients currently in treatment, patients awaiting admission.* *All staff.* Exclusion criteria not applicable % participation not reported **Potential sources of bias (association)** ++	Not applicable **Smokefree implementation stage** Smokefree impending *July 2008* **When assessed** Before implementation – single time-point *October/November 2005* **Where** Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/interventions** Not reported **Sample size** Total sample *n=77* *38 patients (10 awaiting admission); 39 staff* *More than half of the patients (52%, n=20) were receiving treatment on the in-patient alcohol treatment unit, 24% (n=9) on the in-patient drug treatment unit, and 24% (n=9) on the in-patient acute assessment unit. The mean age of the patient sample was 38*	*Willingness to accept treatment with a no smoking policy; difficulty of treatment for drug and/or alcohol dependence with a no smoking policy; success of treatment with a no-smoking policy.* **Follow-up periods** Not applicable **Method of analysis** *Staff and patient responses to structured questions were entered into SPSS database for analysis.*	**& retention"** *Two-thirds (63%) of staff believed that patients would be unlikely to accept treatment if there was a no smoking policy.* *Patients: Almost three-quarters (73%) of the smokers felt that they would be unlikely to accept treatment if there was a no smoking policy.* **Beliefs - effects of smokefree: Other views on smokefree effects** *Nearly all staff (97%) believed that patients would find treatment 'more difficult' and that treatment would be 'less successful' (87%).* *Patients: Nearly all those asked (92%) believed that treatment for drug and/or alcohol dependence with a no smoking policy would be 'more difficult' and almost three-quarters (71%) felt that treatment would be 'less successful'.* **Attrition** Not applicable	*The study was a small-scale project that was undertaken to gain some advance information about the possible effects of a no smoking policy on substance misuse inpatients.* *Although the study sample was drawn from both staff and patients in alcohol- and drug-dependence treatment services, and included some patients awaiting admission, the sample sizes were rather small, and a larger-scale survey would be needed to increase the strength of our findings. Also, the findings represent expressed views about future events and responses. The question of how the introduction of a no-smoking policy may affect treatment seeking and treatment responses in practice will need to be measured.* **Future research recommendations** *The question of how the introduction of a no-smoking policy may affect treatment seeking and treatment responses in practice will need to be measured.* **Source of funding**

	Setting *Three specialist substance use treatment wards that were providing treatment for drug dependence, alcohol dependence, or both disorders.*	*years (SD=8.6; range 18–55 years); 52% (n=20) were male. The majority of the patient sample (92%, n=35) were current smokers; 5% (n=2) were former smokers and one person had never smoked. Those patients who were smokers reported smoking an average of 22.1 cigarettes per day (SD=10.57; range 0–40 per day) and had smoked for an average of 23 years (SD=9.62; range 0–47 years). Staff: 44% (n=17) were working on the in-patient alcohol treatment unit, 28% (n=11) on the in-patient drug treatment unit, and 28% (n=11) on the in-patient acute assessment unit. The response rates for these three wards were 68, 38, and 52% respectively. Staff had a mean age of 38.6 years (SD=10.3; range 25–73 years); just under half (44%) were male. A range of occupational groups responded to the questionnaire: this included nursing staff*			Not reported

		(64%); medical staff (10%); administrative staff (10%); occupational therapy staff (8%); and psychology (8%). Staff had been working in the addictions field for an average of 4.4 years (SD54.25; range 0–15 years). Just under a third of staff (31%) were current smokers; one-third (33%) were former smokers and just over one-third (36%) had never smoked. **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable			
Authors *Hudzinski & Frohlich* **Year** 1990 **Aim of study** *To research how tobacco smoke affects employees and patients of a healthcare institution, the acceptance of a no-smoking policy before and after its implementation, and*	**Country** USA *Louisiana* **Urban/rural setting** Not reported **Secondary Care setting** Both **Source population** Patients Staff *Employees and staff physicians* **Source population demographics**	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented 1986* **When assessed** Before implementation – single time-point	**Primary outcomes** Attitudinal outcomes *Support for the ban (staff and patients) using Likert-scales* **Follow-up periods** Follow-up period(s) *12 months and 18 months* **Method of analysis** *Responses (nominal and ordinal data) were coded and the "data were analysed using survey statistical*	**Attitudes to smokefree: Staff** *Support for the ban: Pre-policy, 77% of all hospital staff favoured the no-smoking policy, 75% favoured the policy 6 months after implementation, increasing to 84% of all hospital staff who favoured the policy 12 months after implementation.* **Attitudes to smokefree: Patients** *Support for the ban: Pre-policy, 82% of hospital patients surveyed favoured the no-smoking policy, 93% favoured the policy 6 months after implementation, and 80% favoured the policy 12 months after implementation.* **Attrition**	**Limitations identified by author(s)** *Uncontrolled factors may have influenced the results; repetitive questionnaires may have sensitized employees and patients in their responses; smoking cessation programs may have influenced employees' attitudes rather than the policy itself or the national trend in stopping smoking.* **Limitations identified by**

the consequences of the policy on the smoker (particularly confined to responses of employees). **Study design** Before-and-after study (with same sample after intervention) **Quality score** + **External validity score** +	None reported **Recruitment** *Questionnaire (including statement of purpose and completion instructions) mailed to all employees and to +2000 randomly selected patients. The same individuals were re-contacted and invited to respond to a similar questionnaire 6 and 12 months later.* **Population selection criteria** Inclusion criteria *All employees (including medical and scientific staff)* Inclusion criteria not reported *For patients* Exclusion criteria not reported % participation agreement *Employees: 46% (pre-ban), 38% (6m post-ban), 16% (12m post-ban)* % participation not reported *For patients* **Potential sources of bias (association)** - *low staff response rate (same sample): 46% (pre-ban), 38% (6m post-ban), 16% (12m post-ban); no patient response rate reported; excl criteria NR for patients; no data for non-responders* **Setting** *A health care institution (clinic and medical foundation) with inpatient units employing staff*	*6 months pre-ban* After implementation – multiple time-points *6 months post-ban and 12 months post-ban* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) Ban exclusions (write in) *Permitted on the acute psychiatry inpatient unit by physician approval* Other (write in) *A "comprehensive campus-wide smokefree environment"* **Supporting strategies/interventions** Implementation committee *Smoke-Free Task Force (included clinicians, psychologists, and administrative personnel from public affairs and employee relations departments)* **Sample size** Total sample *Employees: n=1946 (pre-ban), n=1608 (6m post-ban), n=684 (12m post-ban)*	*methods (Rosenberg 1986)". All physician data were collapsed into the employee response category.*	Not applicable	**review team** *Same sample but may have become desensitised to questionnaire; no control group.* **Evidence gaps/future research recommendations** None reported **Source of funding** Not reported

	physicians and psychologists.	*Sample characteristics: At 12 months follow-up: 18% physicians 82% other employee; 4% <35years, 29% 35-44 years, 27% ≥45 years; 29% male.* *Patients: n=607 (pre-ban), n=397 (6m post-ban), n=600 (12m post-ban)* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not reported			
Authors *Jones & Williams* **Year** 2010 **Aim of study** *The aims of this study were (i) to determine smoking prevalence by employees of The Queen Elizabeth Hospital and to compare this with employees of other hospitals and (ii) to ascertain employees' perspectives regarding smoking on hospital grounds.* **Study design**	**Country** Australia **Urban/rural setting** Urban *Royal Adelaide Hospital (RAH)* *Flinders Medical Centre (FMC)* *The Queen Elizabeth Hospital (TQEH)* Rural *Alice Springs Hospital (ASH)* **Secondary Care setting** Both **Source population** Staff *TQEH: Approx. 2200 staff* *ASH: 725 staff* *RAH: 3640 staff* *FMC: 2920 staff* **Source population**	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place **When assessed** After implementation – single time-point *FMC and ASH - 2004* *RAH - 2005* *TQEH - 2007* **Where** Not reported **Smokefree coverage** Smokefree building(s) **Supporting strategies/interventions** Cessation support	**Primary outcomes** Attitudinal outcomes *Questionnaires asked about:* *1) Perceptions on the acceptability of smoking in areas visible to the public* *2) Support for complete ban on smoking on campus* *3) Support for providing areas where smoking is allowed* **Follow-up periods** Not applicable **Method of analysis** Not reported	**Attitudes to smokefree: Staff** *Area should be provided (%): ASH 92.9%; FMC 92.4%; RAH 87.7%; TQEH 92.1%.* *Support complete ban (%): ASH 5.5%; FMC 14.3%; RAH 19.9%; TQEH 15.0%.* *Not acceptable to smoke visibly (%): ASH 45.3%; FMC 67.6%; RAH 57.6%; TQEH 62.0%.* **Attrition** Not applicable	**Limitations identified by author(s)** *One limitation of our study was the self-reported nature of the surveys. Given the awareness of the harmful effects of tobacco smoking reported by employees in these surveys, it is likely that more smokers than non-smokers would not complete the questionnaire. The surveys were conducted in a similar fashion (namely the same questions asked, the same financial incentives offered, etc.) at each hospital, but it is likely that local differences (e.g. pay slips not being*

Cross-sectional study **Quality score** + **External validity score** +	**demographics** None reported **Recruitment** *Employee names were obtained from the respective pay office or human resource departments of each hospital and a single-page questionnaire was forwarded either directly to each employee through internal mail or attached to pay slips.* **Population selection criteria** Inclusion criteria *All staff* Exclusion criteria not applicable % participation agreement *TQEH: 54-59%* *RAH: 43%* *FMC: 50%* *ASH: 39%* **Potential sources of bias (association)** ++ **Setting** *Four South Australian/Northern Territory hospitals.* *Royal Adelaide Hospital (RAH): approximately 550 beds.* *Flinders Medical Centre (FMC): approximately 480 beds.* *The Queen Elizabeth Hospital (TQEH): approximately 320 beds.* *Alice Springs Hospital (ASH)*	*TQEH* Pharmacotherapies/NRT *TQEH* **Sample size** Total sample *Not reported.* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable			*delivered to employees of ASH) may have differently affected response rates.* **Evidence gaps/future research recommendations** None reported **Source of funding** Other
Authors *Kannegaard et al* **Year**	**Country** Denmark **Urban/rural setting**	**Method of allocation** Not applicable **Smokefree**	**Primary outcomes** Attitudinal outcomes • *Satisfaction with*	**Attitudes to smokefree: Staff** *Satisfaction with prohibition on smoking in the hospital compared with smoking*	**Limitations identified by author(s)** *'When our study was*

2005 **Aim of study** *The purposes of this study are the following: (1) to illustrate smoking habits and attitudes to smoking among a hospital staff and (2) to illustrate possible changes in these subjects over a 2-year period before an announced status for the hospital as a non-smoking hospital* **Study design** *Cross-sectional study (2 time-points before implementation)* **Quality score** ++ **External validity score** ++	Not reported **Secondary Care setting** Not reported **Source population** Staff **Source population demographics** None reported **Recruitment** *In both of the surveys, an anonymous questionnaire was sent to every member of the staff with an addressed envelope thereby facilitating the return of the questionnaire. Questionnaires were sent by internal post.* **Population selection criteria** Inclusion criteria (write in) *Full and part-time hospital staff.* Exclusion criteria not reported % participation agreement *1999: 76%* *2001: 75.2%* **Potential sources of bias (association)** ++ **Setting** *A Danish hospital.*	**implementation stage** Smokefree impending *Jan 2002* **When assessed** Before implementation – multiple time-points *June 1999* *June 2001* **Where** Not reported **Smokefree coverage** Smokefree building(s) **Supporting strategies/interventions** Not reported **Sample size** Total sample *1999: n=729* *2001: n=729* *Approximately 85% of the staff are women and almost 15% were men in both studies. In 1999, 33% of the staff answered that they were smokers, while in 2001 only slightly more than 26% were smoking daily or nondaily.* **Baseline comparison** Not applicable **Study sufficiently powered? (association)**	*smoking prohibition in the hospital* *• Attitudes towards implementing sanctions towards staff who broke smoking prohibitions (after only)* **Follow-up periods** Follow-up period(s) *2 years.* **Method of analysis** *Statistical significance was evaluated using both chi square-tests and partial gamma coefficients for ordinal data.*	*status of responder* *1999* *Smoker, daily: satisfied 48.5% (N = 94); not satisfied 51.5% (N = 100); total 100.0% (N = 194)* *Smoker, non-daily: satisfied 87.8% (N = 36); not satisfied 12.2% (N = 5); total 100.0% (N = 41)* *Ex-smoker: satisfied 88.2% (N = 157); not satisfied 11.8% (N = 21); total 100.0% (N = 178)* *Never smoked: satisfied 95.2% (N = 277); not satisfied 4.8% (N = 14); total 100.0% (N = 291)* *Total: satisfied 80.1% (N = 564); not satisfied 19.9% (N = 140); total 100.0% (N = 704)* *2001* *Smoker, daily: satisfied 21.1% (N = 43); not satisfied 70.9% (N = 105); total 100.0% (N = 148)* *Smoker, non-daily; satisfied 90.3% (N = 28); not satisfied 9.7% (N = 3); total 100.0% (N = 31)* *Ex-smoker: satisfied 87.2% (N = 164); not satisfied 12.8% (N = 24); total 100.0% (N = 188)* *Never smoked; satisfied 96.6% (N = 311); not satisfied 3.4% (N = 11); total 100.0% (N = 322)* *Total: satisfied 79.2% (N = 546); not satisfied 20.8% (N = 143); total 100.0% (N = 689)* *( ) indicates the actual number.* *P < 0.0005 in 1999 and 2001.* **Other factors: Other** *Attitudes towards sanctions on staff who brake smoking prohibition.* *2001 study only. Of 91.6% of respondents who answered this question, 33.5% think*	*conducted in 2001, only half a year remained before the hospital became a no-smoking hospital. After the first study in 1999, many initiatives were made to focus on the importance of smoking cessation, such as posters, information, competition and free smoking cessation courses for the staff. Not everyone was satisfied with the decision to turn the hospital into a no-smoking workplace. Our study could not show that the staff's attitude towards smoking has been changed due to the special preventive effort at the hospital over this 2-year period. The aim for the preventive work has been to change the staff's knowledge on smoking and thereby their smoking habits. Results show that the habits have changed, whereas the data are not able to show any effect on the staff's attitude.'* **Evidence gaps/future research recommendations** None reported

		Not reported		*that sanctions should be implemented towards staff who broke the prohibition of smoking at the hospital.* *Taking gender into consideration, the numbers show a higher level of acceptance of sanctions among men than women. A significant (P < 0.008) higher number of women have a negative attitude towards sanctions. 68.6% of the female staff say No to sanctions whereas only 54.5% of the male staff say No.* **Attrition** Not applicable	**Source of funding** Not reported
Authors *Lewis, Shin & Davies* **Year** 2011 **Aim of study** *To estimate the current smoking habits of health care professionals (HCPs) in a country with active tobacco control measures, and to record their attitudes to national and hospital tobacco bans.* **Study design** Cross-sectional study *A simple questionnaire that took less than 5 minutes to complete.* **Quality score** + **External validity**	**Country** Wales **Urban/rural setting** Not reported **Secondary Care setting** Both **Source population** Staff *All healthcare professionals and medical nursing students in the health board.* **Source population demographics** Occupation *All healthcare professionals and medical nursing students in the health board.* **Recruitment** Recruitment method *Opportunistic sampling: Healthcare professionals approached during breaks or staff change-overs and invited to take part.*	**Method of allocation** Not reported **Smokefree implementation stage** Smokefree in place **When assessed** After implementation – single time-point **Where** Both *Secondary care of all specialities.* **Smokefree coverage** Smokefree building(s) Smokefree grounds **Supporting strategies/interventions** Cessation support **Sample size** Total sample *n=500* *The mean (SD) age of the responders was*	**Primary outcomes** Attitudinal outcomes *Support for hospital ban.* **Follow-up periods** Not applicable **Method of analysis** *We used the Statistical Package for Social Sciences, Version 17.0 and Stata v11.1. Following tests for normality, continuous data were described with means and standard deviations (SDs), or medians and interquartile ranges (IQRs), and categorical data were compared with the χ2 test. Odds ratios (ORs) were calculated using the cci function, the 95% confidence intervals (CI) are exact and P values are Fisher's exact two-*	**Attitudes to smokefree: Staff** *Overall, 57% of HCPs wanted a complete ban on smoking in hospital grounds and 40% preferred a partial ban, with designated smoking areas on hospital grounds; 1% thought there should be no ban and 3% declined to answer.* *There was only one statistically significant difference between HCP groups with regard to the attitude to bans on hospital premises. The very small numbers supporting no ban, five in total, were combined with those supporting a partial ban. This combined group was compared with those supporting a complete ban. Doctors had the highest support for a total ban (68.5%), followed by students (59.0%), AHPs (57.8%) and nurses (52.0%). The difference between doctors and nurses was statistically significant (OR 2.01, 95% CI 1.14–3.56, P = 0.01).* **Attrition** Not applicable	**Limitations identified by author(s)** *We had very few responses from psychiatric health workers; this reflects their geographical separation from the main hospitals where the student researcher worked, rather than response bias.* *Our selection of participants was not a random sample, but was opportunistic. Thus it could be biased to those who, for example, like to take longer breaks and—perhaps representing a bias towards smokers—staff who take longer in handovers or are more likely to attend post-graduate meetings.* **Evidence gaps/future research**

score +	**Population selection criteria** Inclusion criteria *All healthcare professionals and medical nursing students in the health board.* Exclusion criteria not reported % participation agreement *500/607 = 83%* **Potential sources of bias (association)** - *Opportunistic sampling. This may have resulted in a biased sample.* **Setting** *All seven hospitals of Hywel Dda Health Board, providing health care to a population of around 372 000 people in Wales.*	*36.4 (11.9) years (range 18–70); 72% were female. Overall, 7% of responders said they were current smokers, 21% were ex-smokers and 71% reported never smoking (defined as fewer than 100 cigarettes in their lifetime).* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable	*sided.*		**recommendations** None reported **Source of funding** Not reported
Authors *Matthews et al.* **Year** 2005 **Aim of study** *To evaluate implementation of a smoking ban on an acute crisis stabilization (psychiatric) unit for men.* **Study design** Before-and-after study (with different sample after intervention) **Quality score** -	**Country** USA *North Carolina* **Urban/rural setting** Not reported **Secondary Care setting** Mental Health **Source population** Staff *Nursing staff* Specific Ward(s)/Department(s) *Male acute crisis stabilization unit* **Source population demographics** None reported **Recruitment** *Not reported.*	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented 21 Oct '02* **When assessed** Before implementation – single time-point *Date of pre-ban staff survey not reported* After implementation – single time-point	**Primary outcomes** Attitudinal outcomes *Staff: the ban's benefits, ethics, and problems they expected and encountered* **Follow-up periods** Not reported **Method of analysis** *Categorical data by Chi Square except in cases of a low frequency in one of the cells, when Fischer's exact (two-tailed) test was substituted. Continuous data were assessed using a Student's t test.*	**Attitudes to smokefree: Staff** *Pre-implementation, 6 of the 14 nursing staff respondents believed banning smoking would be helpful, increasing to 13 of 13 respondents post-implementation who respondents believed the intervention had been helpful (p=0.002). [Direction of effect supports smokefree]* **Beliefs - people's rights: Other rights issues** *Pre-implementation, 5 of the 11 nursing staff respondents believed banning smoking was ethical (3 non-responders), increasing to 10 of 12 respondents post-implementation who believed it was ethical (1 non-responder) (p=0.089). [Direction of effect supports smokefree]* **Other factors: Success of implementation** *Pre-implementation, 8 of the 14 nursing staff respondents were concerned about*	**Limitations identified by author(s)** *Staff perceptions of increased contraband, not supported by the data, may suggest problems with data collection.* **Limitations identified by review team** *Paper lacks detail on methods/analysis* **Future research recommendations** *To determine whether there are any post-discharge benefits or possible risks from abrupt smoking cessation in acute psychiatric patients.* **Source of funding**

External validity score -	**Population selection criteria** Inclusion criteria not reported Exclusion criteria not reported % participation agreement *Staff 58% (pre-ban) 54% (post-ban)* **Potential sources of bias (association)** - *NA for patient data (no recruitment, data taken from records); No inclusion/exclusion for staff, low participation rate: 58% (pre-ban) 54% (post-ban)* **Setting** *An 18-bed acute crisis stabilization unit where all male patients are first admitted, for up to 3 days, by which time patients are either discharged or referred to the male acute treatment unit. The unit is within Dorothea Dix State Psychiatric Hospital, which provides care to people in the south central region of North Carolina. Approx. 3,000 patients (1,800 men, 1,200 women) are admitted to adult psychiatry service per year (approx. 95% involuntarily).*	*Date of post-ban staff survey not reported* **Where** Mental Health **Smokefree coverage** Not reported *Described as "smoking ban"* **Supporting strategies/interventions** Cessation support *Patients - education about nicotine addiction and withdrawal* Pharmacotherapies/NRT *Patients - given nicotine gum (up to 12 mg per day was typically prescribed) or patches (offered in 7 mg, 14 mg, or 21 mg strengths (depending on the number of cigarettes the patients had reported smoking prior to admission)) to ease withdrawal symptoms.* **Sample size** Total sample *Nursing staff n=14 (pre-ban) n=13 (post-ban)* **Baseline comparison** Not applicable		*problems they anticipated related to the intervention, decreasing to none of the 13 respondents being concerned post-implementation (p=0.002). [Direction of effect supports smokefree]* **Attrition** Not applicable	Not reported

		Study sufficiently powered? (association) Not reported			
Authors *Parks et al* **Year** 2009 **Aim of study** *To investigate the problem of resistance to smoking restrictions and specifically compliance with smoke-free policy.* **Study design** Cross-sectional study **Quality score** + **External validity score** ++	**Country** England **Urban/rural setting** Not reported **Secondary Care setting** Both **Source population** Staff *All hospital staff n=6981* **Source population demographics** None reported **Recruitment** *Staff were made aware of the study through the hospital's Communications Department and a prize draw was offered as an incentive. The questionnaire could be completed either online, via the hospital intranet using Apollo (an original, secure, online survey application) or as a paper copy, available to those members of staff who had no access to computers in order to maximise returns.* **Population selection criteria** Inclusion criteria *All staff eligible* **Potential sources of bias (association)** ++	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *January 2006* *Six months after data collection (March 2008), the hospital formally relaxed its smoking policy and reintroduced smoking shelters.* **When assessed** After implementation – single time-point *March 2008* **Where** Not reported **Smokefree coverage** Smokefree building(s) Smokefree grounds **Supporting strategies/interventions** Not reported **Sample size** Total sample *n=704* *The demographic composition of our sample was largely representative of the*	**Primary outcomes** Attitudinal outcomes *Attitudes towards smoke-free policy.* **Follow-up periods** Not applicable **Method of analysis** *The demographic information gathered from respondents was analysed and described for gender, age, job and ethnicity. Comparison between compliant and non-compliant smokers was made based on calculated scores for the Fagerström test, Horn-Waingrow scale and level of agreement with questions about attitudes. For ordinal data, a linear-by-linear association test was used to assess whether there was a significant difference between the two groups of smokers. For the Horn-Waingrow scale, the Mann-Whitney test was used to determine any significant differences in two non-parametric independent variables.*	**Attitudes to smokefree: Staff** *The hospital is right to have such a policy: non-smokers 85.3%; compliant smokers 36.8%; non-compliant smokers 34.4%* **Beliefs - effects of smokefree: Other views on smokefree effects** *The policy protects people against passive smoke: non-smokers 61.6%; compliant smokers 35.8%; non-compliant smokers 48.4%* **Planning & resource issues: Smoking cessation services** *Smokers don't get enough help from the hospital if they want to quit: non-smokers 16.1%; compliant smokers 43.5%; non-compliant smokers 37.5%* **Communication issues: Staffs' familiarity/understanding of policy** *I am aware of this policy: non-smokers 100%; complaint smokers 100%; non-compliant smokers 100%* **Other factors: Other** *The policy is adequately enforced: non-smokers 20.7%; compliant smokers 18.8%; non-compliant smokers 46.9%* **Attrition** Not applicable	**Limitations identified by author(s)** '*The study is limited by the size of our sample, which represents only one tenth of the eligible population. Larger responses would have been difficult to achieve in this setting, as effective communication within a sizeable teaching hospital can be difficult. Despite anonymity and dissociation from their employer, recall bias will inevitably have affected the way the staff answered questions about compliance and smoking behaviour for fear of repercussions. We are further limited by our failure to include incomplete questionnaires in the analysis but, given there were only 35 smokers amongst the incomplete questionnaires and no method for handling missing data is without limitation, the impact of this is likely to*

	Setting *Addenbrooke's Hospital: a large NHS quaternary referral centre with 1,170 beds and 6,981 staff (2007/8), located in Cambridge, UK.*	*hospital's working population for gender, age, job profile and ethnicity. There were however differences: those aged 25 years or under were over-represented compared to those aged 26 to 45 years, men were over-represented and healthcare staff (professional and auxiliary) were under-represented. In terms of reported smoking profile, 14.3% (95% CI, 12.0 – 17.1%) were smokers, 21.7% (95% CI 18.8 – 24.9%) were ex-smokers and 63.9% (95% CI 60.3 – 67.3%) had never smoked.* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable	*For questions relating to attitudes, the Fisher's Exact test was used to test for any association between smoking status, compliance and agreement to the questions. The 95% confidence intervals (CI) for proportions were estimated by approximation to the binomial distribution and the use of exact methods. A p value of less than 0.05 was considered to be significant.*		*be minimal.'* **Future research recommendations** *'We advocate further observational studies to examine the impact of proactive interventions that specifically address nicotine dependence and psychological addiction amongst non-compliant smokers.'* **Source of funding** Voluntary/Charity
Authors *Patten et al.* **Year** 1995 **Aim of study** *To evaluate the effects of the*	**Country** USA *Minnesota* **Urban/rural setting** Not reported **Secondary Care setting**	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree**	**Primary outcomes** Attitudinal outcomes *Staff support for the policy; comparison of what expected with what observed following implementation.*	**Attitudes to smokefree: Staff** *Support for the policy: Pre-implementation, 49% of all staff were in favour of the smokefree policy, 44% did not support the policy and 7% were undecided or did not give a response.* *Post-implementation, different outcomes*	**Limitations identified by author(s)** *Low response rate at follow-up limits the extent to which findings can be generalised. No biochemical validation of psychiatric patients'*

smokefree policy on the behavioural functioning of patients and on staff attitudes. Also to examine long term smoking status of patients who were admitted to hospital after implementation of the smokefree policy **Study design** Before-and-after study (with different sample after intervention) Cross-sectional study **Quality score** + **External validity score** +	Mental Health **Source population** Staff **Source population demographics** None reported. **Recruitment** *Staff survey distributed to staff in the units (no further details).* Not applicable **Population selection criteria** Inclusion criteria *Staff survey – all staff in the 3 adult psychiatric units at Saint Marys Hospital (1 locked, 2 open units)* Exclusion criteria not reported % participation agreement *Staff survey 67% (pre-ban) 56% (post-ban)* **Potential sources of bias (association)** - *NA for patient data (no recruitment, data taken from records); unlikely for the staff and follow-up patient surveys - self-selecting and no detail of non-responders. Although reports responses from a range of staff occupations across the wards.* **Setting** *A 28-bed locked adult inpatient psychiatric unit in Saint Marys Hospital, Rochester, Minnesota.*	**implementation stage** Smokefree in place *Implemented 1 Jan '91* **When assessed** Before implementation – single time-point *Staff survey 6 months pre-implementation* After implementation – single time-point *Patient survey 16-18 months post-discharge; Staff survey 6 months post-implementation* **Where** Mental Health *Locked inpatient psychiatric unit* **Smokefree coverage** Smokefree building(s) Smokefree grounds Ban exclusions *Patients with off-unit privileges, at an appropriate level, were granted brief passes to leave the building unaccompanied to smoke ("very few patients")* **Supporting strategies/interventions** Implementation committee Cessation support	**Follow-up periods** Not applicable *patient survey* **Method of analysis** Not reported *Survey data presented as proportions only (no p values)*	*were measured to indicate the level of staff support for the policy. 76% of all staff agreed that they 'Would recommend that other adult psychiatric units be smokefree', 13% of all staff responded they would not. 71% of all staff responded that they would not 'Recommend that the adult psychiatric units not remain smokefree', 21% of all staff responded they would. Sub-group differences by smoking status: 78% of current staff smokers (76% former staff smokers, 81% staff never smokers) agreed that they 'Would recommend that other adult psychiatric units be smokefree', no current staff smokers (21% former staff smokers, 13% staff never smokers) responded they would not. 44% of current staff smokers (82% former staff smokers, 75% staff never smokers) responded that they would not 'Recommend that the adult psychiatric units not remain smokefree', 44% of current staff smokers (18% former staff smokers, 20% staff never smokers) responded they would.* **Other factors: Success of implementation** *What expected with what observed following implementation: Asked to compare what they had expected to what they had observed about smokefree implementation in the adult psychiatric (locked and unlocked) units, 62% all staff post-implementation responded it was much or somewhat easier, 22% responded it was neither more difficult nor easier, 6% responded it was somewhat more difficult than expected, and 10% did not respond.* *61% of all staff post-implementation, reported that the smokefree policy was 'working well' in the adult psychiatric*	*smoking status.* **Limitations identified by review team** *Risk of self-selection bias, unvalidated outcome measures, no control group* **Evidence gaps** *Little known about the long term smoking status of psychiatric patients after hospital admission in a smokefree unit* **Future research recommendations** *Research to determine which smoking cessation procedures are most effective and acceptable to psychiatric patients.* **Source of funding** Not reported

		Patients' weekly support group led by Nicotine Dependence Center Pharmacotherapies/NRT *Nicotine gum (patients)* Other *Staff education sessions on the treatment of nicotine dependence; written information for patients* **Sample size** Total sample *STAFF (survey sample) n=137 (pre-ban) n=126 (post-ban)* *Sample characteristics - Smoking status: Current smokers 9.5% (pre-) 7% (post-), former smokers 36.5% (pre-) 26% (post-), never smokers 52.0% (pre-) 63% (post-), no response 2.0% (pre-) 4% (post-).* *Occupation: Responses from staff psychiatrists and psychologists, resident physicians, nurses, nurse clinicians, psychiatric social workers, activity therapists and unit assistants from all 3 units (pre-). 90% (post-*		*(locked and unlocked) units, 19% indicated that it was 'working alright', 12% indicated it was 'not working well', and 9% were undecided or did not respond.* **Attrition** Not applicable	

		) work involved direct contact with patients in the psychiatric units. **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not reported			
Authors *Praveen et al* **Year** 2009 **Aim of study** *To explore attitudes of in-patient mental health staff to smoking and a smoking ban.* **Study design** Cross-sectional study **Quality score** + **External validity score** -	**Country** England **Urban/rural setting** Not reported **Secondary Care setting** Mental Health **Source population** Staff **Source population demographics** None reported **Recruitment** *Questionnaires distributed to staff in the mental health units where the researchers worked.* **Population selection criteria** Inclusion criteria not reported Exclusion criteria not reported % participation agreement *68.4%* **Potential sources of bias (association)** - *Did not use random sampling* **Setting** *In-patient mental health units*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree impending *Due to be implemented in July 2008.* **When assessed** Before implementation – single time-point *December 2006-February 2007.* **Where** Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/interventions** Not reported **Sample size** Total sample *n=308* *55.5% female; 37.3% male; 7.1% no response*	**Primary outcomes** Attitudinal outcomes • *'Should service users be allowed to smoke on the ward?'* • *'Where should staff and service users be allowed to smoke? (designated indoor areas, outdoors, total ban)* • *'Should staff be allowed to smoke with service users?'* • *'Are there any benefits in allowing staff to smoke with service users?'* • *'Should cigarettes be given to service users to achieve therapeutic goals?'* • *'Do service users become more agitated or deteriorate in their mental health if they are not allowed to smoke?'* • *'Which aspect of service users health will benefit from the smoking ban?' (mental*	**Attitudes to smokefree: Staff** *Where should staff and service users be allowed to smoke?* *Designated indoor areas (smoke room): 148 (48.1%) all staff: 49 (15.9%*) smokers; 97 (31.5%*) non-smokers; 9 (52.9%) managers; 59 (50.9%) registered nurses; 22 (53.7%) doctors; 53 (44.2%) others.* *Outdoors: 132 (42.9%) all staff: 37 (12.0%*) smokers; 95 (30.8%*) non-smokers; 7 (41.2%) managers; 53 (45.7%) registered nurses; 17 (41.5%) doctors; 46 (38.3%) others.* *Total ban: 70 (22.7%) all staff; 2 (0.6%*) smokers; 68 (22.1%*) non-smokers; 5 (29.4%) managers; 23 (19.8%) registered nurses; 8 (19.5%) doctors; 33 (27.5%) others.* *No response: 2 (0.6%) all staff; 1 (0.3%*) smokers; 1 (0.3%*) non-smokers; 0 managers; 1 (0.9%) registered nurses; 0 doctors; 1 (0.8%) others.* **proportion of all respondents* **Beliefs - people's rights: Smokers' right to smoke** *Should service users be allowed to smoke on the ward?*	**Limitations identified by author(s)** *Random sampling was not used, which might have led to sampling bias.* *There might have been a self-report bias among respondents and it could be argued that staff with strong views on the smoking ban, or those affected by it, were more likely to respond.* *Also, some would argue that using a questionnaire with tick-box options might limit the range of responses.* **Evidence gaps/future research recommendations** None reported **Source of funding** Not reported

	(acute adult wards, rehabilitation wards, elderly wards and low secure units) in 3 locations.	*Occupation: 5.5.% managers; 37.7% registered nurses; 13.3% doctors; 38.9 other; 4.5% no response* *Age groups (years): 16-25 10.1%; 26-35 32.8%; 36-45 25.9%; 46-55 19.2%; 56-65 8.8%; No response 3.2%.* *23.1% smokers; 76.3% non-smokers; 0.6% no response.* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable	*health, physical health, both, neither)* • *'How will the efficiency of staff who smoke be affected by the smoking ban policy?' (improved, reduced)* **Follow-up periods** Not applicable **Method of analysis** Not reported	*Yes: 143 (46.4%) all staff; 53 (17.2%*) smokers; 88 (28.6%*)non-smokers* *No: 157 (50.9%) all staff; 15 (4.9%*) smokers; 142 (46.1%*) non-smokers* *No response: 8 (2.6%) all staff; 3 (0.9%*) smokers; 5 (1.6%*) non-smokers* **proportion of all respondents* **Beliefs - effects of smokefree: "Smokefree affects patients' mental health"** *Do service users become more agitated or deteriorate* *in their mental health if they are not allowed to smoke?* *Yes: 243 (78.9%) all staff; 66 (21.4%*) smokers; 175 (56.8%*) non-smokers* *No: 41 (13.3%) all staff; 1 (0.3%*) smokers; 40 (12.9%*) non-smokers* *No response: 24 (7.8%) all staff; 4 (1.3%*) smokers; 20 (6.5%*) non-smokers.* *Which aspect of service users' health will benefit from* *smoking ban?* *Mental health: 45 (14.6%) all staff; 2 (0.6%*) smokers; 43 (13.9%*) non-smokers* *Physical health: 196 (63.6%) all staff; 21 (6.8%*) smokers; 173 (56.2%*) non-smokers* *Both: 95 (30.8%) all staff; 40 (12.9%*) smokers; 45 (14.6%*) non-smokers* *Neither: 13 (4.2%) all staff; 10 (3.3%*) smokers; 3 (0.9%*) non-smokers* *No response: 14 (4.5%) all staff; 9 (2.9%*) smokers; 5 (1.6%*) non-smokers* **proportion of all respondents* **Beliefs - effects of smokefree: "Smokefree affects patients' physical health"** *Which aspect of service users' health will*	

				benefit from *smoking ban?* *Mental health: 45 (14.6%) all staff; 2 (0.6%*) smokers; 43 (13.9%*) non-smokers* *Physical health: 196 (63.6%) all staff; 21 (6.8%*) smokers; 173 (56.2%*) non-smokers* *Both: 95 (30.8%) all staff; 40 (12.9%*) smokers; 45 (14.6%*) non-smokers* *Neither: 13 (4.2%) all staff; 10 (3.3%*) smokers; 3 (0.9%*) non-smokers* *No response: 14 (4.5%) all staff; 9 (2.9%*) smokers; 5 (1.6%*) non-smokers* **proportion of all respondents* **Planning & resource issues: Other planning & resource issues** *How will the efficiency of staff who smoke be* *affected by the smoking ban policy?* *Improved: 107 (34.7%) all staff; 3 (0.9%*) smokers; 104 (33.8%*) non-smoking* *Reduced: 105 (34.1%) all staff; 27 (8.8%*) smokers; 78 (25.3%*) non-smokers* *No response: 96 (31.2%) all staff; 41 (13.3%*) smokers; 53 (17.2%*) non-smokers* **proportion of all respondents.* Measured but not reported **Communication issues: Staffs' familiarity/understanding of policy** *Almost all staff (95.4%) were aware of the proposed* *smoking ban.* **Communication issues: Health professional's-Patient's relationship** *Should staff be allowed to smoke with service users?* *Yes: 89 (28.9%) all staff; 30 (9.7%*) smokers; 57 (18.5%*) non-smokers*	

				No: 215 (69.8%) all staff; 40 (12.9%) smokers; 175 (56.8%*) non-smokers* *No response: 4 (1.3%) all staff; 1 (0.3%*) smokers; 3 (0.9%*) non-smokers.* *Are there any benefits in allowing staff to smoke with service users?* *Yes: 119 (38.6%) all staff; 46 (14.9%*) smokers; 71 (23.1%*) non-smokers* *No: 167 (54.2%) all staff; 24 (7.8%*) smokers; 143 (46.4%*) non-smokers* *No response: 22 (7.1%); all staff; 1 (0.3%*) smokers; 21 (6.8%*) non-smokers* **proportion of all respondents.* **Other factors: Other** *Should cigarettes be given to service users to achieve therapeutic goals?* *Yes: 51 (16.6%) all staff; 16 (5.2%*) smokers; 33 (10.7%*) non-smokers* *No: 249 (80.8%) all staff; 52 (16.9%*); smokers; 197 (63.9%*) non-smokers* *No response: 8 (2.6%) all staff; 3 (0.9%*) smokers; 5 (1.6%*) non-smokers* **proportion of all respondents* **Attrition** Not applicable	
Authors *Ratschen, Britton & McNeill* **Year** 2008 *Smoke-free hospitals – the English experience: results from a survey, interviews, and site visits*	**Country** England **Urban/rural setting** Not reported **Secondary Care setting** Both **Source population** Staff *Survey & Interviews: Trust Human Resources Directors or*	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *98% respondents reported smokefree*	**Secondary outcomes** Attitudinal outcomes *Survey + Semi-structure interviews - views referring to selected aspects of policy development; and most frequently named success factors and challenges related to policy implementation*	**Attitudes to smokefree: Staff** *Survey data: Post-implementation of smokefree, representatives from mental health settings in NHS Trusts in England (n=54) were surveyed: 52% respondents believed that the level of policy support by staff differed among staff groups, with nurses being most frequently identified as the least supportive group (32%).* *55% respondents (n=12) participating in semi-structured telephone interviews on*	**Limitations identified by author(s)** *There may be a small degree of reporting bias to the study (formal data requests, study participants largely responsible for implementation); 21% study population did not respond and site visits limited to a small*

2009 *[A further paper, focussed on the study's mental health data]Implementation of smoke-free policies in mental health in-patient settings in England* **Aim of study** *To determine the extent of smoke-free policy implementation in English NHS acute and mental health Trusts, and to explore challenges and impacts related to policy implementation* **Study design** Cross-sectional study Interview study Participant observation *Site visits to triangulate data where possible* **Quality score** + **External validity score** +	*Trust Chief Executives to complete survey on behalf of the trust* **Source population demographics** None reported **Recruitment** Recruitment method *Survey: A list of all English NHS Trusts providing acute and/or mental health services in inpatient facilities was purchased. Questionnaire issued all 245 Trusts by post (also accessible for online completion) in Feb '07. Two reminder letters were sent to non-respondents after 3 and 6 weeks. Formal EIR data request made after 10 weeks.* *Semi-structured telephone interviews: a 30% sample of survey respondents who indicated availability for an interview were re-contacted.* *Rev 6 only: Site visits: Trust sites chosen due to their easy accessibility to the investigator* **Population selection criteria** Inclusion criteria *Survey & Interviews: HR Directors or Chief Executives of English NHS Trusts providing acute and/or mental health services in inpatient facilities.* *Rev 6 only: Site visits: easily accessible by investigator* Exclusion criteria *Primary healthcare trusts that did not provide mental health in-*	*policies were implemented, pre-national legislation (1 Jul '07) [from the survey results]* Smokefree impending *2% respondents reported date set for smokefree policies to be in place before 1 Jul '07 [from the survey results]* **When assessed** After implementation – single time-point *For 98% respondents* **Where** Both **Smokefree coverage** Smokefree building(s) *16% smokefree buildings (Acute Trusts); 29% smokefree buildings (Mental Health settings) [from the survey results]* Ban exclusions *Mental Health Settings (78%); Acute Trusts (50%) (for bereaved/distressed relatives (45%), sheltered outdoor areas (25%), smoking rooms (6%)); for psychiatric patients in 15% Acute Trusts, 65% in mental health*	**Follow-up periods** Not applicable **Method of analysis** *Survey: responses coded and entered into SPSS (v.14.0) to generate outcome measures; free text comments summarised according to recurring themes.* *Interviews: responses allocated to predefined/emerging categories.*	*the experience of smokefree implementation in NHS Trusts in England, believed that a changed attitude towards smoking in public places after July 2007 would facilitate enforcement in the future.* **Beliefs - effects of smokefree: "Smokefree affects patients' mental health"** *Survey data: Post-implementation of smokefree, representatives from mental health settings in NHS Trusts in England (n=54) were surveyed: 17% respondents believed that the aggravation of mental health problems posed implementation difficulties.* **Beliefs - effects of smokefree: "Smokefree results in changed patient aggression/management issues"** *68% respondents (n=15) participating in semi-structured telephone interviews on the experience of smokefree implementation in NHS Trusts in England, stated concerns regarding aggression and abuse, when challenging patients and visitors who smoked onsite, to explain the reluctance of staff to engage actively in enforcement.* **Beliefs - effects of smokefree: "Smokefree results in changed medication issues"** *Survey data: Post-implementation of smokefree, representatives from mental health settings in NHS Trusts in England (n=54) were surveyed: 34% respondents believed that problems related to the dosage of antipsychotic medication in the context of changed smoking behaviour posed implementation difficulties.* **Planning & resource issues: Staff workload/resourcing**	*subsample, thus limiting the generalzsability of results; self-selection bias may affect interview data; mental health settings site visits would have benefited from permission to access non-public areas for detailed observation.* **Limitations identified by review team** *Possible respondent reporting bias. Reasonable interview and survey response rate however based on 1 employee's observations per hospital (survey); triangulated study design* **Evidence gaps** *A set of defined smoke-free indicators would be useful to assess policy implementation in future, including objective measures of exposure to tobacco smoke* **Source of funding** Other

	patient facilities % participation agreement *Survey: 77% (76% acute Trusts, 79% mental health settings (87% mental health trusts, 46% primary healthcare trusts with mental health in-patient facilities))* *Interviews: 88% (88% acute Trusts, 100% mental health settings)* **Potential sources of bias (association)** + *76% acute Trusts, 79% mental health settings; site visits to convenience subsample* **Setting** *English NHS Trusts providing acute and/or mental health services in inpatient facilities*	*settings [from the survey results]* Other *84% smokefree buildings and grounds, including 41% without exemptions (Acute Trusts); 64% smokefree whole premises, including 13% without exemptions (Mental Health settings); 7% smokefree parts of buildings (Mental Health settings) [from the survey results]* **Supporting strategies/interventions** Posters/signage Staff meetings *Almost 75% Trusts informed staff by disseminating information in meetings or special events [from results section]* Staff letters/payslip notes *Emails, newsletters or Trust intranet* Cessation support *Onsite cessation support for patients, 73% Trusts; cessation classes offered for staff, 95% Trusts [from*		*68% respondents (n=15) participating in semi-structured telephone interviews on the experience of smokefree implementation in NHS Trusts in England, named the 'active involvement of all staff members' as central to policy enforcement.* **Planning & resource issues: Smoking cessation services** *All Trusts with respondents participating in semi-structured telephone interviews on the experience of smokefree implementation in NHS Trusts in England (n=22), reported close collaboration with the NHS Stop Smoking Services.* *41% respondents (n=9) participating in semi-structured telephone interviews on the experience of smokefree implementation in NHS Trusts in England, believed that enhanced support with regard to smoking cessation might add to patients' motivation to stop smoking.* **Planning & resource issues: Structural issues** *55% respondents (n=12) participating in semi-structured telephone interviews on the experience of smokefree implementation in NHS Trusts in England, described litter from cigarette ends on Trust premises as a problem.* **Planning & resource issues: Compliance/Enforcement issues** *64% respondents (n=14) participating in semi-structured telephone interviews on the experience of smokefree implementation in NHS Trusts in England, found staff, patients and visitors "congregating" in front of Trust premises to smoke, and related adverse effects on*	

		results section] Pharmacotherapies/NRT *For patients from the hospital pharmacy, 77% Trusts; For staff, free or reduced NRT, 55% Trusts [from results section]* Other *Admissions assessments, 45% Trusts; implementation budget, 24% acute Trusts and 19% mental health settings; [from results section]* **Sample size** Total sample *Survey: n=186 Trusts* *Sample characteristics: n=132 acute Trusts (69% Trusts comprising >1 site) ; n=54 mental health settings (n=48 mental health trusts, n=6 primary healthcare trusts with providing mental health in-patient facilities) (100% Trusts comprising >1 site)* *Telephone interviews: n=22* *Sample characteristic: n=15 acute Trust staff n=7 mental health setting staff* **Baseline comparison**		*Trust image and environment, challenging.* **Communication issues: Availability of information** *77% respondents (n=17) participating in semi-structured telephone interviews on the experience of smokefree implementation in NHS Trusts in England, regarded 'extensive communication and promotion of the smokefree policy and its constant reinforcement' as crucial for policy success.* **Communication issues: Health professional's-Patient's relationship** *Survey data: Post-implementation of smokefree, representatives from mental health settings in NHS Trusts in England (n=54) were surveyed: 36% respondents believed that adverse effects of the smoke-free policy on the clinician–patient relationship posed implementation difficulties.* **Communication issues: Other communication issues** *68% respondents (n=15) participating in semi-structured telephone interviews on the experience of smokefree implementation in NHS Trusts in England, mentioned difficulties in sustaining policy enforcement in certain areas, such as entrances and A&E departments.* **Other factors: Safety issues** *Post-implementation of smokefree, representatives from mental health settings in NHS Trusts in England (n=54) were surveyed: 91% respondents agreed that 'psychiatric settings encountered specific problems with regard to smoke-free policy implementation': specifically, respondents believed that 'the high*	

		Not applicable **Study sufficiently powered? (association)** Not reported		*prevalence of smoking among service users' (81%) and concomitant 'safety issues' (70%) were of concern.* **Other factors: Success of implementation** *32% respondents reported that the policy's implementation had had a beneficial impact on the Trust's image.* **Other factors: Other** *23% respondents (n=5) participating in semi-structured telephone interviews on the experience of smokefree implementation in NHS Trusts in England, regarded the 'rigorous banning of smoking from premises without exemptions' as crucial for policy success.* **Attrition** Not applicable	
Authors *Ratschen et al* **Year** 2009 **Aim of study** *To investigate staff knowledge and attitudes relating to smoking prevalence, dependence, treatment and the relationship between smoking and mental illness.* **Study design** Cross-sectional study **Quality score** ++ **External validity score**	**Country** UK *UK nation not specified.* **Urban/rural setting** Not reported **Secondary Care setting** Mental Health **Source population** Staff *All clinical staff involved in patient treatment and care. n=675; 587 non-medical staff and 88 medical staff.* **Source population demographics** Occupation *Registered nurses, healthcare assistants, occupational and other therapists, psychiatrists (junior doctors and consultants)*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *March 2007* **When assessed** After implementation – single time-point **Where** Mental Health **Smokefree coverage** Smokefree building(s) Smokefree grounds **Supporting strategies/interventions** Staff training **Sample size**	**Primary outcomes** Attitudinal outcomes *Beliefs and attitudes related to the smoke-free policy in wards.* **Follow-up periods** Not applicable **Method of analysis** *Questionnaires were coded, entered and analysed in SPSS version 15 for Windows. Descriptive statistics were used to obtain means, standard deviations (S.D.), medians and proportions. Univariate analyses of categorical and continuous data were performed using chi-squared tests and t*	**Attitudes to smokefree: Staff** *When asked to indicate how important respondents believed it was to address smoking during mental health treatment (on an ascending numerical scale from 1 to 10), the median value ascribed to this was 5, with no significant differences detected between subgroups.* **Beliefs - people's rights: Non-smokers' right to smokefree** *Smokers were less likely to agree that protecting patients and staff from the harmful effects of second-hand smoke through the smoke-free policy was an important aim (59.3% vs. 75.1%, OR=0.48; P=.001).* **Beliefs - effects of smokefree: "Smokefree affects patients' mental health"** *Around two thirds of respondents (64.6%) expressed agreement that smoking*	**Limitations identified by author(s)** *Due to the reasonable overall response rate of the study (68%) and the inclusion of all clinical professions and all psychiatric specialties of a large Trust, the results are likely to be applicable to other mental health inpatient settings. However, although the Trust in question is one of the largest in the country, the generalizability of results to other inpatient settings might be limited due to specific circumstances pertaining to the Trust studied. Furthermore, the response rate from medical staff*

++	*and psychologists.* **Recruitment** *The names of all clinical staff involved in patient treatment and care were obtained from ward managers, and personalized letters inviting participation were issued to all. Questionnaire completion was encouraged by advertising the survey in the internal Trust magazine and intranet and by offering a £5 gift voucher to all respondents. Two follow-up letters were sent to all non-respondents.* **Population selection criteria** Inclusion criteria *All clinical staff involved in patient treatment or care.* Exclusion criteria not reported % participation agreement *68% overall: 70.9% non-medical staff; 44.3% medical staff.* **Potential sources of bias (association)** + **Setting** *25 inpatient mental health units of a UK National Health Service mental health Trust: 12 adult mental health wards, 8 older people's mental health wards, 1 child and adolescent mental health ward, 3 low-secure forensic wards and 1 inpatient drug and alcohol services ward.*	Total sample *n=459: non-medical staff n=416; medical staff n=39.* *64.5% of respondents were female; the mean age was 41.4 years (S.D. 10.9), and the median reported work experience was 11 years. Only six respondents (1.3%) were temporary agency staff, with all others being employed by the local Trust.* *Professional Groups* *Nonmedical staff: Healthcare assistants n=139; Nurses n=218;Occupational therapists n=17; Other n=42* *Medical staff: Consultants n=21; Junior doctors n=18; Not identified n= 4* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable	*tests or, in the case of non normal distribution of data, Mann–Whitney U tests, respectively, to detect differences (taken to be significant at P≤.05) in outcomes between subgroups.*	*constituted an important coping mechanism for patients, although significantly fewer medical staff than nonmedical staff (46.2% vs. 66.3%, OR=0.44; P=.012) did so.* **Planning & resource issues: Staff workload/resourcing** *Approximately half of the respondents (49.7%) agreed that they could make the time to deal with patients' nicotine dependence within their working routine, with smokers being significantly less likely to do so than non-smokers (35.3% vs. 54.6%, OR=0.45; Pb.001).* **Planning & resource issues: Compliance/Enforcement issues** *Less than half of the respondents (42.6%) agreed with the statement that it was their responsibility as a mental health professional to address patients' smoking, with significantly fewer smokers than non-smokers (P=.026; adjusted OR=0.6; 95% CI=0.39–0.94) and significantly fewer staff who had not attended training compared with those who had (P=.01; adjusted OR=0.6; 95% CI=0.41– 0.89) agreeing.* **Other factors: Other** *The median value ascribed to participants' perceived confidence in being able to support inpatient smokers effectively in smoking abstinence was 7 (ascending scale 1-10), again with no significant differences detected between subgroups.* **Attrition** Not applicable	*was lower (44.3%) than average, which may result in responses from this professional subgroup being influenced by self-selection bias to a greater extent than results from nonmedical staff.* *No specific details on the contents of the staff training referred to in the questionnaire were collected, the reason that this factor has been considered secondary in our analysis and the reason that the results relating to it need to be regarded with caution.* **Evidence gaps** *No specific details on the contents of the staff training referred to in the questionnaire were collected, the reason that this factor has been considered secondary in our analysis and the reason that the results relating to it need to be regarded with caution. Further investigation in this area would be useful before conclusions on its impact can be derived.* **Source of funding** Government Other

Authors *Rosen, McCarthy & Moskowitz* **Year** 1996 **Aim of study** *To evaluate a hospital non-smoking policy instituted in a tertiary teaching hospital from the patients' perspective.* **Study design** Cross-sectional study **Quality score** + **External validity score** +	**Country** USA *Massachusetts* **Urban/rural setting** Not reported **Secondary Care setting** Not Mental Health (Acute and/or Maternity) **Source population** Patients *Discharged patients from all service units of the hospital who had stayed at least overnight in the 3-month period* **Source population demographics** None reported **Recruitment** *Letter and survey sent to all patients 1 week after being discharged. Confidentiality assured but not anonymity; survey information merged with medical chart data. Follow-up reminder calls made 2 weeks later.* **Population selection criteria** Inclusion criteria *Discharged patients from all service units of the hospital who had stayed at least overnight in the 3-month period (Jul-May '92)* Exclusion criteria *Serious illness, death, language barriers, unknown/incorrect home address and illiteracy.* % participation agreement	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented Oct '91* **When assessed** After implementation – single time-point *May-Jul '92 (7-9 months post-implementation)* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) Ban exclusions (write in) *Patients who were allowed to smoke for medical reason with the authorisation of a physician's prescription in a designated area outside the hospital.* **Supporting strategies/interventions** Implementation committee Posters/signage *Throughout hospital*	**Primary outcomes** Attitudinal outcomes *Satisfaction with the non-smoking policy; Preferred extent of non-smoking policy; Source of information about policy when hospitalised; Beliefs about the hospital's non-smoking policy (multiple choice answers)* **Follow-up periods** Not applicable **Method of analysis** *Chi-Square test, Fisher's exact test, Student's t-test and analysis of variance used to explore relationships among outcome measure and explanatory variables. Multiple logistic regression techniques used to assess in the individual and joint effects of individual variables. Odds ratios and 95% CI were calculated to determine significance. (Using SAS software, version 5.18)*	**Attitudes to smokefree: Patients** *Satisfaction with the non-smoking policy: When surveyed 1 week after being discharged from hospital, 75% of all patients were satisfied with the non-smoking policy at the hospital, 11% were dissatisfied and 14% were not sure. Sub-group differences: current smokers had the least satisfaction with the policy (55%) and the most dissatisfaction (34%), compared with former smokers (85% satisfied, 3% dissatisfied) and never smokers (72% satisfied, 8% dissatisfied) (Chi-square=56.4, df=12, p<0.0001).* *Preferred policy: When surveyed 1 week after being discharged from hospital, 14% of all patients would prefer tighter restrictions. Sub-group differences: current smokers (15%) were most likely to prefer fewer or no restrictions compared with former smokers (3%) and never smokers (4%) (p<0.0001).* **Communication issues: Availability of information** *Source of information: When surveyed 1 week after being discharged from hospital, most of the patients reported first learning about the non-smoking policy through signs at the hospital (60%), 15% patients reported that their admitting physician or nurse informed them of the policy on admission.* **Communication issues: Patients' familiarity/understanding of policy** *Beliefs about the hospital's non-smoking policy: Patients' knowledge or belief of the policy was assessed by asking respondents to identify rules about smoking in 9 locations in the hospital (patient rooms, cafeteria, patient lounges, restrooms,*	**Limitations identified by author(s)** *Data to verify smoking status was not collected at admission, so all data was self-reported. There was no control hospital to compare outcomes and uncontrolled factors may have influenced results. The response rate achieved allows the possibility of respondent bias. A group of non-responders "may have been too ill 1 week after discharge to follow through in returning the survey" [p.363].* **Limitations identified by review team** *Potential self selection bias; no control group for temporal confounders* **Evidence gaps/future research recommendations** Future research recommendations *Studies that examine a multidimensional approach to smoking cessation intervention will help support and clarify the factors affecting patients' smoking behaviour.* **Source of funding**

	58.5% **Potential sources of bias (association)** + *55.8% response allows possibility of respondent bias. Those who did not respond were less likely to have a smoking-related diagnosis. A group of non-responders "may have been too ill 1 week after discharge to follow through in returning the survey". Explicit incl/excl criteria.* **Setting** *A 379-bed tertiary teaching hospital*	*and at all entrances* Cessation support *Classes on-site for employees* Other (write in) *Articles in hospital newsletter; admitting staff encouraged to inform patients on admission about policy.* **Sample size** Total sample *N=329* *Sample characteristics: mean hospitalisations in past year 2.2 (SD=1.6); mean cigarettes per day 24 (SD=15), mean years smoked 27 (SD=14), mean smokers in house 0.8 (SD=0.9); mean age 58 (SD=16) years; female 48%; white 86%; college/higher education 37%; professional/manager 37%; employed 25%.* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not reported		*hallways or lobbies, nursing stations, examining rooms, and patient-care units). When surveyed 1 week after being discharged from hospital, current smokers (n=63) had significantly higher knowledge of the policy than never smokers (n=102) for all areas except private patient rooms, cafeteria and nursing stations (p<0.05). 58% of all patients answered 7 out of 9 locations correctly.* *When surveyed 1 week after being discharged from hospital, only 8% of all patients correctly answered that 'smoking is always permitted with a physician's prescription' to the question, "To the best of your knowledge, what is the current policy at the University Hospital regarding patient smoking with a physician's prescription?" Smoking status was not related to knowledge (no p value given).* **Attrition** Not applicable	Other
Authors *Sheffer, Stitzer &*	**Country** USA	**Method of allocation** Not applicable	**Primary outcomes** Attitudinal outcomes *Support for smokefree*	**Attitudes to smokefree: Other group(s)** *Results reported as mean (standard deviation)*	**Limitations identified by author(s)** *Subjective views not*

Wheeler **Year** 2009 **Aim of study** *To characterize the perceived concerns and sources of support and resistance reported by the Chief Executive Officers (CEOs) and administrators of Arkansas medical facilities before and after smokefree legislation became effective.* **Study design** Before-and-after study (with same sample after intervention) **Quality score** + **External validity score** +	**Urban/rural setting** Not reported **Secondary Care setting** Both **Source population** *Chief Executive Officers (CEOs) and administrators of Arkansas medical facilities.* **Source population demographics** None reported **Recruitment** *A list of member medical facilities and CEO/administrators was obtained from the Arkansas Hospital Association. Three additional facilities were subsequently identified through contact with hospital CEOs.* **Population selection criteria** Inclusion criteria not applicable Exclusion criteria not applicable % participation agreement *Pre-implementation survey: 87.61%* *Post-implementation survey: 69.02%* **Potential sources of bias (association)** Not reported **Setting** *Arkansas medical facilities. The number of beds at the medical facilities ranged from 0 to 791, with a mean of 132, a median of 77, and a mode of 25. The majority of facilities had no*	**Smokefree implementation stage** Smokefree in place *October 2005* **When assessed** Before implementation – single time-point *April/may 2005* After implementation – single time-point *October 2006* **Where** Both **Smokefree coverage** Smokefree building(s) Smokefree grounds **Supporting strategies/interventions** Other *Smoke-Free Hospital Toolkit comprised of a booklet to guide implementation and a resource CD. Numerous written resources were provided on the CD including administrative and clinical guidelines, examples of policy statements, signage, training activities, and problem-solving.* **Sample size** Total sample	*legislation.* *Support for smokefree legislation anticipated/experienced from: employees; patients; visitors; board; physicians; community?* *Resistance to smokefree legislation anticipated/experienced from employees; patients; visitors; board; physicians; community?* *Greatest challenges pre and post implementation: enforcement/communication.* *Effect on employee performance and retention.* **Follow-up periods** Not applicable **Method of analysis** Method(s) of analysis *Descriptive analyses were conducted on all variables. Progress, agreement, support, and resistance items were analyzed with a paired samples t-tests (alpha < 0.05).*	*Support for smoking ban. Measured on an 11 point-scale (0 = do not agree at all; 11 = total agreement).* *As an employer: Pre-ban 8.78 (2.38); Post-ban 9.22 (1.67)* *As a healthcare provider: Pre-ban 9.41 (1.77); Post-ban 9.80 (0.74)* *As a community member: Pre-ban 9.10 (1.95); Post-ban 9.47 (1.26)* *Support anticipated/experienced from the following people. Measured on an 11 point scale (0=none at al; 11 = the most possible).* *Employees: pre-ban 6.86 (1.84); post-ban 7.68 (1.50)* *Patients: pre-ban 5.96 (2.41); post-ban 6.81 (1.88)* *Visitors: pre-ban 5.66 (2.26); post-ban 6.13 (2.32)* *Board: pre-ban 9.42 (1.14); post-ban 9.84 (0.62)* *Physicians: pre-ban 8.94 (1.50); post-ban 9.54 (0.71)* *Community: pre-ban 7.35 (1.94); post-ban 7.83 (2.10)* *Resistance anticipated/experienced from the following people. Measured on an 11 point scale (0=none at all; 11=the most possible).* *Employees: pre-ban 4.62 (2.42); post-ban 3.64 (2.35)* *Patients: pre-ban 4.61 (2.46); post-ban 4.13 (2.93)* *Visitors: pre-ban 5.41 (2.40); post-ban 4.41 (2.45)* *Board: pre-ban 0.40 (0.83); post-ban 0.02 (0.14)* *Physicians: pre-ban 1.10 (1.37); post-ban 0.73 (1.40)*	*objectively validated by observational or corroborative data.* *Possibility of participation bias.* *Results may not be generalizable to other settings.* **Evidence gaps/future research recommendations** None reported **Source of funding** Not reported

	psychiatric or alcohol and drug beds (n=68; 64.76%), with 27.62% (n=29) maintaining some psychiatric and alcohol and drug beds, and 7.62% (n=8) maintaining only psychiatric and/or alcohol and drug beds. The majority of medical facilities were private non-profit (56.36%), with 26.36% under corporate control, and 17.27% under city, county, state, or federal government control.	*Pre-implementation: 84 hospital CEOs/administrators Post-implementation: 68 hospital CEOs/administrators.* **Baseline comparison** Not reported **Study sufficiently powered? (association)** Not applicable		*Community: pre-ban 2.74 (1.91); post-ban 2.00 (2.10)* **Planning & resource issues: Other planning & resource issues** *Greatest challenges.* *Pre-implementation n=76. Enforcement 55%; communication and/or education 26%.* *Post-implementation n=71. Enforcement 51%; communication and/or education 35%.* **Attrition** Not applicable	
Authors *Shipley & Allcock* **Year** 2008 **Aim of study** *To assess the behaviour of healthcare workers at a busy district general hospital NHS site in North East England in relation to implementation of smoke-free regulations; and to investigate the factors that alter the likelihood of members of staff challenging people seen smoking.* **Study design** Cross-sectional study **Quality score**	**Country** England **Urban/rural setting** Not reported **Secondary Care setting** Not Mental Health (Acute and/or Maternity) **Source population** Staff **Source population demographics** None reported **Recruitment** *Author visited acute medical wards at the Hospital during a 3-day period in March 2007. A questionnaire given to staff working during this time on a convenience basis (direct opportunistic approach). Staff given the questionnaire to complete and place in an envelope or to dispose of it.*	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Implemented 1 Oct '06* **When assessed** After implementation – single time-point *7 months post-implementation (Mar '07)* **Where** Not Mental Health **Smokefree coverage** *"Smoking was banned on Gateshead NHS trust sites" (sites=buildings and grounds?)*	**Primary outcomes** Attitudinal outcomes *Staff asked whether they would challenge a patient, visitor or member of staff smoking on the hospital site in future (only those who had not previously challenged smokers on the site); reasons why they would not challenge staff, patients or visitors to stop smoking.* **Follow-up periods** Not applicable **Method of analysis** *Chi-square test was used to analyse differences between reported behaviours of the subgroups when compared to the average of the study*	**Beliefs - people's rights: Smokers' right to smoke** *Staff asked whether they would challenge a patient, visitor or member of staff smoking on the hospital site in future (only those who had not previously challenged smokers on the site): n=18 (21%) study participants who had not previously challenged smokers on the site reported they would challenge all three groups of smokers (patients, visitors and staff) in the future. The remaining respondents were asked to report why they did not challenge smokers. Thirteen different reasons why staff would not challenge smokers on site were reported, one related to attitude to smokers' rights: respect for autonomy (n=5).* *[Reasons why they would not challenge smokers on site: n=27 fear of aggression; n=12 it was someone else's job; n=11 no reason offered; n=5 smokers should know rules; n=5 won't work; n=5 respect for autonomy; n=4 not bothered; n=4 unknown patient mental state; n=2 unsure of trust policy; n=2 too busy; n=1*	**Limitations identified by author(s)** *Study limited to staff working in one site. The region has above national average smoking rates and high admissions for smoking related illness. Subgroup size limited analysis of differences between subsets of data [by smoking status].* **Limitations identified by review team** *No control group for temporal trends.100% participation, full time acute nursing & medical staff only.* **Evidence gaps** *The difficulties in the enactment of smoke-free regulations on NHS sites* **Source of funding**

+ **External validity score** +	**Population selection criteria** Inclusion criteria *Full-time medical and nursing staff working in acute medicine at the Queen Elizabeth Hospital, Gateshead* Exclusion criteria *Part time, agency and voluntary staff, medical and nursing students and non-nursing staff from professions allied to medicine were excluded* % participation agreement *100% ("No staff declined to participate")* **Potential sources of bias (association)** ++ *100% participation - direct opportunistic approach used to minimise response bias; age and gender distribution approximated to workforce data supplied by hospital; all medical and nursing grades were included in sample* **Setting** *A busy district general hospital NHS site in North East England*	**Supporting strategies/interventions** Revised job description *Described as "all staff have a duty to support a NHS trust's smoke-free status to ensure this environment exists"* **Sample size** Total sample *N=85 hospital staff* *Sample characteristics: n=55 (65%) females; n=49 (58%) medical staff, n=36 (42%) nursing staff; n=12 (14%) smokers, n=12 (14%) ex smokers, n=61 (72%) never smokers; n=41 (48%) aged 25-34 years (sample range 18-65 years)* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not reported	*population. A P-value of <0.05 was accepted to identify key trends in the data.*	*"smoking on site should be allowed"; n=1 fire risk; n=1 legality of smoking ban; n=1 may affect working relationships.]* **Beliefs - effects of smokefree: Other views on smokefree effects** *Staff asked whether they would challenge a patient, visitor or member of staff smoking on the hospital site in future (only those who had not previously challenged smokers on the site): n=18 (21%) study participants who had not previously challenged smokers on the site reported they would challenge all three groups of smokers (patients, visitors and staff) in the future. The remaining respondents were asked to report why they did not challenge smokers. Thirteen different reasons why staff would not challenge smokers on site were reported, two related to beliefs on the effects of smokefree on patients, staff & visitors: fear of aggression (n=27); unknown patient mental state (n=4).* *[Reasons why they would not challenge smokers on site: n=27 fear of aggression; n=12 it was someone else's job; n=11 no reason offered; n=5 smokers should know rules; n=5 won't work; n=5 respect for autonomy; n=4 not bothered; n=4 unknown patient mental state; n=2 unsure of trust policy; n=2 too busy; n=1 "smoking on site should be allowed"; n=1 fire risk; n=1 legality of smoking ban; n=1 may affect working relationships.]* **Planning & resource issues: Staff workload/resourcing** *Staff asked whether they would challenge a patient, visitor or member of staff smoking on the hospital site in future (only those who had not previously challenged smokers on the site): n=18*	Other

				(21%) study participants who had not previously challenged smokers on the site reported they would challenge all three groups of smokers (patients, visitors and staff) in the future. The remaining respondents were asked to report why they did not challenge smokers. Thirteen different reasons why staff would not challenge smokers on site were reported, three related to views on staff resources: it was someone else's job (n=12); too busy (n=2) and may affect working relationships (n=1). *[Reasons why they would not challenge smokers on site: n=27 fear of aggression; n=12 it was someone else's job; n=11 no reason offered; n=5 smokers should know rules; n=5 won't work; n=5 respect for autonomy; n=4 not bothered; n=4 unknown patient mental state; n=2 unsure of trust policy; n=2 too busy; n=1 "smoking on site should be allowed"; n=1 fire risk; n=1 legality of smoking ban; n=1 may affect working relationships.]* **Planning & resource issues: Compliance/Enforcement issues** *Staff asked whether they would challenge a patient, visitor or member of staff smoking on the hospital site in future (only those who had not previously challenged smokers on the site): n=18 (21%) study participants who had not previously challenged smokers on the site reported they would challenge all three groups of smokers (patients, visitors and staff) in the future. The remaining respondents were asked to report why they did not challenge smokers. Thirteen different reasons why staff would not challenge smokers on site were reported, five related to attitudes to smokefree:*	

				smokers should know rules (n=5); won't work (n=5); not bothered (n=4); "smoking on site should be allowed" (n=1); and legality of smoking ban (n=1). *[Reasons why they would not challenge smokers on site: n=27 fear of aggression; n=12 it was someone else's job; n=11 no reason offered; n=5 smokers should know rules; n=5 won't work; n=5 respect for autonomy; n=4 not bothered; n=4 unknown patient mental state; n=2 unsure of trust policy; n=2 too busy; n=1 "smoking on site should be allowed"; n=1 fire risk; n=1 legality of smoking ban; n=1 may affect working relationships.]* **Communication issues: Staffs' familiarity/understanding of policy** *Staff asked whether they would challenge a patient, visitor or member of staff smoking on the hospital site in future (only those who had not previously challenged smokers on the site): n=18 (21%) study participants who had not previously challenged smokers on the site reported they would challenge all three groups of smokers (patients, visitors and staff) in the future. The remaining respondents were asked to report why they did not challenge smokers. Thirteen different reasons why staff would not challenge smokers on site were reported, one related to staff understanding the policy: unsure of trust policy (n=2).* *[Reasons why they would not challenge smokers on site: n=27 fear of aggression; n=12 it was someone else's job; n=11 no reason offered; n=5 smokers should know rules; n=5 won't work; n=5 respect for autonomy; n=4 not bothered; n=4 unknown patient mental state; n=2 unsure of trust policy; n=2 too busy; n=1*	

				"smoking on site should be allowed"; n=1 fire risk; n=1 legality of smoking ban; n=1 may affect working relationships.] **Other factors: Safety issues** *Staff asked whether they would challenge a patient, visitor or member of staff smoking on the hospital site in future (only those who had not previously challenged smokers on the site): n=18 (21%) study participants who had not previously challenged smokers on the site reported they would challenge all three groups of smokers (patients, visitors and staff) in the future. The remaining respondents were asked to report why they did not challenge smokers. Thirteen different reasons why staff would not challenge smokers on site were reported, one related to safety: fire risk (n=1). [Reasons why they would not challenge smokers on site: n=27 fear of aggression; n=12 it was someone else's job; n=11 no reason offered; n=5 smokers should know rules; n=5 won't work; n=5 respect for autonomy; n=4 not bothered; n=4 unknown patient mental state; n=2 unsure of trust policy; n=2 too busy; n=1 "smoking on site should be allowed"; n=1 fire risk; n=1 legality of smoking ban; n=1 may affect working relationships.]* **Attrition** Not applicable	
Authors *Smith and O'Callaghan* **Year** 2008 **Aim of study** *To explore the*	**Country** England **Urban/rural setting** Not reported **Secondary Care setting** Mental Health	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree impending *Due to be implemented July 2008*	**Primary outcomes** *Preferred smoking policy within the Trust.* **Follow-up periods** Not applicable **Method of analysis** *The results were analysed using SPSS*	**Attitudes to smokefree: Patients** *Preferred smoking policy within the Trust: Only 3.0% chose complete ban inside and on premises as their preferred smoking policy, 14.1% supported complete ban inside only, 71.1% supported a general non-smoking policy with designated smoking areas, 7.4% a general smoking*	**Limitations identified by author(s)** *There were some limitations to this study, namely volunteer bias, recall bias and slight environmental differences between wards. The*

smoking habits of in-patients on psychiatric wards, their beliefs about the effects of smoking on health, and their attitudes towards hospital and government smoking policies. **Study design** Cross-sectional study **Quality score** + **External validity score** ++	**Source population** Patients *n=243* **Source population demographics** Health status *in-patients on mental health units* **Recruitment** Recruitment method *Not reported.* **Population selection criteria** Inclusion criteria *All patients* Exclusion criteria *Patients were excluded from participation if their condition was too unstable.* % participation agreement *55.6% overall: 52.6% men; 47.4% women* **Potential sources of bias (association)** ++ **Setting** *Ten general adult and three functional old age wards in Mersey Care NHS Trust: a Trust providing mental health services for Liverpool, Sefton and Kirkby.*	**When assessed** Before implementation – single time-point *April/May 2006. Smokefree not implemented at time of study.* *At the time we surveyed its wards, the Trust had a general non-smoking policy. This entailed one or two smoking rooms on each ward with all other enclosed areas being non-smoking.* **Where** Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/interventions** Not reported **Sample size** Total sample *n=135* *The mean age of interviewees was 49.7 years (s.d.=16.7, range 18-86), with 76.3% aged less than 65 years. A total of 68.1% of the participants were in informal care and 15.6% had been in hospital for at least 6 months.*	*version 14.0 for Windows. Differences between smokers and non-smokers, under 65-year-olds and over 65-year-olds, and those detained and informal were tested with the Pearson chi-squared and Fisher's Exact tests, both two-tailed. Since there was a higher number of smokers among younger patients (w2=14.28, P50.001), results pertaining to age were standardised according to current smoking habits. Ex-smokers were reclassified as non-smokers to reduce the number of analyses.*	*policy with non-smoking areas and 4.4% would like no restrictions on smoking.* **Attrition** Not applicable	*number of hypothesis tests would have increased the likelihood of chance findings. Conversely, the small numbers in some groups may have meant insufficient power to detect additional significant differences. Lastly, ex-smokers were re-classified as non-smokers although these two groups may have had different views.* **Future research recommendations** *It would be interesting to know if these results are mirrored elsewhere in the country and whether patients' views are changing following the implementation of tighter smoking policies within NHS trusts. It would also be worth evaluating the level of compliance with such policies.* **Source of funding** Government

		The overall percentage of current smokers was 54.1%, with 54.8% smoking prior to admission. **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable			
Authors *Steiner* **Year** 1991 **Aim of study** *To describe the process of transforming a psychiatric day hospital into a non-smoking environment by means of a survey of staff and patients in anticipation of, and after the change in policy.* **Study design** Before-and-after study (with same sample after intervention) *Staff sample the same before and after.* Before-and-after study (with different	**Country** USA **Urban/rural setting** Not reported **Secondary Care setting** Mental Health **Source population** Patients *Pre-move: 20 patients* *Post-move: not reported* Staff *17 staff members.* **Source population demographics** None reported **Recruitment** *Both questionnaires distributed to staff and patients at community meetings.* **Population selection criteria** Inclusion criteria *All staff and all patients.* Exclusion criteria not applicable % participation agreement *Pre-move survey: patients 90%;*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *Instituted at the time of the move to a new freestanding facility (June 1990).* **When assessed** Before implementation – single time-point *One week before move to smokefree premises.* After implementation – single time-point *Two weeks after move to new smokefree premises.* **Where** Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/interventio**	**Primary outcomes** Attitudinal outcomes *Whether the smokefree policy was a good or bad idea.* **Follow-up periods** Follow-up period(s) *3 weeks.* **Method of analysis** Not reported	**Attitudes to smokefree: Staff** *Pre-move: All responding staff thought the smokefree policy was a 'good' or 'great' idea, that it would assist smokers to decrease smoking and it would improve the physical environment.* *Post-move: 94% indicated that they felt the policy change had been 'good' or 'great', and 100% thought that the physical environment had improved due to the lack of smoke.* **Attitudes to smokefree: Patients** *Pre-move: Patient opinion was evenly divided on whether the plan was a good or bad idea, and 53% thought it would assist smokers to decrease smoking. 71% of patients thought the physical environment would improve. Three patients expressed angry sentiments.* *Post-move: 67% of responders (which included all the non-smokers) thought that the policy change had been 'good' or 'great'. 86% of respondents felt that there had been an improvement in the physical environment.* **Beliefs - effects of smokefree: "Smokefree affects patients' mental health"**	**Limitations identified by author(s)** None identified by author(s) **Evidence gaps/future research recommendations** None reported **Source of funding** Not reported

sample after intervention) *Some overlap for patient survey before and after (47% of responders post-move survey also responded to first survey).* **Quality score** + **External validity score** +	*staff 88%* *Post-move survey: patients 83%; staff 100%.* **Potential sources of bias (association)** + **Setting** *The Connecticut Mental Health Centre (CMHC) Day Hospital is a short-term programme (30 days) for individuals who are making the transition from an inpatient facility to the community, or whom an 'alternative to hospitalisation' is indicated.*	**ns** *Patients informed of the decision to go smokefree at a community meeting one week beforehand, and were given the opportunity to express their thoughts and feelings about the change.* **Sample size** Total sample *Pre-ban: 17 patients (71% smokers; average habit 1.5 packs/day [range 0.5-3]); 15 staff (20% smokers)* *Post-ban: 15 patients; 17 staff* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable		*Post-move: 33% of staff thought that there had been a negative emotional impact on any of the group ('patients felt angry and left out'). 59% of staff were surprised by the positive response of patients and in particular, the 'lack of complaints'.* *Post-move: 69% of patients thought that there had been a negative emotional impact on some of their fellow patients (e.g. nervousness).* **Attrition** Not applicable	
Authors *Steiner, Weinberger & O'Malley* **Year** 2009 **Aim of study** *A staff survey was conducted to assess attitudes about smoking cessation programs in order to aid policy*	**Country** USA **Urban/rural setting** Not reported **Secondary Care setting** Mental Health **Source population** Staff *n=680* **Source population demographics**	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree impending *April 2008* **When assessed** Before implementation – single time-point *January 2007* **Where**	**Primary outcomes** Attitudinal outcomes *Attitudes toward the statement that entire facility and grounds should be smoke free.* **Follow-up periods** Not applicable **Method of analysis** *Chi square and one-way analysis of variance tests were used to compare*	**Attitudes to smokefree: Staff** *Respondents differed by smoking status in their agreement about whether the entire mental health center campus should become smoke free ($p<.05$). In addition, the overall regression model was significant ($\chi2=14.9$, $df=6$, $p<.05$). When the analysis controlled for age, gender, ethnicity, and job category, smoking status continued to predict attitudes about a smoke-free center. In general, compared with former smokers and current smokers, a larger proportion of*	**Limitations identified by author(s)** None identified by author(s) **Evidence gaps/future research recommendations** None reported **Source of funding** Government

development. **Study design** Cross-sectional study **Quality score** + **External validity score** +	None reported **Recruitment** *The anonymous survey was mailed to a random selection of one third (N=227) of the 680 staff members.* **Population selection criteria** Inclusion criteria not reported Exclusion criteria not reported % participation agreement *87% response rate* **Potential sources of bias (association)** + **Setting** *The Connecticut Mental Health Center is a state owned and state-operated facility with both inpatient and outpatient services, run jointly by the Connecticut Department of Mental Health and Addiction Services and Yale University. It serves individuals from the greater New Haven area who have severe and persistent mental illness, a substance use disorder, or both.*	Mental Health **Smokefree coverage** Smokefree building(s) Smokefree grounds **Supporting strategies/interventions** Not reported **Sample size** Total sample *n=175* *Most survey respondents were women (N=124, 71%) and Caucasian (N=117, 67%), and the mean±SD age of respondents was 42.5±11.8 years. Most respondents had never smoked (N=107, 61%); 14% (N=25) defined themselves as current smokers, and 25% (N=43) defined themselves as former smokers.* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable	*demographic characteristics of respondents in three smoking status groups. Ordinal regression analyses were conducted to examine whether smoking status was a significant predictor of responses to any of the four attitude statements. Age, race, sex, and job category were entered in all regression analyses as covariates.*	*those who had never smoked agreed that the mental health center should be smoke free.* **Attrition** Not applicable	
Authors *Stillman et al* **Year** 1995 **Aim of study**	**Country** USA **Urban/rural setting** Urban **Secondary Care setting**	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place	**Primary outcomes** Attitudinal outcomes *Attitude toward the smoke-free policy* **Follow-up periods**	**Attitudes to smokefree: Patients** *Agreement with the policy: 76.8% patients expressed agreement with the smokefree policy. There were no differences in agreement with the policy based on*	**Limitations identified by author(s)** Identified by author(s) *Substance disorders were excluded and those with*

To examine compliance with a hospital wide no smoking policy and tobacco abstinence rates in a selected group of smoking hospital inpatients. **Study design** Cross sectional study **Quality score** + **External validity score** +	Not Mental Health (Acute and/or Maternity) **Source population** Patients **Source population demographics** Age *Mean age=50.2 years* Sex *57% male* Ethnicity *40% African American* **Recruitment** Recruitment method *Daily computerised search performed of patient admission records and daily patient census. All patients who had identified themselves as smokers at the time of admission were listed, but only patients on the medical and surgical services were eligible to be interviewed. The interview team reviewed charts of patients to determine if they were eligible. Patients were not visited if they were too sick, asleep, or out of their room for procedure.* **Population selection criteria** Inclusion criteria *All inpatients assessed in hospital and recruited for smoking cessation counselling. Patients on the medical and surgical services. All regular smokers (within 1 month of admission), ≤75 years old, fluency in English.* Exclusion criteria *Those diagnosed with a terminal illness; current illicit drug use or*	*Implemented 1990* **When assessed** After implementation – single time-points *At admission (patients admitted 1990-1992)* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/interventions** Written policy(ies) Cessation support *Bedside smoking cessation during patients' forced abstinence* Temporary abstinence support Other *Information about hospital's no smoking policy given to all inpatients at time of admission. Policy also published in the patient handbook. Notes that "no other procedures were instituted to promote compliance" [p.145]* **Sample size** Total sample *n=504 inpatients (who were recruited for smoking cessation counselling)* Sample characteristics: *mean age=50.2 years;*	Not applicable **Method of analysis** Method(s) of analysis *Demographics compared using Students t test for continuous variables, a Chi-square test for categorical and linear trends. Logistic regression analysis was performed to determine predictors of smoking during hospital admission. Odds ratios with 95% CIs were calculated.*	*gender, age or race of the patient.* Sub-group differences: *Patients who remained abstinent during hospitalisation (self report to not smoking even one cigarette) were significantly more likely to have stated agreement with the policy than patients who smoked during hospitalisation (self-report to either leaving the hospital to smoke or being non-compliant with the policy and smoking inside the hospital building) (82% versus 62.5%, p<0.001).* **Attrition** Not applicable	*cardiac problems where over-sampled. CO monitoring may not have been sensitive enough to discriminate abstainers from non abstainers in an inpatient setting – pre-hospital smoking may have affected this especially for those interviewed within 24 hours of admission. Those that carried on smoking minimal amounts may have gone undetected.* **Limitations identified by review team** *That the participants were recruited from a smoking cessation counselling programme* **Future research recommendations** *Indicates more effort is needed to help patients remain abstinent during hospital admission. Understanding the factors that influence patient compliance, identifying characteristics of an inpatient who is less likely to be compliant with non smoking policies.* **Source of funding** Not reported

	alcohol abuse. % participation not reported **Potential sources of bias (association)** + *The participants were selected from a smoking cessation programme.* **Setting** *1000 bed urban teaching hospital in Baltimore, Maryland, USA*	*51% male; 28% African American, "most of the rest were white"; 63% high school graduates; 51% had a cardiac diagnosis; mean length of stay=8.3 days.* **Baseline comparison** No differences btw groups **Study sufficiently powered? (association)** ++			
Authors *Ullen et al* **Year** 2002 **Aim of study** *To explore the impact of the introduction of a smoking ban at the Karolinska Hospital.* **Study design** Cross-sectional study *3 separate cross-sectional studies.* **Quality score** + **External validity score** +	**Country** Sweden **Urban/rural setting** Urban *Stockholm* **Secondary Care setting** Not reported **Source population** Staff **Source population demographics** Occupation *Heads of clinics, all employees, labour managers.* **Recruitment** *Heads of clinical departments: questionnaire survey sent to all heads of department.* *Employees: a random sample of approx. 10% of employees. Individuals sent a questionnaire to their home address.* *Labour managers: convenience sample.*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *From 1st September 1992.* **When assessed** After implementation – multiple time-points *December 1992 (Participants: Heads of clinical Departments)* *March 1993 (Participants: hospital employees)* *March 1995 (Participants: Labour Managers)* **Where** Not reported **Smokefree coverage** Smokefree building(s) **Supporting**	**Primary outcomes** Attitudinal outcomes *Heads of clinical department: their staff's dis/satisfaction with restrictions* *Employees: attitude to smoking restrictions* *Labour managers: opinion of the smokefree workplace* **Follow-up periods** Not applicable **Method of analysis** Not reported	**Attitudes to smokefree: Staff** *Heads of Department reported a third of their staff were satisfied with the smoking restrictions, and the remaining two thirds were of a mixed positive/negative opinion.* *Employee survey: 62% of employees had a positive attitude towards the smoking restrictions. 28% had mixed attitudes. 7% were negative towards the restrictions.* *Approximately 30% said they had changed their opinion to the ban in a positive direction.* **Communication issues: Availability of information** *Heads of department: 98% reported that information prior to the introduction of the ban had been adequate and sufficient.* *Employee survey: 78% of employees 'considered information sufficient and well adjusted'.* **Communication issues: Staffs' familiarity/understanding of policy** *Labour managers survey: All were familiar with existing smoking restrictions.* **Attrition**	**Limitations identified by author(s)** *The questionnaires were not subject to pre-testing in the retrospective target groups, which might have influenced the validity of the results.* *Two parts of the study, heads of clinical departments and labour managers, were small in size.* **Evidence gaps/future research recommendations** None reported **Source of funding** Government

	Population selection criteria Inclusion criteria not reported Exclusion criteria not reported % participation agreement *Heads of clinics: 100%* *Employees: 85%* *Labour managers: 82%* **Potential sources of bias (association)** + **Setting** *Karolinska Hopsital, Sweden. A large University Hospital dedicated to specialist medical care and clinical research. 1,000 beds, 6,000 staff.*	**strategies/interventions** Implementation committee Posters/signage Moved ashtrays/shelters *Ashtrays moves outdoors.* Other (write in) *Employees informed about ban through staff newspaper.* *Patient and visitor information leaflets in Swedish, Finnish, Spanish, Arabic and English.* *'Quit and win' contest for staff.* **Sample size** Total sample *Heads of departments n=41* *Employees n=517 [84% female]* *Labour managers n=17* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not reported		Not applicable	
Authors *Vardavas et al.* **Year** 2009	**Country** Greece **Urban/rural setting** Not reported	**Method of allocation** Investigator did not assign exposure Minimising of confounders not	**Primary outcomes** Attitudinal outcomes *Approval or disapproval of smoke-free hospitals; Change from a complete*	**Attitudes to smokefree: Staff** *Approval or disapproval of smoke-free hospitals: 66% (n=66) of total staff approved of smokefree hospitals, 70.9% (n=39) of all medical/research staff*	**Limitations identified by author(s)** None identified by author(s) **Limitations identified by**

Aim of study *An investigation in a typical large regional hospital in Greece of hospital personnel's perceptions and compliance towards hospital smoking regulations and their current smoking habits.* **Study design** Cross-sectional study **Quality score** - **External validity score** +	**Secondary Care setting** Not Mental Health (Acute and/or Maternity) **Source population** Staff *Medical research staff/doctors and nursing staff* **Source population demographics** Smoking status *Cites previous research in Greece that "the smoking prevalence among hospital staff is estimated at approximately 50%" (p.2)* None reported **Recruitment** *Using the 2006 hospital personnel database, 10% of the permanently employed staff (weighted according to the doctor/nurse ratio) were randomly selected for interview. Participants were repeatedly contacted for interviews.* **Population selection criteria** Inclusion criteria *Permanently employed medical doctors and nurses at the hospital* Exclusion criteria not reported % participation agreement *96%* **Potential sources of bias (association)** + *96% participation (minimal response bias)*	reported **Smokefree implementation stage** Smokefree in place *Aug 02. Although it is noted that, "just as with the majority of relative legislations in Greece it is bluntly ignored by many" (p.1)* **When assessed** After implementation – single time-point *No date* **Where** Not Mental Health **Smokefree coverage** Smokefree building(s) **Supporting strategies/interventions** Not reported **Sample size** Total sample *n=100 staff (n=55 medical research staff/doctors; n=45 nursing staff)* *Sample characteristics: 33.0% males; mean age 39.2 SD 7.4 years; 45.0% smokers, 55.0% ex- and non-smokers; mean 8.0 SD 9.0 years of smoking; 8.9% 1-9 cigarettes/day, 68.9% 10-20 cigarettes/day,*	*to partial smoking ban* **Follow-up periods** Not applicable **Method of analysis** *All p-values from two-sided tests with a significance level of <5%. Continuous variables presented as mean and SD, qualitative variables depicted as frequencies. Student's t-test and a chi-square test used to calculate the distribution of the study group with regard to parameters of occupation, gender, attitudes and level of smoking. Analysis by SPSS 15.0.*	*approved of smokefree hospitals, 60.0% (n=27) of all nursing staff approved of smokefree hospitals. 46.7% (n=21) of total staff smokers approved of smokefree hospitals, 52.6% (n=10) of all medical/research staff smokers approved of smokefree hospitals, 42.3% (n=11) of all nursing staff smokers approved of smokefree hospitals. 81.8% (n=45) of total staff non-smokers (non- and ex-smokers) approved of smokefree hospitals, 80.6% (n=29) of all medical/research staff non-smokers approved of smokefree hospitals, 84.2% (n=16) of all nursing staff non-smokers approved of smokefree hospitals.* *Change from a complete to partial smoking ban: 93.3% of total staff smokers and 96.4% of total staff non-smokers (non- and ex-smokers) responded that they would prefer if the complete smoking ban should change into a partial (with designated smoking and non-smoking areas inside the hospital). No further statistical information is available.* **Attrition** Not applicable	**review team** *Self report smoking, other measures not validated, few p values reported, no control group. Non full-time staff excluded* **Future research recommendations** *"Further research into the factors that modify both personnel smoking habits and the health professionals' beliefs on tobacco related issues is warranted."* **Source of funding** Voluntary/Charity

	Setting *A large regional university hospital which provides primary and secondary care to the population of Heraklion and tertiary care to the population of Crete and the nearby islands.*	*22.2% >20 cigarettes/day; mean 8 SD 11 cigarettes/day.* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not reported			
Authors *Voci et al* **Year** 2010 **Aim of study** *To examine changes over time in degree of staff support for the implementation of a smoke-free policy in Canada's largest public mental health and addiction teaching hospital and to assess the impact of the policy on patient behaviour.* **Study design** Cross-sectional study *Two cross sectional studies.* **Quality score** ++ **External validity score** -	**Country** Canada **Urban/rural setting** Not reported **Secondary Care setting** Mental Health **Source population** Staff *Approximately 2532 staff worked at CAMH at the time of the first survey, and 2770 staff worked at CAMH at the time of the second.* **Source population demographics** None reported **Recruitment** *Staff were sent the first survey via e-mail or inter-office mail, to be completed in pen-and-paper format. The survey was redesigned as an online survey and an e-mail containing a link to the survey was sent to all staff to increase response rate. Recruitment for the second survey was initiated over 2 years post-implementation. All staff*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree in place *September 2005* **When assessed** After implementation – multiple time-points *2-7 months after policy implementation (November 2005-April 2006)* *31-33 months after policy implementation (April- June 2008)* **Where** Mental Health **Smokefree coverage** Smokefree building(s) Smokefree doorways/entrances *The policy prohibits smoking within all CAMH buildings and within a 9-meter radius of any entrance.* **Supporting**	**Primary outcomes** Attitudinal outcomes *The survey assessed attitudes toward and experiences with implementation of the CAMH smoke-free policy.* **Follow-up periods** Not applicable **Method of analysis** *Chi-square tests were computed to compare proportions and independent t-tests were carried out to compare means from the 2005–2006 and 2008 surveys. A paired t-test was performed to compare retrospectively recalled level of support for the policy before it was implemented with current level of support (both reported in 2005–2006). While preliminary data screening revealed that*	**Attitudes to smokefree: Staff** *2005-2006 survey How strongly did you support the smoke-free policy before it was implemented? n=430: 64.0% definitely support; 18.6% support; 9.3% neutral; 5.6% do not support; 2.6% definitely do not support. How strongly do you support the smoke-free policy currently? n=430: 72.6% definitely support; 16.5% support; 4.4% neutral; 2.3% do not support; 4.2% definitely do not support* *2008 survey How strongly do you support the smoke-free policy currently? n=386: 78.2% definitely support; 11.9% support; 5.4% neutral; 2.1% do not support; 2.3% definitely do not support* *In adopting a smoke-free policy, CAMH is following best practices for public health and health prevention (Rating scale: 1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree.) 2005-2006 survey: mean 4.31 (SD 1.17), median 5.00 2008 survey: mean 4.53 (SD 0.94), median 5.00* *Smoke-free facilities are cleaner 2005-2006 survey: mean 4.04 (SD 1.36), median 5.00 2008 survey: mean 4.56 (SD 0.88),*	**Limitations identified by author(s)** *Several limitations of this study are acknowledged. Statistically significant changes in staff attitudes were not large and therefore may not be of clinical or practical significance. Additionally, changes in staff attitudes over time may have been influenced by broader environmental changes. These include enactment of an Ontario-wide smoking ban in all enclosed workplaces and public places (Smoke-Free Ontario Act, May 2006), which may have contributed to a general shift in awareness of the health hazards of second-hand smoke and greater acceptance of bans on indoor smoking. A broader shift in attitudes toward smoking bans may also account for the decreased frequency of staff who*

	were invited to complete the survey, available in both online and paper-and-pen formats. Invitations to complete the survey were distributed via e-mail and through newsletters and advertisements on the CAMH internal website, by way of the CAMH Public Affairs Department. **Population selection criteria** Inclusion criteria (write in) *Inclusion criteria for both surveys were being a current CAMH staff member and being 18 years of age or older. The first survey (2005–2006) also required that respondents had been a staff member at CAMH since the announcement of the policy (August 11, 2005).* Exclusion criteria not applicable % participation agreement *2005/2006 survey: 19.0%* *2008 survey: 18.1%* **Potential sources of bias (association)** - **Setting** *Centre for Addiction and Mental Health (CAMH): 557 beds; provides care to over 20,000 patients annually through approximately 28 inpatient units and over 100 outpatient clinics. CAMH is governed by Ontario's provincial health care system and is a fully affiliated teaching hospital of the University of*	**strategies/interventions** Pharmacotherapies/NRT Staff training **Sample size** Total sample *2005-2006: n=430; Mean age 45.7 (SD 11.1); 79.2% female* *2008: n=400; mean age 44.9 (SD 11.2); 77.3% female* *Further demographic information provided.* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable	*Likert scale ratings were not normally distributed, evidence has shown that t-tests conducted with even modestly large samples (n=80) are robust to deviation from normality, and they were thus deemed appropriate for the current study. We report both medians and means for Likert scale outcome measures.*	*median 5.00* *Moving the smoking off-site or outside is dirtier, uglier 2005-2006 survey: mean 2.64 (SD 1.44), median 3.00 2008 survey: mean 2.35 (SD 1.23), median 2.00* *Staff who were current smokers were more likely to recall having not supported the policy before implementation and were more likely to be unsupportive at both time points post-implementation.* **Beliefs - people's rights: Smokers' right to smoke** *Inpatient clients have a right to smoke (Rating scale: 1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree) 2005-2006 survey: mean 2.84 (SD 1.43), median 3.00 2008 survey: mean 2.99 (SD 1.39), median 3.00* **Beliefs - people's rights: Non-smokers' right to smokefree** *Non-smoking clients have a right to be cared for in a 100% smoke-free facility (Rating scale: 1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree.) 2005-2006 survey: mean 4.71 (SD 0.77), median 5.00 2008 survey: mean 4.77 (SD 0.68) median 5.00* **Beliefs - people's rights: Other rights issues** *Staff have the right to work in a 100% smoke-free facility (Rating scale: 1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree.) 2005-2006 survey: mean 4.76 (SD 0.69), median 5.00 2008*	*allow visitors to smoke in their homes. With the exception of emergency code data, data to assess attitudes and behaviour prior to policy implementation were collected retrospectively and therefore susceptible to recall error. In addition, staff reports of patient behaviour changes are subjective; however, they do reflect staff experience and attitudes and therefore speak to staff support for the policy. Despite being objective, code data may not have been sensitive enough to reveal certain changes in patient behaviour. For example, although code red data revealed no increased incidence in actual fires (as might occur with secretive smoking), it may not have captured the extent to which indoor smoking actually occurred. Furthermore, objective indicators or evidence of change in several other types of patient behaviour was not examined, such as number of prescriptions for NRT, use of PRN medication and number of elopements or discharges against medical advice.*

	Toronto.			*survey: mean 4.79 (SD 0.62), median 5.00* **Beliefs - effects of smokefree: "Smokefree affects patients' mental health"** *Patients are more anxious (Rating scale: 1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree.) 2005/2006 'relative to what I thought would be the case before the smoke-free policy': mean 3.13 (SD 1.13), median 3.00 2005/2006: mean 3.05 (SD 1.20), median 3.00 2008: mean 2.99 (SD 1.11), median 3.00* **Beliefs - effects of smokefree: "Smokefree affects patients' physical health"** *Patients are experiencing more withdrawal symptoms (Rating scale: 1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree.) 2005/2006 'relative to what I thought would be the case before the smoke-free policy': mean 3.15 (SD 1.12), median 3.00 2005/2006 current attitudes: mean 3.01 (SD 1.13), median 3.00 2008: mean 3.33 (SD 1.09), median 3.00* **Beliefs - effects of smokefree: "Smokefree results in changed patient aggression/management issues"** *There is an increased number of physical assault/aggression (Rating scale: 1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree.) 2005/2006 'relative to what I thought would be the case before the smoke-free policy': mean 2.91 (SD 1.03), median 3.00 2005/2006 current: mean 2.58 (SD 1.12), median 3.00 2008: mean 2.69 (SD 0.98), median 3.00*	*Another limitation of the current study is that we did not seek the views of other parties impacted by the policy, most notably patients and individuals of importance to them (e.g., partners, relatives, caregivers, friends), whose views may have deviated from those reported here for staff. Finally, survey response rates were less than 50%, a finding common among surveys of health professionals. As such, survey findings may not be formally representative of the attitudes and beliefs of all staff at CAMH. However, a considerable strength of the current study is that we recruited a large sample of staff across a wide variety of professions and patient care settings. Furthermore, prior studies of this type and formal evaluations of smoke-free policies in similar large psychiatric hospital settings are rare. This lack of empirical data serves to perpetuate a perception that such policy changes would be unacceptable to staff and clients, or ultimately unsuccessful. What this study demonstrates is that even*

				There is an increased number of verbal assault/aggression 2005/2006 'relative to what I thought would be the case before the smoke-free policy': mean 3.13 (SD 1.05), median 3.00 2005/2006 current: mean 2.87 (SD 1.18), median 3.00 2008: data not collected *There is an increased number of physical restraints 2005/2006 'relative to what I thought would be the case before the smoke-free policy': mean 2.83 (SD 1.01), median 3.00 2005/2006 current: mean 2.56 (SD 1.09), median 3.00 2008: mean 2.58 (SD 0.93), median 3.00* *There is an increased number of seclusions 2005/2006 'relative to what I thought would be the case before the smoke-free policy': mean 2.84 (SD 0.95), median 3.00 2005/2006: mean 2.57 (SD 1.02), median 3.00 2008: mean 2.59 (SD 0.92), median 3.00* *There is an increased number of elopements 2005/2006 'relative to what I thought would be the case before the smoke-free policy': mean 2.90 (SD 1.04), median 3.00 2005/2006: mean 2.65 (SD 1.07), median 3.00 2008: mean 2.76 (SD 0.97), median 3.00* **Beliefs - effects of smokefree: "Smokefree results in changed medication issues"** *There is an increase in NRT as a result of smokefree policy (Rating scale: 1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree.) 2005/2006 'relative to what I thought would be the case before the*	*large and complex mental health facilities can establish and persist with a complete indoor ban on smoking.* **Evidence gaps/future research recommendations** None reported **Source of funding** Government

				smoke-free policy': mean 3.56 (SD 0.98), median 3.00 2005/2006 current attitude: mean 3.67 (SD 1.00), median 4.00 2008: mean 3.61 (SD 0.94), median 4.00 *There is an increased use of PRN medications (excluding NRT) 2005/2006 'relative to what I thought would be the case before the smoke-free policy': mean 3.23 (SD 1.00), median 3.00 2005/2006: mean 3.05 (SD 0.99), median 3.00 2008: mean 3.10 (SD 0.86), median 3.00* **Beliefs - effects of smokefree: Other views on smokefree effects** *Clients participate more in recreational activities when in a 100% smoke-free facility (Rating scale: 1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree.) 2005-2006 survey: mean 3.18 (SD 1.10), median 3.00 2008 survey: mean 3.53 (SD 1.03), median 3.00* *There is an increase in discharges against medical advice (Rating scale: 1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree.)* **Planning & resource issues: Staff workload/resourcing** *Staff spend less time monitoring smokers when a facility is 100% smoke-free (1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree.) 2005-2006 survey: mean 2.82 (SD 1.31), median 3.00 2008 survey: mean 3.66 (SD 1.28), median 4.00* *Staff will take fewer smoke breaks in a smoke-free facility*	

				2005-2006 survey: mean 3.11 (SD 1.37), median 3.00 *2008 survey: mean 3.46 (SD 1.35), median 3.50* **Other factors: Safety issues** *There is an increase in calls to security (Rating scale: 1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree.) 2005/2006 'relative to what I thought would be the case before the smoke-free policy': mean 2.94 (SD 1.05), median 3.00 2005/2006 current: mean 2.61 (SD 1.16), median 3.00 2008: mean 2.74 (SD 0.99), median 3.00* **Other factors: Other** *There is an increase in incidences of secretive smoking (Rating scale: 1=strongly disagree; 2=somewhat disagree; 3=neutral; 4=somewhat agree; 5=strongly agree.) 2005/2006 'relative to what I thought would be the case before the smoke-free policy': mean 3.59 (SD 1.20), median 3.00 2005/2006 current: mean 3.66 (SD 1.22), median 4.00 2008: mean 3.50 (SD 1.07), median 3.00* *There is an increase in discharges against medical advice 2005/2006 'relative to what I thought would be the case before the smoke-free policy': mean 2.80 (SD 1.04), median 3.00 2005/2006 current: mean 2.61 (SD 1.01), median 3.00 2008: mean 2.74 (SD 0.90), median 3.00* *There is an increased loss of patient privileges 2005/2006 'relative to what I thought would be the case before the smoke-free policy': mean 2.88 (SD 1.07), median 3.00 2005/2006 current: mean 2.78 (SD 1.10), median 3.00 2008: mean*	

				2.81 (SD 1.04), median 3.00 **Attrition** Not applicable	
Authors *Wheeler et al.* **Year** 2007 **Aim of study** *To measure the impact of the new smoke-free campus policies on employees and patients at the two institutions on the hospital campus.* **Study design** Before-and-after study (with different sample after intervention) Cross-sectional study *Site 2 questionnaire (staff)* **Quality score** - **External validity score** +	**Country** USA *Arkansas* **Urban/rural setting** Not reported **Secondary Care setting** Not Mental Health (Acute and/or Maternity) **Source population** Patients Staff **Source population demographics** Smoking status *Staff: convenience data collected for 2706/8484 (31.9%) current employees (site 1) by the occupational health office showed a 16.4% rate of smoking on 1st Jul 04 (3 days pre-implementation).* **Recruitment** *Questionnaire site 1 (staff): staff roster from HR Dept. used to randomly sample 1,400 from ~9,000 employees without replacement* **Population selection criteria** Inclusion criteria *Questionnaire site 1 (staff): university and hospital and faculty staff* Exclusion criteria not reported *Questionnaire site 1 (staff)*	**Method of allocation** Investigator did not assign exposure Minimising of confounders not reported **Smokefree implementation stage** Smokefree in place *Site 1: announced 29th Oct 03, implemented 4th Jul 04; Site 2: announced Spring 04, implemented 6 months later (employees) and Spring 05 (12 months later) (employees, visitors, patients)* **When assessed** Before implementation – single time-point *Site 1: Apr 04 (questionnaire).Site 2: 2 months after employee only ban (= 4 months pre-full smokefree) (questionnaire).* After implementation – single time-point *Site 1: May 05 (questionnaire).* **Where** Not Mental Health	**Primary outcomes** Attitudinal outcomes *Site 1 (staff only): support for the policy; the policy will make/makes the site healthier and safer; the policy will set/sets a good example for patients* **Follow-up periods** Follow-up period(s) *13 months (questionnaire, site 1 only).* **Method of analysis** *Descriptive statistical methods of analyses included proportions and their standard errors. Rao-Scott Chi-square tests for independence (a design-adjusted version of the Pearson Chi-square test) were applied to compare the equality in proportions before and after policy implementation. Fisher's exact test was applied in instances where Chi-square cell expectancy assumptions were not met.*	**Attitudes to smokefree: Staff** *Site 1:* *Support for the policy: Between April 2004 (pre-implementation) and May 2005 (post-implementation), there was a significant increase in staff support for the ban (83.3% to 89.8%, p<0.001). Results in favour of smokefree.* *Before the ban, 87.8% employees felt the policy would make hospital healthier and safer (87.8%), and following the ban, this attitude became significantly more prevalent (92.3%; p=0.0001).* *Before the ban, (87.2%) employees believed the policy would set a good example for patients (87.2%), and this belief significantly intensified afterward (91.6%; p=0.001).* *Site 2:* *Support for the policy was high (87.8%). Employees felt the policy would make hospital healthier and safer (89.4%). Employees believed the policy would set a good example for patients (85.1%).* **Attrition** Not applicable	**Limitations identified by author(s)** *Study restricted to two hospital campuses and not all outcomes were measured on both campuses. Efforts to enrol other regional hospitals were limited by the hesitancy of institutions to commit to smoke-free and concerns about sharing proprietary information about employment statistics.* **Limitations identified by review team** *Limited reporting as many measures/parts to the study; self-selection bias; no control group* **Evidence gaps** *"Reasons that hospitals have not volunteered to go smoke-free have not been carefully studied"* **Source of funding** Government Voluntary/Charity

	% participation agreement *60.1% (pre-implementation), 65.1% (post-implementation) for Questionnaire site 1* **Potential sources of bias (association)** + *Staff survey used HR roster to randomly sample 1,400 from ~9,000 employees without replacement, weighted by gender and age groups for representative estimates of employee population. 60.1% (pre-), 65.1% (post-) participation. No demographics for non-responders.* **Setting** *Two sites: 1) Arkansas's university hospital and academic medical center and 2) a smaller, private children's hospital that uses the university's faculty and residents for its medical staff.*	**Smokefree coverage** Smokefree building(s) Smokefree vehicles Smokefree grounds Other *All property owned or leased.* **Supporting strategies/interventions** Written policy(ies) Implementation committee Posters/signage Staff meetings Staff letters/payslip notes Patient appointment letters Cessation support Pharmacotherapies/NRT *Site 1: free to employees for 6m (Apr-Sep 04), on sale on campus to non-employees. Site 2: free to employees (open-ended), n sale on campus to non-employees.* Other *Staff appointed (site 1: wellness director, site 2: tobacco control specialist with cessation expertise); Site 1: portable pagers*			

		in emergency dept. for patrons/visitors who needed to leave campus to smoke; Scripts for staff to deal with patrons smoking; Staff violations dealt with by HR dept.; Written policy in new employees packs; Neighbouring businesses notified; Announcements in local media. **Sample size** Total sample *Questionnaire site 1 (staff): n=842 (pre-implementation), n=912 (post-implementation)* *Sample characteristics: occupation distribution changed significantly due to a change in nurse respondents from 19% (pre-) to 11% (post-) (p<0.0001) and education distribution changed significantly due to decreases in 'high school or less' and 'college graduate' and an increases in 'professional or post-college education' (p=0.015). Gender (p=0.8964), age and race distributions did not change*			

		significantly between measures. *Questionnaire site 2 (staff): n=183* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not reported			
Authors *Wye et al* **Year** 2010 **Aim of study** *This study aimed to examine the views of psychiatric inpatient hospital staff regarding the perceived benefits of and barriers to implementation of a successful total smoking ban in mental health services. Secondly, to examine the level of support among clinical and non-clinical staff for a total smoking ban. Thirdly, to examine the association between the benefits and barriers perceived by clinicians and their*	**Country** Australia **Urban/rural setting** Not reported **Secondary Care setting** Mental Health **Source population** Staff *n=300* **Source population demographics** Occupation *60% (approximately 180 staff) occupied clinical positions that is, performed a role that involved patient care. The remainder occupied non-clinical positions (for example, administrative and support staff).* **Recruitment** Recruitment method *All staff were invited by management email and staff newsletter to complete a pen and paper questionnaire during the two week survey period. Although completion of the*	**Method of allocation** Not applicable **Smokefree implementation stage** Smokefree impending *Due to be implemented 2 weeks immediately following the survey period.* **When assessed** Before implementation – single time-point **Where** Mental Health **Smokefree coverage** Smokefree building(s) Smokefree grounds **Supporting strategies/interventions** Implementation committee Posters/signage Cessation support Removal	**Primary outcomes** Attitudinal outcomes *Perceived benefits of a total smoking ban* *Clinician perceived barriers to implementation of a total smoking ban* *Support for a total smoking ban* **Follow-up periods** Not applicable **Method of analysis** *All analyses were undertaken using SPSS Version 15. Descriptive statistics were used to report respondent demographics, perceived benefits of, and barriers to a total smoking ban, and support for a total smoking ban.* *Response categories for staff perceived benefits and barriers were reduced to three: 'agree, uncertain, disagree'. Response categories for*	**Attitudes to smokefree: Staff** *Do you support the statement that smoking should be totally banned throughout the Area's mental health services?: 7% strongly unsupportive; 14% unsupportive; 12% no view either way; 33% supportive; 34% strongly supportive* *Do you agree with the statement that smoking should be totally banned on the unit? (clinical staff only): 7% strongly disagree; 19% disagree; 19% unsure; 22% agree; 32% strongly agree* *Total smoking ban makes the place look/smell better: 81% agree; 11 uncertain; 8% agree* **Beliefs - effects of smokefree: "Smokefree affects patients' mental health"** *Total smoking ban will improve patient mental health: 29% agree; 37% uncertain; 34% disagree* *Total smoking ban will make patients happier: 5% agree; 35% uncertain; 59% disagree* **Beliefs - effects of smokefree: "Smokefree affects patients' physical**	**Limitations identified by author(s)** *The findings of the present study need to be considered in the context of a number of its methodological characteristics. First, although comparable to previous studies the response rates, particularly for clinical staff, suggest that the results may not be representative of all staff. The extent to which the observed results reflect either an under or overestimate of the views of all staff is not known. Second, as the study was conducted in a single health service, the findings may not be generalizable to mental health services either elsewhere in the state or more broadly.* **Limitations identified by**

support for a total smoking ban in their unit. **Study design** Cross-sectional study *Separate surveys for clinical and non-clinical staff* **Quality score** ++ **External validity score** ++	*questionnaire was voluntary, staff were encouraged to complete the questionnaire by management, and several prompts through emails and newsletters were provided.* **Population selection criteria** Inclusion criteria (write in) *All staff, clinical and non-clinical.* Exclusion criteria not reported % participation agreement *61%: clinical staff 41%; non-clinical staff 92%.* **Potential sources of bias (association)** + **Setting** *A large psychiatric inpatient hospital in the state of New South Wales. The facility had approximately 2000 patient discharges per annum, consisting of 80 beds in six units: a psychiatric emergency centre, an intensive care unit, two general acute units, a dual diagnoses (concurrent mental health and substance use) unit, and an aged care unit.*	ashtrays/shelters Staff training Other (write in) *Allocation of resources to the implementation of the policy; communication to staff and the community regarding the introduction of the policy; creation of a mental health implementation project officer position for twelve months;* **Sample size** Total sample *n=183: clinical staff 73; non-clinical staff 110* *66% female* *44% under 35 years; 21% 36-45 years; 35% 45+ years* *21% current smokers; 26% former smokers; 52% never smokers* **Baseline comparison** Not applicable **Study sufficiently powered? (association)** Not applicable	*clinician and non-clinician support for a ban in mental health services generally were reduced to two: 'strongly unsupportive/unsupportive/ no view either way'; and 'supportive/strongly supportive'. Response categories relating to clinician support for a ban in their unit were reduced to two: 'strongly disagree/disagree/unsure'; and 'agree/strongly agree'. Possible differences between clinical and non-clinical staff in their perceptions of the benefits of a total smoking ban, and in their support for such a ban in mental health services generally were assessed by chi square analyses. Chi square analysis was initially undertaken to determine the univariate associations between staff demographic characteristics and clinical staff perceptions of the benefits and barriers of a total smoking ban, and their support for such a ban. Multiple statistical testing was accounted for by setting the*	**health"** *Total smoking ban will improve patient physical health: 65% agree; 23% uncertain; 12% disagree* **Beliefs - effects of smokefree: "Smokefree results in changed patient aggression/management issues"** *Total smoking ban will decrease client aggression: 8% agree; 31% uncertain; 60% disagree* *Clinician perceived barriers to a successful total smoking ban: Fear of patient aggression: 89% agree; 4% uncertain; 7% disagree* **Beliefs - effects of smokefree: "Smokefree results in changed medication issues"** *Total smoking ban will reduce medication use (clinical staff only): 17% agree; 28% uncertain; 56% disagree* **Beliefs - effects of smokefree: "Smokefree affects staff"** *Total smoking ban helps staff stop smoking: 66% agree; 23% uncertain; 11% disagree* **Beliefs - effects of smokefree: Other views on smokefree effects** *Total smoking ban will improve working conditions: 64% agree; 20% uncertain; 15% disagree* *Total smoking ban will improve patient quality of life: 40% agree; 38% uncertain; 21% disagree* *Total smoking ban will help patients stop*	**review team** **Evidence gaps/future research recommendations** Future research recommendations *Although this was a study of staff views, further research is required to ascertain patient views towards total smoking bans.* **Source of funding** Government

			significance level to p < 0.01. Perceived benefits and barriers that had the strongest relationship with support for a total smoking ban were entered into a backward stepwise logistic regression model. The number of variables initially entered into the model was limited by the size of the sample. The final model contained all variables with p < 0.05.	*smoking: 38% agree; 29% uncertain; 33% disagree* *Total smoking ban will increase the quality of care: 31% agree; 48% uncertain; 21% disagree* *Total smoking ban will increase rapport between patients (clinical staff only): 11% agree; 37% uncertain; 51% disagree* **Planning & resource issues: Staff workload/resourcing** *Total smoking ban will create less work: 12% agree; 37% uncertain; 51% disagree* *Clinician perceived barriers to a successful total smoking ban: staff are too busy with patient mental health: 61% agree; 15% uncertain; 24% disagree* *Clinician perceived barriers to a successful total smoking ban: Lack of staff time: 57% agree; 21% uncertain; 22% disagree* *Clinician perceived barriers to a successful total smoking ban: Lack of resources: 35% agree; 42% uncertain; 23% disagree* **Planning & resource issues: Staff training** *Clinician perceived barriers to a successful total smoking ban: patients will continue to smoke: Lack of staff knowledge: 52% agree; 16% uncertain; 32% disagree* *Clinician perceived barriers to a successful total smoking ban: Lack of staff skills: 43% agree; 14% uncertain; 43% disagree* *Clinician perceived barriers to a successful total smoking ban: Insufficient staff*	

				training provided: 40% agree; 29% uncertain; 31% disagree **Planning & resource issues: Planning/Timing-specific issues** *Clinician perceived barriers to a successful total smoking ban: processes aren't developed: 44% agree; 37% uncertain; 19% disagree* *Clinician perceived barriers to a successful total smoking ban: support systems aren't in place: 44% agree; 36% uncertain; 19% disagree* **Planning & resource issues: Structural issues** *Clinician perceived barriers to a successful total smoking ban: Lack of sustainability: 32% agree; 32% uncertain; 36% disagree* *Clinician perceived barriers to a successful total smoking ban: Lack of management support: 29% agree; 25% uncertain; 46% disagree* **Planning & resource issues: Compliance/Enforcement issues** *Clinician perceived barriers to a successful total smoking ban: patients will continue to smoke: Lack of staff cohesion/consistency: 59% agree; 24% uncertain; 17% disagree* *Clinician perceived barriers to a successful total smoking ban: patients will continue to smoke: Lack of staff confidence: 53% agree; 21% uncertain; 26% disagree* *Clinician perceived barriers to a successful total smoking ban: Staff resistance to change: 58% agree; 22% uncertain; 20%*	

				disagree *Clinician perceived barriers to a successful total smoking ban: Lack of staff interest: 36% agree; 26% uncertain; 38% disagree* *Clinician perceived barriers to a successful total smoking ban: Lack of staff commitment: 26% agree; 38% uncertain; 36% disagree* **Communication issues: Availability of information** *Clinician perceived barriers to a successful total smoking ban: lack of information about policy/procedures: 49% agree; 21% uncertain; 30% disagree* **Other factors: Safety issues** *Total smoking ban will make the unit safer: 26% agree; 36% uncertain; 37% disagree* **Other factors: Other** *Clinician perceived barriers to a successful total smoking ban: patients will continue to smoke: 72% agree; 14% uncertain; 14% disagree* *Clinician perceived barriers to a successful total smoking ban: staff will continue to smoke: 51% agree; 24% uncertain; 25% disagree* **Attrition** Not applicable	