YHEC

York Health Economics Consortium

Providing consultancy and research in health economics for the NHS, pharmaceutical and health care industries since 1986

NICE

Review of Systematic Reviews Exploring the Implementation/Uptake of Guidelines

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INVESTORS IN PEOPLE

Contents

Glossary

CDSR	Cochrane Database of Systematic Reviews
COPD	Chronic obstructive pulmonary disease
DARE	Database of Abstracts of Reviews of Effects
DH	Department of Health
ED	Emergency department
GIN	Global International Network
GP	General Practitioner
NICE	National Institute for Health and Care Excellence
NR	Not reported
OECD	Organisation for Economic Co-operation and Development
PHAC	Public Health Advisory Committee
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RCT	Randomised controlled trial
YHEC	York Health Economics Consortium

Executive Summary

1. INTRODUCTION

The National Institute for Health and Care Excellence (NICE) has been asked by the Department of Health to develop guidance to help safely implement existing evidence-based recommendations on the prevention of vitamin D deficiency. To inform this process, NICE has commissioned York Health Economics Consortium (YHEC) to produce a rapid pragmatic overview of systematic reviews exploring the implementation or uptake of any guidelines.

2. METHODS

This overview of systematic reviews aimed to summarise the findings of systematic reviews exploring the implementation or uptake of guidelines, in relation to three questions. The research questions were:

1. What is the effectiveness of strategies used to promote guideline uptake?
2. What are the factors influencing implementation of guidelines?
3. What are the barriers to implementation of guidelines?

Four key resources which provide access to systematic reviews, including the Cochrane Library, were searched to identify systematic reviews. The reviews identified were summarised and their quality was assessed using the AMSTAR checklist.

3. RESULTS

Fifteen systematic reviews, including two overviews of systematic reviews, were identified.

The terminology used in the evidence statements is the wording used by the review authors:

- 'inconclusive' means that a conclusion could not be reached.
- 'ineffective' means that the intervention had either no effect, or a negative effect.

There was very little data available on effect size. We have reported all instances where the reviews reported effect sizes.

Where an overview of systematic reviews is reported in an evidence summary, it is always presented first.

1. What is the effectiveness of strategies used to promote guideline uptake?

Eleven systematic reviews assessing intervention strategies to promote guideline uptake were identified. Most included randomised controlled trials (RCTs) and cluster RCTs and, to a lesser extent, other study designs such as before-and-after studies and time series. Two reviews were overviews of systematic reviews. Overlap between the primary studies included in the systematic reviews was not investigated. The majority of included reviews evaluated the use of multifaceted interventions, followed by audit and feedback strategies.

The included systematic reviews were generally of poor methodological quality; only one was assessed as being of moderate quality, meeting more than half of the 11 AMSTAR criteria. Lack of reporting was an issue for all included reviews.

2.1 Evidence statement: Mailed dissemination for guideline implementation

There is mixed evidence from four reviews on the effectiveness of mailed dissemination for improving guideline uptake.[1,2,3,4.] There is some evidence from two reviews that mailed dissemination is effective[2,3] and evidence from one review that mailed dissemination if ineffective.[1.] One review reported inconclusive results.[4]

[1] Brusamento *et al.,* 2012
[2] Grimshaw *et al.,* 2004
[3] Medves *et al.,* 2010
[4] Prior *et al.,* 2008

2.2 Evidence statement: Computerised decision systems for guideline implementation

There is strong evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] that computerised decision systems are effective in increasing guideline uptake. However, there is evidence from one review that computerised decision systems are ineffective compared with usual care or paper based systems.[4]

[1] Prior *et al.,* 2008
[2] Okelo *et al.,* 2013
[3] Brusamento *et al.,* 2012
[4] Heselmans *et al.,* 2009

2.3 Evidence statement: Educational meetings for guideline implementation

There is mixed evidence from four systematic reviews[1,2,3,4] on the effectiveness of educational meetings for increasing guideline uptake. Two reviews reported improvements in guideline uptake following educational meetings; one review found that the inclusion of nurse case management to educational workshops to promote guideline uptake resulted in improvements in patient outcomes[1], while the other review reported the majority of included studies (74%) reported positive findings[4]. Two reviews did not find evidence of effectiveness on professional practice outcomes.[2,3.]

[1] Lineker and Husted, 2010
[2] van der Wees *et al.,* 2008
[3] Grimshaw *et al.,* 2004
[4] Medves *et al.,* 2010

2.4 Evidence statement: Continuing education for guideline implementation

There is mixed evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] on the effectiveness of continuing education for increasing guideline uptake. All included overviews and systematic reviews reported mixed findings with both effective and ineffective results. All reviews were of poor quality and the components of continuing education were poorly described.

[1] Prior *et al.,* 2008

[2] Chaillet *et al.,* 2006
[3] Brusamento *et al.,* 2012

2.5 Evidence statement: Educational outreach visits for guideline implementation

There is strong evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] about the effectiveness of educational outreach visits for increasing guideline uptake. An overview of systematic reviews reported positive findings for practice visits by educators, the provision of promotional material, and subsequent reminders or educational follow-up.[1] One review shows that educational outreach visits delivered by pharmacists reduced inappropriate prescribing[2] and the other review reported that healthcare visits from outside an organisation were beneficial in providing education to healthcare professionals.[3]

[1] Prior *et al.,* 2008
[2] Lineker and Husted, 2010
[3] Medves *et al.,* 2010

2.6 Evidence statement: Audit and feedback for guideline implementation

There is moderate evidence from one overview of systematic reviews[1] and moderate evidence from six systematic reviews[2,3,4,5,6,7] about the effectiveness of audit and feedback for increasing guideline uptake. An overview of systematic reviews reported moderate evidence of effectiveness of audit and feedback; eight of 18 included systematic reviews reported positive findings, while ten reported unclear findings. Four reviews reported moderate evidence that audit and feedback were effective[2,4,6,7] with the majority of included studies reporting positive findings. Two reviews (identifying one RCT each) reported no evidence that audit and feedback were effective.[3,5.]

[1] Prior *et al.,* 2008
[2] Chaillet *et al.,* 2006
[3] Lineker and Husted, 2010
[4] Okelo *et al.,* 2013
[5] Brusamento *et al.,* 2012
[6] Grimshaw *et al.,* 2004
[7] Medves *et al.,* 2010

2.7 Evidence statement: Opinion leaders for guideline implementation

There is mixed evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] on the effectiveness of opinion leaders for increasing guideline uptake. All included overviews and systematic reviews reported mixed findings with both effective and ineffective results. All reviews were of poor quality.

[1] Prior *et al.,* 2008
[2] Chaillet *et al.,* 2006
[3] Medves *et al.,* 2010

2.8 Evidence statement: Patient mediated strategies for guideline implementation

There is mixed evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] on the effectiveness of patient mediated strategies for increasing guideline uptake where patient-mediated strategies were defined as new clinical information (not previously available) which was collected directly from patients and given to the provider. An overview of systematic reviews reported mixed findings with five included reviews reporting positive findings and four reviews reporting inconclusive findings.[1] In this overview of reviews, patient-mediated strategies were defined as interventions designed to influence practitioner behaviour via information provided to patients. Two reviews reported that the majority of their included studies showed benefits in employing patient mediated strategies for guideline uptake; however all included reviews were of poor quality and in most cases the components of the patient mediated strategies were not reported.[2,3.]

[1] Prior *et al.,* 2008
[2] Grimshaw *et al.,* 2004
[3] Medves *et al.,* 2010

2.9 Evidence statement: Reminders for guideline implementation

There is moderate evidence from one overview of systematic reviews[1] and three systematic reviews[2,3,4] on the effectiveness of reminders for increasing guideline uptake. An overview of systematic reviews reported that 75% of included reviews showed positive findings.[1.] Three further systematic reviews support this finding.[2,3,4.] Reminders were provided verbally, on paper or on a computer screen.

[1] Prior *et al.,* 2008
[2] Chaillet *et al.,* 2006
[3] Grimshaw *et al.,* 2004
[4] Medves *et al.,* 2010

2.10 Evidence statement: Multifaceted interventions for guideline implementation

There is moderate evidence from two overviews of systematic reviews[1,2] and six systematic reviews[3,4,5,6,7,8] on the effectiveness of multifaceted interventions for increasing guideline uptake. The overviews reported that a combined total of 18 of the 22 included studies showed that multifaceted and intensive strategies were more effective than single interventions[1,2.]

There is mixed evidence from six systematic reviews about the effectiveness of multifaceted interventions; each primary study within the reviews used a different number and type of intervention components so it is not possible to report which components are most effective in combination. Four systematic reviews reported improvements in guideline uptake using multifaceted interventions[3,4,5,6]; one review reported mixed findings[7] and one review reported ineffective findings.[8]

[1] Prior *et al.,* 2008
[2] Francke *et al.,* 2008
[3] Chaillet *et al.,* 2006
[4] Okelo *et al.,* 2013
[5] Simpson *et al.,* 2005
[6] van der Wees *et al.,* 2008
[7] Brusamento *et al.,* 2012
[8] Grimshaw *et al.,* 2004

2.11 Evidence statement: Organisational change for guideline implementation

There is limited evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] regarding the effectiveness of organisational change. No review suggested that organisational change was an effective intervention to increase guideline uptake.

[1] Prior *et al.,* 2008
[2] Okelo *et al.,* 2013
[3] Medves *et al.,* 2010

2. What are the factors influencing implementation of guidelines?

Four systematic reviews explored factors influencing the implementation of guidelines. One review also considered barriers within their investigation of environmental characteristics thought to influence implementation. One included a variety of study designs, one included studies using focus groups and interviews, and one was an overview of systematic reviews and the fourth reported on models identified from studies. The majority of included reviews did not have an intervention or comparator but aimed to identify the factors that influenced guideline implementation, and were targeted at healthcare professions. The included systematic reviews were of poor methodological quality, mainly due to a lack of reporting which was an issue for all included reviews.

2.12 Evidence statement: Characteristics of guidelines thought to influence implementation

There is limited evidence from one overview of systematic reviews[1] and three systematic reviews[2,3,4] regarding characteristics of guidelines thought to influence implementation. Complexity, user unfriendliness, limited accessibility, trialability[*], discordance between guidelines, and lack of local ownership were suggested as barriers to implementation.[5,3,2] An overview of systematic reviews also reported that guidelines that do not require specific resources have a greater chance of implementation.[1]

[1] Francke *et al.,* 2008
[2] Gurses *et al.,* 2010
[3] Simpson *et al.,* 2005
[4] Cochrane *et al.,* 2007
[5] Okelo *et al.,* 2013

**Trialability was defined in terms of a question: Can the clinician test or try this guideline with relative ease? (Gurses 2010)

2.13 Evidence statement: Characteristics of professionals thought to influence implementation

There is limited evidence from one overview of systematic reviews[1] and three systematic reviews[2,3,4] regarding characteristics of professionals thought to influence implementation. Lack of physician awareness of, or agreement with guidelines, conservative attitude, and greater experience of treating community acquired pneumonia and legal concerns were thought to be barriers to implementation.[2,3,4,1.]

[1] Francke *et al.,* 2008
[2] Simpson *et al.,* 2005
[3] Gurses *et al.,* 2010
[4] Cochrane *et al.,* 2007

2.14 Evidence statement: Characteristics of patients thought to influence implementation

There is limited evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] regarding characteristics of patients thought to influence implementation. Overall, patient attitudes, knowledge, or behaviours (such as adherence) were all thought to influence implementation. These reviews also suggested that co-morbidities reduced the chance that guidelines are followed.[2,3,1.]

[1] Francke *et al.,* 2008
[2] Simpson *et al.,* 2005
[3] Cochrane *et al.,* 2007

2.15 Evidence statement: Characteristics of the environment thought to influence implementation

There is limited evidence from one overview of systematic reviews[1] and one systematic review[2,] regarding characteristics of the environment thought to influence implementation. The overview of systematic reviews suggested that lack of support from peers or superiors as well as insufficient staff and time were the main barriers to implementation[1], while the additional systematic review suggested that limited time, personnel and resources devoted to support guideline adherence and high workload were barriers.[2]

[1] Francke *et al.,* 2008
[2] Simpson *et al.,* 2005

3. What are the barriers to implementation of guidelines?

Two poor quality systematic reviews explored barriers or factors to guideline adherence or implementation. One review included studies based on surveys, focus groups, interviews and mixed methods, and the other reported on models identified from studies.

One review identified barriers to be lack of knowledge, awareness or skill (65 studies); lack of professional efficacy, authority, outcome expectancy or accurate self-assessment (58 studies); lack of material support, resources, funding, or time (69 studies); and lack of organisational, system, referral, work or team structures, or processes (62 studies). A second review suggested factors that affect clinicians' compliance with evidence-based guidelines could include task, physical environment and organisational characteristics and tools/technologies.

2.16 Evidence statement: Barriers to implementation

There is limited evidence from two systematic reviews[1,2] regarding barriers to implementation. One review suggested that system characteristics such as the physical environment and organizational characteristics were barriers to implementation.[1]. The other review reported that lack of knowledge, awareness or skill, personal efficacy and lack of resources were barriers to implementation.[2]

[1] Gurses *et al.,* 2010
[2] Cochrane *et al.,* 2007

4. DISCUSSION

The majority of the fifteen reviews from this pragmatic review of reviews were of poor methodological quality. One overview concluded that there was convincing evidence for the use of multifaceted interventions (involving strategies such as educational strategies, audit and feedback, opinion leaders, quality improvement strategies, academic detailing, reminders), interactive education and clinical reminder systems for effective implementation of clinical guidelines(15), while the other overview concluded that multiple strategies appear to be more effective than single interventions in implementing guidelines.(18) Both overviews mentioned the lack of good quality evidence about guideline implementation.

A range of characteristics of guidelines, health care professionals and the working environment were suggested to influence implementation negatively but only low-resource requirements was identified as potentially enhancing implementation. Complexity, user unfriendliness, limited accessibility, trialability, discordance between guidelines, and lack of local ownership were suggested as barriers to implementation. Lack of physician awareness of guidelines or agreement with guidelines, a conservative attitude, and greater experience of treating community acquired pneumonia and legal concerns were thought to be barriers to implementation. Patients' attitudes, knowledge, or behaviours such as adherence were all thought to influence implementation. These reviews also suggested that co-morbidities reduced the chance that guidelines are followed.

The included reviews generally agreed that there were too few rigorous studies assessing the effectiveness of different approaches to implementing clinical guidelines and that better quality studies should be conducted. Some authors reported that there was a need to understand better the active components of interventions and how they were contributing to guideline uptake.

Section 1: Introduction

1.1 BACKGROUND

The National Institute for Health and Care Excellence (NICE) has been asked by the Department of Health (DH) to develop guidance to help safely implement existing evidence-based recommendations on the prevention of vitamin D deficiency. NICE contracted York Health Economics Consortium (YHEC) to undertake evidence reviews and economic modeling for this work. NICE have since contracted YHEC to produce this additional rapid overview of systematic reviews exploring the implementation or uptake of any guidelines.

1.2 OBJECTIVES

The objective of this review was to prepare a non-exhaustive, high-level summary of the findings of systematic reviews that have explored the implementation/uptake of guidelines. This was intended to be a pragmatic high-level overview of reviews with clear acknowledgement of the limitations of the approach adopted. Specifically, YHEC sought to:

- Identify recent systematic reviews that have investigated the implementation/uptake of guidelines;
- Summarise the data and conclusions from those systematic reviews;
- Provide quality assessments of each review using the AMSTAR checklist;
- Produce a report providing a brief overview of the summarised data, the limitations and evidence gaps from the reviews identified, and a description of the limitations of this review;
- Develop a PowerPoint presentation for the Public Health Advisory Committee (PHAC) meeting in February 2014.

Section 2: Methodology

This overview of systematic reviews undertook a transparent identification, selection, extraction and synthesis of relevant systematic reviews. We conducted the overview according to the principles of systematic reviewing in terms of attempting to be systematic, transparent and rigorous within the available resources.(1, 2) We also conducted the overview according to an agreed protocol. This section outlines the methods we used to undertake the overview, and sets out the stages involved.

2.1 STUDY TYPES

Systematic reviews and overviews of systematic reviews investigating the uptake or implementation of guidelines were eligible for inclusion in this overview. Systematic reviews were defined as reviews that have the following characteristics:

- A stated and clear research question;
- A statement of the eligibility criteria which have guided the selection of studies for the systematic review, including a statement about eligible study designs;
- Indications of an extensive search for relevant studies, i.e. searches beyond MEDLINE;
- A description of study selection methods;
- A synthesis of the included studies, either narrative or statistical;
- A list or table of included studies;
- An assessment of the quality of the included studies.

Individual studies (unless they were the only study identified within a systematic review), non-systematic review articles and opinion articles were not eligible for inclusion.

We did not include studies that investigated specific interventions to promote adherence, nor did we include studies that investigated compliance alone.

2.2 SEARCH STRATEGY

The literature search was conducted in a small number of relevant databases to identify systematic reviews. We conducted a focused search of the following resources:

- The Cochrane Library, as the best single source of systematic reviews in the Cochrane Database of Systematic Reviews (CDSR), the Database of Abstracts of Reviews of Effects (DARE) and the Health Technology Assessment (HTA) database;
- The Guidelines International Network (GIN) website to identify reviews relevant to the topic or reviews presented at conferences;
- McMaster Health Systems Evidence resource (http://www.healthsystemsevidence.org/open-search.aspx);
- MEDLINE, for systematic reviews published in 2013 only, to identify reviews that might not yet have reached DARE.

The search strategy used to identify studies in the Cochrane Library is presented in Figure 2.1. This strategy comprises two sections. Lines 1 to 8 are a search for Medical Subject Headings (MeSH) relevant to guidelines, combined with text-word searches for terms related to implementation. The second section of the strategy (lines 9-12) searches for guideline implementation as a single concept. This strategy identified 224 records in the CDSR and DARE. The other search strategies are listed in Appendix B.

Figure 2.1: Search strategy to identify systematic reviews reporting implementation/uptake of guidelines in the Cochrane Library

ID	Search Hits
#1	MeSH descriptor: [Guidelines as Topic] explode all trees
#2	MeSH descriptor: [Guideline] explode all trees
#3	MeSH descriptor: [Clinical Protocols] this term only
#4	MeSH descriptor: [Critical Pathways] this term only
#5	MeSH descriptor: [Consensus] this term only
#6	MeSH descriptor: [Health Planning Guidelines] this term only
#7	(implement* or aware* or uptake or up-take or takeup or take-up or adhere or adhered or adherence or concordance or accordance or adopt* or comply or complies or compliance or disseminat* or spread or spreading or barrier or barriers or facilitat*):ti,ab,kw
#8	(#1 or #2 or #3 or #4 or #5 or #6) and #7
#9	((guideline* or guidance* or recommended or recommendation* or advised or advice or standard or standards or statement* or consensus or policy or policies or protocol*) near/10 (implement* or aware* or uptake or up-take or takeup or take-up or adhere or adhered or adherence or concordance or accordance or adopt* or comply or complies or compliance or complying or disseminat* or spread or spreading or barrier or barriers or facilitat*)):ti,ab,kw
#10	MeSH descriptor: [Health Plan Implementation] this term only
#11	MeSH descriptor: [Guideline Adherence] this term only
#12	#9 or #10 or #11
#13	#12 or #8
#14	#13 in Cochrane Reviews (Reviews and Protocols) and Other Reviews

Key:

*	truncation symbol; words beginning with the specified stem
NEAR/n	proximity operator: words must appear together, within a specified number of words
.ti,ab,kw.	search terms in the title ,abstract or keywords
MeSH descriptor	subject heading
Exp	exploded subject heading

The searches were limited to English language reviews conducted over the last decade (since 2003). The reference lists of relevant reviews were searched to identify any further reviews and the results of the searches were managed within the EndNote bibliographic software package.

2.3 SELECTION OF ELIGIBLE STUDIES

One reviewer undertook initial record selection based on the title and abstract and removed the obviously irrelevant records, such as reports of individual trials and reports of ineligible interventions (first pass). This resulted in a list of potentially relevant systematic reviews. If there was uncertainty about whether a record was relevant, it was selected for further checking.

The records were then assessed in more detail, based on the full text of potentially systematic reviews (second pass). The full papers were assessed for relevance by one reviewer and checked by a second reviewer (third pass). Discrepancies were resolved through discussion or by consulting a third reviewer. The list was also passed to the NICE team for review.

The number of systematic reviews identified by the search and excluded at various stages is reported in a PRISMA study flow diagram (3) (Figure 3.1).

2.4 DATA EXTRACTION

We read the selected systematic reviews and summarised the key messages, taking into account whether the review question was relevant for specific health conditions or to all guidelines. We described the groups whose uptake/implementation was investigated. Where possible we assessed the degree of overlap across reviews, but this was only possible at a very high level due to time constraints. We also summarised the limitations of the reviews identified and the gaps in the evidence, as described by their authors.

We developed a data extraction template in Excel and extracted:

- Review identification data;
- Review objectives;
- Number of studies identified;
- Population;
- Key review results;
- Limitations of the review (as described by review authors);
- Gaps in the evidence (as described by review authors).

2.5 QUALITY ASSESSMENT

The following text, describing the AMSTAR questions, is largely taken from the AMSTAR website (http://www.amstar.ca). The quality of included systematic reviews was assessed using criteria based on the AMSTAR tool.(4) (Table 2.1). The quality assessment was used to provide an assessment of the risk of bias for each review and was conducted by one reviewer. The full, detailed quality assessments of each included systematic review can be found in Appendix D.

Table 2.1: Review quality assessment checklist (AMSTAR)

Review ID or acronym		
Review question	**How is the question addressed in the review?**	**Grade (yes/no/not clear/N/A)**
Was an 'a priori' design provided?		
Was a comprehensive literature search performed?		
Was there duplicate study selection and data extraction?		
Was the status of publication (i.e. grey literature) used as an inclusion criterion?		
Was a list of studies (included and excluded) provided?		
Were the characteristics of the included studies provided?		
Was the scientific quality of the included studies assessed and documented?		
Was the scientific quality of the included studies used appropriately in formulating conclusions?		
Were the methods used to combine the findings of studies appropriate?		
Was the likelihood of publication bias assessed?		
Was the conflict of interest stated?		

A priori design was noted when the research question and inclusion criteria were established before the conduct of the review.

We note that comprehensive searches are usually impossible. In this context a 'comprehensive' literature search was considered to mean that at least two electronic sources were searched and the review provided the years and databases used (e.g. Central, EMBASE, and MEDLINE). The keywords and/or subject headings (such as MeSH) used in the strategies must have been stated and, where feasible, the search strategy must have been provided. We required all searches to be supplemented by additional activities such as consulting current journal contents pages, reviews, textbooks, specialized registers, or experts in the particular field of study, or by reviewing the references in the relevant studies found.

We considered duplicate study selection and data extraction to be adequate when at least two independent reviewers were involved at the study selection and data extraction stages. A consensus procedure for disagreements should have been reported.

We noted that authors should have stated that they searched for reports regardless of their publication type and should have reported whether or not they had excluded any studies (from the systematic review), based on their publication status, language or other features.

A list of included and excluded studies should have been provided.

Data from the original studies should have been provided on the participants, interventions and outcomes in an aggregated form such as a table. The ranges of characteristics in all of the studies analysed (e.g. age, ethnicity, gender, relevant socioeconomic data, disease status, duration, severity, or other diseases) should have been reported.

The results of the assessment of methodological rigour and scientific quality were noted where they had been considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations.

We considered an assessment of publication bias to be:

- Adequate if the review included a combination of graphical aids (e.g. funnel plot, other available tests) and/or statistical tests (e.g. Egger regression test);
- Unclear, if publication bias was not reported;
- Inadequate, if publication bias was considered but no graphical aids or statistical tests were used.

We considered conflicts of interest to have been addressed where potential sources of support (such as funding sources) were clearly acknowledged.

2.6 DATA ANALYSIS

The systematic reviews were summarised in tables providing data on their methods and key results. We have provided a narrative summary discussing key messages, patterns across the reviews, limitations and gaps in the evidence. An overall assessment of the strength of the research evidence is also provided.

Section 3: Results

3.1 SEARCH RESULTS

The searches yielded 1,126 records. There were no duplicates. Of these, 16 records were considered potentially relevant following assessment based on the title and abstract of each record. Full paper copies of these records were assessed and, of these, 15 reviews (published in 15 papers) met the inclusion criteria. The study identification flowchart is shown in Figure 3.1. A list of the included reviews is presented in Table 3.1.

Figure 3.1: Flow diagram showing the review identification process

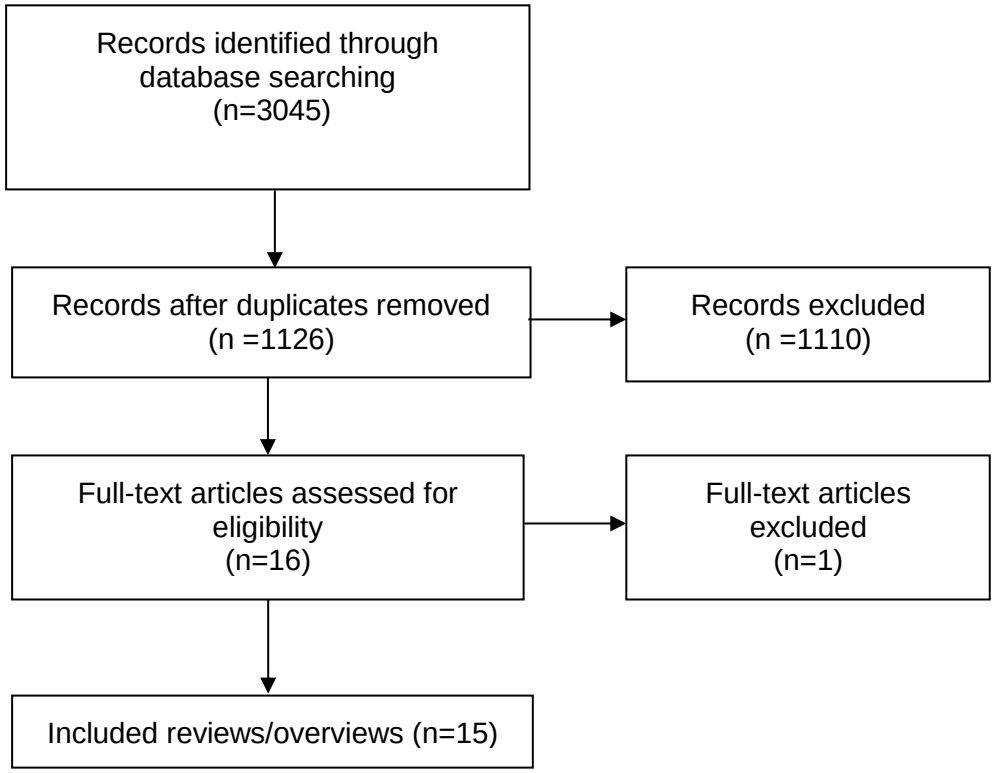

Table 3.1: Bibliographic details of included reviews and overviews

Review name	Reference
Brusamento 2012	Brusamento, S., et al. (2012). Assessing the effectiveness of strategies to implement clinical guidelines for the management of chronic diseases at primary care level in EU Member States: a systematic review. Health Policy 107(2-3): 168-183.
Carlsen 2007	Carlsen, B., et al. (2007). Thou shalt versus thou shalt not: a meta-synthesis of GPs' attitudes to clinical practice guidelines. British Journal of General Practice 57(545): 971-978.
Chaillet 2006	Chaillet, N., et al. (2006). Evidence-based strategies for implementing guidelines in obstetrics: a systematic review. Obstetrics & Gynecology 108(5): 1234-1245.
Cochrane 2007	Cochrane, L. J., et al. (2007). Gaps between knowing and doing: understanding and assessing the barriers to optimal health care. Journal of Continuing Education in the Health Professions 27(2): 94-102.
Francke 2008	Francke, A. L., et al. (2008). Factors influencing the implementation of clinical guidelines for health care professionals: a systematic meta-review. BMC Med Inform Decis Mak 8: 38.
Grimshaw 2004	Grimshaw, J. M., et al. (2004). Effectiveness and efficiency of guideline dissemination and implementation strategies. Health Technology Assessment (Winchester, England) 8(6): iii-iv, 1-72.
Gurses 2010	Gurses, A. P., et al. (2010). Using an interdisciplinary approach to identify factors that affect clinicians' compliance with evidence-based guidelines. Critical Care Medicine 38(8 Suppl): S282-291.
Heselmans 2009	Heselmans, A., et al. (2009). Effectiveness of electronic guideline-based implementation systems in ambulatory care settings - a systematic review. Implementation Science 4: 82.
Lineker 2010	Lineker, S. C. and J. A. Husted (2010). Educational interventions for implementation of arthritis clinical practice guidelines in primary care: effects on health professional behavior. J Rheumatol 37(8): 1562-1569.
Medves 2010	Medves, J., et al. (2010). Systematic review of practice guideline dissemination and implementation strategies for healthcare teams and team-based practice. Int J Evid Based Healthc 8(2): 79-89.
Mickan 2011	Mickan, S., et al. (2011). Patterns of 'leakage' in the utilisation of clinical guidelines: a systematic review. Postgraduate Medical Journal 87(1032): 670-679.
Okelo 2013	Okelo, S. O., et al. (2013). Interventions to modify health care provider adherence to asthma guidelines: a systematic review. Pediatrics 132(3): 517-534.
Prior 2008	Prior, M., et al. (2008). The effectiveness of clinical guideline implementation strategies--a synthesis of systematic review findings. J Eval Clin Pract 14(5): 888-897.
Simpson 2005	Simpson, S. H., et al. (2005). Do guidelines guide pneumonia practice? A systematic review of interventions and barriers to best practice in the management of community-acquired pneumonia. Respiratory Care Clinics of North America 11(1): 1-13.
Van der Wees 2008	van der Wees, P. J., et al. (2008). Multifaceted strategies may increase implementation of physiotherapy clinical guidelines: a systematic review. Australian Journal of Physiotherapy 54(4): 233-241.

3.2 DESCRIPTION OF INCLUDED SYSTEMATIC REVIEWS

Table 3.1 summarises the included systematic reviews in terms of their objectives, search dates, study type and number of studies included, interventions and comparators.

3.2.1 Studies Included in the Systematic Reviews

Fifteen systematic reviews were identified, published from 2004 to 2013. They included between three and 256 primary studies. Most systematic reviews included randomised controlled trials (RCTs); some included other study types. Search dates varied widely; some reported searching databases from inception, while others employed more stringent limitations. The upper limit of search dates was between 1998 and 2012 (data not shown).

More than half of the included reviews did not report the country in which their included studies were conducted. For the seven reviews that did provide this data, all were from Organisation for Economic Co-operation and Development (OECD) countries, with the majority conducted in the USA, Canada and Europe (data not shown). There may be limits to the applicability of this evidence resulting from differences in healthcare delivery, policy the different contexts of clinical practice.

Six included reviews assessed single specialty guidelines and often made statements that their results were only applicable to the specialty evaluated. The specialities included were obstetrics (5), osteoarthritis and rheumatoid arthritis (6), asthma (7), community acquired pneumonia (8), physiotherapy (9) and infection rates (10). The remaining nine reviews did not specifically report the type of guideline implemented, or included a range of guidelines on different topics.

3.2.2 Interventions

Of the fifteen systematic reviews included, eleven assessed intervention strategies to promote guideline uptake (5-9, 11-15, 18), while five reviews identified barriers and factors influencing implementation.(10, 16-19) Two of these reviews investigated both intervention strategies and barriers.(8, 18) One additional review investigated ‘leakage’ (in which research evidence ‘leaks’ at various steps and reduces the extent to which research findings are implemented in practice) during four steps: awareness, agreement, adoption and adherence to guidelines.(19)

Two publications were overviews of systematic reviews (i.e. the eligible study designs were systematic reviews). One publication was an overview of systematic reviews investigating factors influencing adherence (18) and included the Grimshaw review (12) which is included in this report. The other publication was an overview of systematic reviews assessing implementation strategies (15). It included both the Grimshaw (12) and Simpson (8) reviews, both of which are included studies in this report.

3.2.3 Types of Participants

Of the fifteen included reviews/overviews, eight were targeted to healthcare professionals (6, 10, 12, 14-16, 18, 19), one of which specified primary care practitioners (16). Five reviews included both health professionals and their patients (5, 7-9, 11), one of which specified primary care practitioners and patients (11). One review did not report the types of participants included (17) and another reported that 50% of participants were physicians (13).

Table 3.2: Characteristics of the included reviews

dy name	Objectives	Type of guideline implemented	Intervention	Comparator	Primary outcomes	Type of participants	Number and design of included studies.
Brusamento 2012(11)	To evaluate the effectiveness of strategies to implement clinical guidelines for chronic disease management in primary care in EU member states.	Two studies assessed the implementation of guidelines on osteoarthritis, four on chronic obstructive pulmonary disease, four on hypertension, six on coronary heart disease, six on asthma and seven on type two diabetes mellitus.	The intervention could be single or multifaceted. The study could compare one or more interventions to a control group, or two or more interventions could act as control group for each other.	A control group, or two or more interventions could act as control group for each other.	The effectiveness of the implementation strategy was measured by performance indicators on process of care (including prescription behaviour) and/or indicators on patients' health outcomes.	Primary care physicians and their adult patients.	21 included studies. 14 cluster-RCTs, three RCTs, three controlled-before-and-after studies and one controlled clinical trial.
Chaillet 2006(5)	To evaluate what strategies effectively implement clinical practice guidelines in obstetric care and to identify any barriers to change and facilitators.	Obstetric guidelines.	Strategies for the implementation of clinical practice guidelines including: educational strategies, audit and feedback, opinion leaders, quality improvement strategies, academic detailing, reminders, multifaceted strategies (including at least two of the above strategies and/or	Not reported	Objective measures of performance during the implementation of clinical practice guidelines e.g. decreased use of fetal heart monitoring or promotion of vaginal birth	Health professionals, non-health professionals and women receiving peripartum care.	33 included studies. 10 cluster-RCTs, six RCTs, one controlled before-after study, and 16 interrupted time series studies.

dy name	Objectives	Type of guideline implemented	Intervention	Comparator	Primary outcomes	Type of participants	Number and design of included studies.
			physician and hospital payment and malpractice reform).		after Caesarean delivery.		
Carlsen 2007(16)	To assess general practitioners' (GPs) attitudes and experiences with clinical practice guidelines.	Variety of topics: treatment, prevention, screening, mental and physical health pertaining to adult, older and child patients.	There was no intervention.	Not reported	Themes representing attitudes and experiences towards guidelines: questioning the guidelines, GPs' own experiences, preserving the doctor-patient relationship, professional responsibility, practical issues and guideline format.	GPs	12 included studies. 7 focus group studies and 5 interview studies. No other information was provided.

dy name	Objectives	Type of guideline implemented	Intervention	Comparator	Primary outcomes	Type of participants	Number and design of included studies.
Lineker 2010(6)	To evaluate the influence of educational programmes to implement clinical practice guidelines for osteoarthritis and rheumatoid arthritis in primary care.	Osteoarthritis	Educational outreach, peer-facilitated workshops and audit and feedback.	Not reported	Behavioural outcomes that ensured knowledge utilisation (i.e. very broad outcomes included prescribing, reduction in non-steroidal anti-inflammatory use, x-ray orders, referrals, any management behaviour)	Clinicians and GPs	7 included studies. 4 RCTs, 2 cluster RCTs and 1 non-randomised trial using cross sectional data at 2 time points.
Okelo 2013(7)	To assess the effect of interventions designed to improve health care providers' adherence to asthma guidelines on: (1) health care process outcomes, (2) clinical outcomes, (3) health care processes that subsequently	Asthma	Interventions to improve adherence to guidelines including decision support (health information technology and paper-based), organisational change, feedback and audit, clinical pharmacy support, education only, quality improvement/pay-for-performance, multicomponent and information only.	Usual care and comparisons between interventions.	Outcomes that the authors considered 'critical'. Health care outcomes: prescriptions for controller medicine, self-management education and asthma action plans. Clinical outcomes: missed days of school or work, emergency department	Children or adults with asthma, health care providers (physicians, nurses, physiotherapists/physical therapists, respiratory therapists, pharmacists and other health care providers).	73 included studies. 34 RCTs, 29 pre-post studies, 4 cluster randomised studies, 3 controlled pre-post studies, 2 non-randomised controlled studies, 1 cohort study.

dy name	Objectives	Type of guideline implemented	Intervention	Comparator	Primary outcomes	Type of participants	Number and design of included studies.
	impact clinical outcomes.				visits or hospitalisations.		
Simpson 2005(8)	(1) To identify the effects of guidelines for the treatment or community acquired pneumonia and (2) to identify barriers to their adoption and use.	Community acquired pneumonia	Site-specific clinical pathways, guidelines with local adaptations, locally developed guidelines with and without a multifaceted strategy and a critical pathway. Results were not reported separately for different types of strategy (according to the CRD report).	Not reported	Length of stay, bed days per patient managed, mortality, the decision to admit to hospital, time until administration of the first antibiotic, use of guideline recommended antibiotics, appropriate monotherapy and duration of intravenous therapy.	Physicians and their patients with community acquired pneumonia.	14 included studies. 6 studies assessed the effectiveness of guidelines (2 cluster RCTs, 2 before-and-after studies with concurrent controls, 2 time series studies) and 8 studies described barriers to their adoption and use (various designs).

dy name	Objectives	Type of guideline implemented	Intervention	Comparator	Primary outcomes	Type of participants	Number and design of included studies.
Van der Wees 2008(9)	To assess the effectiveness of strategies to increase the implementation of physiotherapy clinical guidelines.	Physiotherapy guidelines produced by professional, health or government organisations, publicly available and based on the results of a systematic review. Two low back pain guidelines and 1 whiplash guideline.	Interactive educational sessions (combined with dissemination of guidelines, self-evaluation form, discussion forms, Back Pain Disability scale) (1 study), educational session by opinion leaders and follow up (combined with dissemination of guidelines) (1 study) and interactive evidence-based educational session by local opinion leader (1 study).	Dissemination of guidelines, self evaluation form, discussion form and Back Pain disability scale (1 study), dissemination of guidelines (1 study) and standard inservice training session (1 study).	Variable outcomes depending on study. These could be classified as professional practice outcomes (such as goal setting and advice), patient health outcomes (functioning, pain and disability) and economic outcomes (direct medical and productivity costs).	Physiotherapists and their patients.	3 cluster-RCTs.
Cochrane 2007(17)	To assess the barriers to health care provider adherence of guidelines, diffusion of innovation and implementation of evidence into practice.	Not reported.	There was no intervention. The purpose was to identify barriers to adherence or implementation of guidelines.	Not reported	No outcomes.	Not reported	256 included studies. 178 survey-based studies, 16 focus group studies, 18 interview studies and 44 mixed methods studies.
Francke 2008(18)	To assess which factors	The majority (8) of reviews	The review did not have an intervention or	Not reported	Factors influencing	Most studies targeted physicians but a few	12 systematic reviews.

dy name	Objectives	Type of guideline implemented	Intervention	Comparator	Primary outcomes	Type of participants	Number and design of included studies.
	influence the implementation of guidelines and to explore the research within this field.	included guidelines on various topics (different specialties, prevention, diagnosis or treatment) but some reviews were of single topics (mental health, antimicrobial use in common infections, community acquired pneumonia and pressure ulcer treatment).	comparator. It attempted to identify the factors that influenced guideline implementation either positively or negatively.		guideline implementation.	targeted other health professionals (nurses, allied health professionals) and policy makers.	
Grimshaw 2004(12)	To assess the effectiveness and costs of different guideline development, dissemination and implementation strategies. To develop a framework for deciding when it is efficient to	Various. National professional expert body or national government body (35% of studies), local clinicians (30% of studies) and other source (10% of studies). The source of	Guideline dissemination and implementation strategies.	Not prespecified - after studies included, 69% of controls received no intervention, 22% of controls received one intervention and 10% received more than one	Objective measures of provider behaviour and/or patient outcome.	Medically qualified health care professionals.	235 included studies. 110 cluster-RCTs, 29 patient RCTs, 7 cluster-allocated controlled clinical trials, 10 patient allocated controlled clinical trials, 40 controlled

dy name	Objectives	Type of guideline implemented	Intervention	Comparator	Primary outcomes	Type of participants	Number and design of included studies.
	develop and introduce clinical guidelines.	guidelines was not clear in 25% of studies.		intervention.			before-and-after studies and 39 interrupted time series studies.
Gurses 2010(10)	To identify factors that affect clinicians' compliance with evidence-based guidelines using an interdisciplinary approach. To develop a conceptual framework that can guide the design of effective interventions.	Mostly guidelines to reduce infection rates but also other clinical areas.	There was no intervention. The objective was to identify factors that influenced clinicians' compliance with guidelines.	Not reported	Factors were grouped in categories affecting guideline compliance.	Clinicians.	The authors reported the number of models that were identified from studies.
Heselmans 2009(13)	To evaluate the effectiveness of computer-based guideline	Guidelines for disease management: 71% for chronic	System implementations supported by one or more additional interventions as long as the additional	Either usual care or another guideline-based implementation	Patient outcomes with direct and surrogate endpoints (e.g.	End users of guidelines of whom at least 50% were physicians.	27 included studies. 20 cluster RCTs, one controlled

dy name	Objectives	Type of guideline implemented	Intervention	Comparator	Primary outcomes	Type of participants	Number and design of included studies.
	implementation systems in ambulatory care settings.	diseases, 24% for acute diseases and 1 for both acute and chronic diseases.	interventions concerned components of an implementation strategy were of secondary importance and were targeted at physicians.	method (results were stratified by the 2 types of comparator).	blood pressure, glucose levels) and process outcomes (physician adherence, compliance to guidelines, organisational, logistic and financial issues).		clinical trial, 2 controlled before-after studies, 4 interrupted time series studies.
Medves 2010(14)	To assess the effectiveness of different practice guideline and dissemination strategies on team based practice and/or patient outcomes.	Not reported.	Ten implementation strategies (based on Effective Practice and Organisation of Care Group taxonomy): dissemination of educational materials, educational meetings, local consensus processes, educational outreach visits, local opinion leaders, patient-mediated strategies, audit and feedback, reminders, marketing, mass media. The review also assessed patient incentives, and organisational interventions (revision of professional roles, clinical multidisciplinary teams, continuity of care,	Not reported	Change in knowledge, change in practice, change in patient outcomes, change in economic outcomes (reported according to how the study analysed it, no further analysis was presented in the review).	Healthcare teams (practices with two or more professions or disciplines).	88 studies included. 28 RCTs, 27 comparative cohort studies, 34 descriptive or case studies. Note: this totals 89 and it is unclear whether 88 or 89 studies were included.

dy name	Objectives	Type of guideline implemented	Intervention	Comparator	Primary outcomes	Type of participants	Number and design of included studies.
			communication and case discussion) and structural intervention (changes in medical records systems).				
Mickan 2011(19)	To assess the patterns of leakage in the utilisation of clinical guidelines using Pathman's awareness to adherence model.	Various: drug interventions (stable angina, chronic heart failure, hypertension and child asthma), medical management (hypertension, anaesthetic practice), vaccination schedules (infants, children and elderly adults), screening tests (Barrett's oesophagus and chlamydia) and health promotion (advising	No intervention or control. Studies were included if they reported on awareness and agreement and adoption and/or adherence.	No control	Rates of awareness and agreement and adoption and/or adherence.	Target users of guidelines, included family physicians, cardiology and internal medicine specialists, paediatricians, GPs, anaesthesiologists, nurses, primary care physicians, retired specialists and members of three specialty organisations.	11 included studies. All were surveys or cross sectional studies (sampling from registers and lists).

dy name	Objectives	Type of guideline implemented	Intervention	Comparator	Primary outcomes	Type of participants	Number and design of included studies.
		parents on media use, for GPs treating adults with hypertension).					
Prior 2008(15)	To assess the effectiveness of clinical guideline implementation strategies.	Guidelines that were not condition specific.	Implementation strategies: audit and feedback, continuing medical education, decision support systems, distribution/dissemination only, educational meetings, educational outreach, financial incentives, guideline content, local opinion leaders, management support, mass media, material incentive, multifaceted intervention, organisational intervention, patient-specific intervention, procedural justification, reminders, traditional educational and user-developed consensus guidelines.	Not reported	Clinical process change, compliance and/or cost benefit analysis.	Clinicians.	33 systematic reviews.

3.3 QUALITY OF INCLUDED SYSTEMATIC REVIEWS

Table 3.3 shows the quality ratings assigned to the included reviews using the AMSTAR quality assessment tool.

3.3.1 Q1. A Priori Design

For three of the included reviews, it was clear that an *a priori* design had been used, that is, the research question and inclusion criteria had been established before the conduct of the review.(7, 14, 19) In the remaining twelve reviews it was unclear whether an a priori design had been developed; authors for all twelve reviews stated their objectives, but did not specifically refer to a protocol, ethics approval, or pre-determined/a priori published research objectives. We note that some authors stated that they followed Cochrane methods when conducting their review: we tended to grade these reviews 'Unclear' if the specific Cochrane methods were not described.

3.3.2 Q2. Duplicate Study Selection and Data Extraction

To adequately fulfil this criterion, reviews should have reported the use of at least two independent data extractors and a consensus procedure for disagreements should have been in place. Five reviews reported duplicate study selection and data extraction.(7, 11, 13, 18, 19) Three reviews did not report details of the study selection and data extraction processes.(6, 9, 15) It was unclear whether duplicate study selection and data extraction were undertaken in seven reviews.

3.3.3 Q3. Literature Searches

Nine of the included reviews reported adequate search strategies (5-7, 9, 10, 12, 13, 15, 17). To be considered adequate, searches were required to have been conducted in at least two electronic sources and supplementary searches had to have been undertaken.

Two reviews did not provide adequate reporting of search strategies. One review described the search strategy in general, but no specific keywords or MESH terms were stated.(11) The other review searched only one electronic database.(8)

The remaining four reviews did not report enough data to assess adequately the quality of the search strategies.(14, 16, 18, 19)

3.3.4 Q4. Status of Publication Used as an Inclusion Criterion?

To adequately fulfil this criterion, the authors should have stated that they searched for reports regardless of their publication type. The authors should have stated whether they excluded any reports (from the systematic review), based on their publication status, language or other feature. This criterion was poorly reported. In seven reviews it was not clear whether the authors searched for reports regardless of their publication type (5, 8, 11-

14, 18, 19) and a further seven reviews were found to have limited inclusion by the status of the publication.(5-7, 10, 15-17) Only one review adequately fulfilled this criterion.(9)

3.3.5 Q5. Was a List of Studies (Included and Excluded) Provided?

None of the included reviews provided a list of included studies. In one review the excluded studies and the reason for the studies' exclusion were presented in a table, but the included studies were not presented in a list.(11)

3.3.6 Q6. Were the Characteristics of the Included Studies Provided?

To be considered adequate, systematic reviews should have provided, in an aggregated form such as a table, data from the original studies on the participants, interventions and outcomes. The ranges of characteristics in all the studies analysed (e.g. age, race, sex, relevant socioeconomic data, disease status, duration, severity, or other diseases) should have been reported. Only one review adequately reported the characteristics of the included primary studies.(7) Five reviews did not report characteristics of the included studies (5,10, 14, 15, 17) and a further nine reviews were considered inadequate, mainly because they did not report ranges of characteristics.

3.3.7 Q7. Was the Scientific Quality of the Included Studies Assessed and Documented?

Seven of the fifteen included reviews adequately assessed the quality of their included primary studies. Four reviews assessed the quality of included studies using a checklist adapted from the Cochrane Effective Practice and Organisation of Care (EPOC) Group (5,9, 12, 13), one used the Cochrane Collaboration's risk of bias tool (7), one used the AMSTAR checklist (15) and another used the Oxman and Guyatt Quality Assessment Checklist for Reviews.(18)

A further three reviews were scored 'unclear' against this criterion, because although they reportedly used a quality assessment tool, the results of the quality assessments were not summarised or discussed. (6, 11, 14)

Five reviews did not report the quality of their included primary studies.(8, 10, 16, 17, 19)

3.3.8 Q8. Was the Scientific Quality of the Included Studies Used Appropriately in Formulating Conclusions?

Having assessed the methodological rigour and scientific quality of included studies, this data should then be considered in the analysis and the conclusions of the review, and explicitly stated in formulating recommendations. Only one review considered the quality of the included studies in its conclusions.(15)

3.3.9 Q9. Were the Methods Used to Combine the Findings of Studies Appropriate?

This criterion refers to the appropriateness of the method chosen to combine primary studies within the systematic review. The majority of studies (n=11) used appropriate methods to synthesise findings in that all reported a narrative synthesis. One review did not provide details of data synthesis (10) and in a further two reviews, details of the data synthesis were not clear.(5, 8) One review did not present data synthesis.(6)

3.3.10 Q10. Was the Likelihood of Publication Bias Assessed?

An assessment of publication bias should include a combination of graphical aids (e.g. funnel plot, other available tests) and/or statistical tests (e.g. Egger regression test). One review addressed publication bias, but did not undertake a formal assessment.(7)

3.3.11 Q11. Was the Conflict of Interest Stated?

A disclosure of conflicts of interest was considered adequate when potential sources of support were clearly acknowledged in both the systematic review and the included primary studies. None of the included reviews acknowledged sources of support for either the systematic review or the individual primary studies.

3.3.12 Summary of Methodological Quality

Reviews that adequately reported eight of the possible eleven AMSTAR criteria were assumed to be high quality reviews. Those adequately reporting between five and eight criteria were considered to be of moderate quality, and reviews reporting four or fewer criteria adequately were considered to be of poor quality.

Overall, the included systematic reviews were of poor methodological quality. Lack of reporting was an issue for all included reviews. The number of criteria reported as unclear was high, with every review showing a lack of clarity. Only one review achieved more than half of the methodological criteria and was assessed to be of moderate quality.(7) Eight of the 15 reviews met two or fewer quality criteria from a possible eleven on the AMSTAR checklist.

None of the reviews assessed the likelihood of publication bias or adequately reported conflicts of interest.

Table 3.3: Summary of the methodological quality of included studies (assessed using AMSTAR criteria)

Study name	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7	Question 8	Question 9	Question 10	Question 11
Brusamento 2012(11)	Unclear	Yes	No	Unclear	Unclear	Unclear	Unclear	No	Yes	No	No
Carlsen 2007(16)	Unclear	Unclear	Unclear	No	No	Unclear	No	No	Yes	No	No
Chaillet 2006(5)	Unclear	Unclear	Yes	Unclear	No	No	Yes	No	Unclear	No	No
Cochrane 2007(17)	Unclear	Unclear	Yes	No	No	No	No	Unclear	Yes	No	No
Francke 2008(18)	Unclear	Yes	Unclear	Unclear	No	Unclear	Yes	No	Yes	No	No
Grimshaw 2004(12)	Unclear	Unclear	Yes	Unclear	No	Unclear	Yes	Unclear	Yes	No	No
Gurses 2010 (10)	Unclear	Unclear	Yes	No	No	No	No	N/A	No	No	No
Heselmans 2009 (13)	Unclear	Yes	Yes	Unclear	No	Unclear	Yes	No	Yes	No	No
Lineker 2010(6)	Unclear	No	Yes	No	No	Unclear	Unclear	No	N/A	No	No

Study name	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7	Question 8	Question 9	Question 10	Question 11
Medves 2010 (14)	Yes	Unclear	Unclear	Unclear	No	No	Unclear	No	Yes	No	No
Mickan 2011 (19)	Yes	Yes	Unclear	Unclear	No	Unclear	No	No	Yes	No	No
Okelo 2013 (7)	Yes	Yes	Yes	No	No	Yes	Yes	Unclear	Yes	Yes	No
Prior 2008 (15)	Unclear	No	Yes	No	No	No	Yes	Yes	Yes	No	No
Simpson 2005(8)	Unclear	Unclear	No	Unclear	No	Unclear	No	No	Unclear	No	No
Van der Wees 2008(9)	Unclear	No	Yes	Yes	No	Unclear	Yes	No	Yes	No	No

N/A = Not Applicable.

3.4 STRATEGIES TO PROMOTE GUIDELINE UPTAKE

The terminology used in the evidence statements is the wording used by the review authors:

- 'inconclusive' means that a conclusion could not be reached.
- 'ineffective' means that the intervention had either no effect, or a negative effect.

There was very little data available on effect size. We have reported all instances where the reviews reported effect sizes.

Where an overview of systematic reviews is reported in an evidence summary, it is always presented first.

3.4.1 Printed Dissemination of Guideline

Four reviews identified studies reporting mailed dissemination of guidelines and reported conflicting evidence.(11, 12, 14, 15)

One poor quality review identified eighteen primary studies comparing mailed dissemination with a no intervention control. The majority of primary studies assessing this intervention observed improvements in the process of care, although the effects were modest ranging from 4 to 17% (median 8.1%).(12) An additional poor quality review reported significant findings in that 43 of the 59 included studies (72.3%) reported significant findings, but the authors stated that it was not possible to determine whether distribution was directly responsible for the findings.(14)

Conversely, two poor quality reviews reported a lack of efficacy. One review identified a controlled before-and-after study that showed that mail dissemination of asthma and chronic obstructive pulmonary disease (COPD) guidelines had no effect on outcomes.(11) A second review reported six reviews with ineffective findings and seven reviews with unclear or inconclusive findings regarding mailed dissemination.(15)

2.1 Evidence statement: Mailed dissemination for guideline implementation

There is mixed evidence from four reviews on the effectiveness of mailed dissemination for improving guideline uptake.[1,2,3,4.] There is some evidence from two reviews that mailed dissemination is effective[2,3] and evidence from one review that mailed dissemination if ineffective.[1.] One review reported inconclusive results.[4]

[1] Brusamento *et al.,* 2012
[2] Grimshaw *et al.,* 2004
[3] Medves *et al.,* 2010
[4] Prior *et al.,* 2008

3.4.2 Computerised Decision Systems

Four reviews identified studies reporting computerised decision systems as a strategy for dissemination of guidelines.(7,11,13,15)

A poor quality overview of systematic reviews identified eight systematic reviews, all of which reported positive findings with effect sizes ranging from 8% to 72% improvement in process or compliance.(15)

One poor quality review identified three cluster-RCTs assessing the effectiveness of computerised decision systems on the implementation of asthma guidelines, diabetes guidelines and asthma and COPD guidelines.(11) The three computerised systems implemented in these studies provided the physician with information and advice on disease management or just on the treatment. In one study, general practitioners (GPs) were presented with an overview of the quality of care for diabetes patients in her/his own practice in a format that could be compared to that of colleagues. The study of diabetes guidelines showed an improvement in drug prescription, but no significant difference in other measures of care processes or patient outcomes. The other two studies on respiratory diseases showed only marginal effects: improvement in two of the ten outcomes in the first study and improvement in drug prescription only for a subgroup of patients in the second study.(11)

A second, moderate quality review investigating asthma guidelines reported a combined outcome described as technology or paper-based interventions for decision making (not only 'computerised').(7) There was a significant increase in health care provider prescriptions, which ranged from 1% to 34% in pre-post studies and 2% to 17% in RCTs (15 studies). Ten studies favoured the use of decision support to improve the provision of self-management action plans to patients (range: 14 to 84%) and nine out of ten studies indicated that decision support reduced emergency department (ED) visits.(7)

One poor quality review identified seventeen studies investigating computerised decision systems and reported mixed findings.(13) Seven studies comparing electronic guideline-based systems with usual care showed improvements in process of care outcomes. However, these were not consistent. When electronic systems were compared with paper-based (7 studies) or other electronic systems (3 studies), there were no differences between groups. There was no evidence of a significant difference in patient outcomes for any comparison: electronic system compared with usual care (8 studies), electronic compared with paper-based system (5 studies), or in head-to-head studies comparing different electronic systems (1 study).(13)

2.2 Evidence statement: Computerised decision systems for guideline implementation

There is strong evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] that computerised decision systems are effective in increasing guideline uptake. However, there is evidence from one review that computerised decision systems are ineffective compared with usual care or paper based systems.[4]

[1] Prior *et al.,* 2008
[2] Okelo *et al.,* 2013
[3] Brusamento *et al.,* 2012
[4] Heselmans *et al.,* 2009

3.4.3 Educational Strategies

Seven reviews identified studies investigating educational strategies to promote the uptake of guidelines. These included educational meetings (6, 9, 12, 14), continuing education (5, 11, 15), and educational outreach visits (6, 14, 15)

3.4.3.1 Educational meetings

Four reviews reported studies investigating educational meetings.(6, 9, 12, 14)

One poor quality review investigating osteoarthritis and rheumatoid arthritis guidelines included four primary studies that ran 'peer-facilitated workshops'.(6) When the workshops included nurse case management, one primary study reported that the number of referrals to orthopaedics was reduced by 23% whilst in another study, workshops increased referrals to rehabilitation services.(6) Two poor quality reviews (one identified one primary study, the other identified three RCTs) both found that there were no evidence of significant effects on professional practice outcomes and suggested that the effects, if any, are likely to be small.(9, 12) A fourth poor quality review included 62 primary studies, of which 46 (74.2%) reported significant positive findings. However, the authors stated that it was not possible to determine whether these meetings were directly responsible for the findings.(14)

The included reviews investigating educational meetings were all of poor quality, thus there is insufficient evidence to draw conclusions about the value of educational meetings in improving guideline dissemination and uptake.

2.3 Evidence statement: Educational meetings for guideline implementation

There is mixed evidence from four systematic reviews[1,2,3,4] on the effectiveness of educational meetings for increasing guideline uptake. Two reviews reported improvements in guideline uptake following educational meetings; one review found that the inclusion of nurse case management to educational workshops to promote guideline uptake resulted in improvements in patient outcomes[1], while the other review reported the majority of included studies (74%) reported positive findings[4]. Two reviews did not find evidence of effectiveness on professional practice outcomes.[2,3.]

[1] Lineker and Husted, 2010
[2] van der Wees *et al.,* 2008
[3] Grimshaw *et al.,* 2004
[4] Medves *et al.,* 2010

3.4.3.2 Continuing education

Three reviews reported studies investigating continuing education.(5, 11, 15)

A poor quality overview of systematic reviews identified four systematic reviews. One review reported that continuing education improved physician knowledge (effect size 0.79 ± 0.38) and performance (effect size 0.55 ± 0.45), two reviews found small effects on professional practice and two reviews reported inconclusive findings. The components of continuing education were poorly described which precluded the authors from considering individual education strategies.(15)

One poor quality review investigating obstetric guidelines identified four primary studies reporting outcomes for continuing education strategies.(5) Continuing education was defined as any educative strategy, (such as a workshop or conference) intended to persuade providers to change their performance and maintain their competence. Two primary studies for management of mild hypertension and promotion of vaginal birth after Caesarean delivery were generally ineffective or showed a poor impact for implementing guidelines; no further details were provided about the interventions investigated. One primary study, using nurses as providers, presented mixed effects for implementing guidelines in foetal heart monitoring during labour. One 2-year exposure study with non-physician providers (nurses, social workers, and nutritionists), which took into account patients' experiences obtained effective reductions in the rate of pregnant smokers in line with guideline recommendations.(5)

Another poor quality review identified two primary studies that used formal training (no further details provided in the review report) to implement guidelines.(11) A Spanish cluster-RCT assessed the effect of a training session performed by a pulmonologist on implementation of COPD guidelines versus a control group. The second cluster-RCT focused on the dissemination of diabetes guidelines, comparing two intervention groups with each other and with a control group. Guidelines were disseminated by mail to GPs belonging to both intervention groups, but one group received additional two-day training.

The training included formal and group work sessions, but the trainers were not described. While the training was effective in the first study in improving GPs' ability to correctly diagnose, score and manage patients with COPD, the second study found no difference in the implementation of guidelines, neither between the two intervention groups nor between each of them and the control group.(11)

2.4 Evidence statement: Continuing education for guideline implementation

There is mixed evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] on the effectiveness of continuing education for increasing guideline uptake. All included overviews and systematic reviews reported mixed findings with both effective and ineffective results. All reviews were of poor quality and the components of continuing education were poorly described.

[1] Prior *et al.,* 2008
[2] Chaillet *et al.,* 2006
[3] Brusamento *et al.,* 2012

3.4.3.3 Educational outreach visits

Three reviews investigated educational outreach visits.(6, 14, 15)

A poor quality overview of systematic reviews included twelve primary studies reporting positive findings for educational outreach visits, with the size of the effect ranging from a 10% to 68% improvement in process or compliance. The most common components of the outreach visits were practice visits by educators, the provision of promotional material, and subsequent reminders or educational follow-up (15)

A second poor quality review identified two randomised controlled trials investigating osteoarthritis and rheumatoid arthritis guidelines.(6) One trial evaluated the effect of a physician education programme on reducing long term exposure to non-steroidal anti-inflammatory drugs (NSAID) in elderly patients and included several strategies; educational outreach by physician educators, reminder systems, and nurse follow up. There was a significant reduction in the number of patients taking NSAIDs (7%) in the intervention group relative to the control group at one-year. The second trial evaluated the effectiveness of an educational outreach programme delivered by trained pharmacists on physician prescribing practices. There was a significant improvement in overall prescribing practices (no further details reported). (6)

A third poor quality review identified twelve primary studies, eight of which reported significant findings for educational outreach visits. Visits were defined as a team of healthcare professionals from another institution or organisation providing education to other healthcare professionals. The authors stated that it was not possible to determine whether these educational visits were directly responsible for the findings.(14)

2.5 Evidence statement: Educational outreach visits for guideline implementation

There is strong evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] about the effectiveness of educational outreach visits for increasing guideline uptake. An overview of systematic reviews reported positive findings for practice visits by educators, the provision of promotional material, and subsequent reminders or educational follow-up.[1] One review shows that educational outreach visits delivered by pharmacists reduced inappropriate prescribing[2] and the other review reported that healthcare visits from outside an organisation were beneficial in providing education to healthcare professionals.[3]

[1] Prior *et al.,* 2008
[2] Lineker and Husted, 2010
[3] Medves *et al.,* 2010

3.4.4 Audit and Feedback

Seven reviews reported studies investigating audit and feedback.(5-7, 11, 12, 14, 15)

A poor quality overview of systematic reviews reported moderate evidence of effectiveness of audit and feedback ranging from a 17% decline, to a 63% improvement. Eight of 18 included systematic reviews reported positive findings, while ten reported unclear findings.(15)

A second, moderate quality review investigating asthma guidelines reported that there was insufficient evidence to determine whether audit and feedback influenced patient outcomes.(7) Audit and feedback strategies included interventions such as recording inhaler technique, benchmarking (comparing own prescribing performance with performance of a well performing GP), prioritized guideline review criteria on single card, medical record prompts for annual review of asthma management with guideline prompts, and individualized feedback on prescribing and decision strategies). The authors found consistent, moderate strength evidence that the intervention increased prescribing practices (ranging from 16 to 104% in 11 studies). There were inconsistent low strength results from five studies assessing effects on patient plans: self-management education, asthma action plans and asthma education. For self-management education, the difference in proportions ranged from 0.7 for peak flow meter use to 12.9 for inhaler technique education. For asthma action plans, there was an increase of 7.6% with the intervention compared to 4.5% with traditional education. For asthma education, the intervention resulted in a 46% to 133% increase pre- to post study.(7)[1]

A third poor quality review investigating obstetric guidelines identified eleven primary studies, nine of which demonstrated that audit and feedback had a positive impact on guideline implementation.(5) One study presented mixed effects because of the contamination of the control group by a national effort to promote vaginal birth after Caesarean delivery and the weakness of feedback quality. Most of the studies investigated labour management and

[1] This is a review with several studies all implementing different guidelines. The review does not report details of the guidelines implemented.

medical interventions in peri-partum care, particularly Caesarean procedures. Second opinion, considered to be an audit-type intervention, was effective in reducing emergency Caesarean rates but had no effect on elective Caesarean rates. One study showed no significant difference in vaginal birth after Caesarean rates between control and audit groups. Feedback quality was high for all but one of the studies.(5)

A fourth poor quality review identified ten primary studies evaluating the effects of audit and feedback, all of which reported improvements in care. The targeted behaviour was general management in three studies, prevention services in three studies, test ordering in three studies and discharge planning in one study. The effects were modest, with a median absolute effect on improved performance of +7% (range +1.3 to +16.0%) obtained from five cluster RCTs.(12)

In a fifth poor quality review, 37 of 45 (82.2%) studies reported significant improvements in guideline dissemination and implementation when audit and feedback processes (no detail provided) were used. However, the authors stated that it is not possible to determine whether this audit and feedback were directly responsible for the findings.(14)

Two poor quality reviews identified one study each investigating audit and feedback for implementing arthritis guidelines (6) and chronic disease guidelines.(11) One review identified an RCT comparing the effectiveness of two different kinds of feedback to implement national guidelines on prescribing for asthma in Denmark.(6) One group of GPs received detailed feedback with patient-level data, while the second group received feedback displaying aggregated data at practice level. A third group acted as control and did not receive any feedback. The study found no difference between the two methods, nor did it find that feedback (no further details provided) was more effective than the control.(11) The second review investigating osteoarthritis and rheumatoid arthritis guidelines identified one study reporting no evidence of statistical differences in the use and monitoring of cytoprotective agents between intervention and control groups.(6)

2.6 Evidence statement: Audit and feedback for guideline implementation

There is moderate evidence from one overview of systematic reviews[1] and moderate evidence from six systematic reviews[2,3,4,5,6,7] about the effectiveness of audit and feedback for increasing guideline uptake. An overview of systematic reviews reported moderate evidence of effectiveness of audit and feedback; eight of 18 included systematic reviews reported positive findings, while ten reported unclear findings. Four reviews reported moderate evidence that audit and feedback were effective[2,4,6,7] with the majority of included studies reporting positive findings. Two reviews (identifying one RCT each) reported no evidence that audit and feedback were effective.[3,5.]

[1] Prior *et al.,* 2008
[2] Chaillet *et al.,* 2006
[3] Lineker and Husted, 2010
[4] Okelo *et al.,* 2013
[5] Brusamento *et al.,* 2012
[6] Grimshaw *et al.,* 2004
[7] Medves *et al.,* 2010

3.4.5 Opinion Leader

Three reviews investigated the use of opinion leaders, which was generally defined as the use of information providers nominated by their colleagues as 'educationally influential'.(5, 14, 15)

A poor quality overview of systematic reviews identified eleven reviews reporting this outcome. Seven systematic reviews reported positive findings (ranging from 0% to 39% improvement in process or compliance) and four reported unclear findings.(15)

In one poor quality review, thirteen of the sixteen (81.3%) identified studies reported significant findings in favour of opinion leaders. However, the authors stated that it was not possible to determine whether these leaders were directly responsible for the findings.(14)

Another poor quality review investigating the implementation of obstetric guidelines identified two primary studies.(5) Interventions based on an opinion leader were found to have mixed effects. One study found that this strategy was ineffective in improving breastfeeding rates. The other study demonstrated the relative efficacy of the opinion leader strategy, but the impact on Caesarean delivery rates was limited (significant odds ratio, but non-significant adjusted risk ratio for baseline imbalance). Opinion leaders appeared to be more effective in changing the physicians' behaviours rather than the patients' behaviours.(5)

2.7 Evidence statement: Opinion leaders for guideline implementation

There is mixed evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] on the effectiveness of opinion leaders for increasing guideline uptake. All included overviews and systematic reviews reported mixed findings with both effective and ineffective results. All reviews were of poor quality.

[1] Prior *et al.,* 2008
[2] Chaillet *et al.,* 2006
[3] Medves *et al.,* 2010

3.4.6 Patient Mediated strategies

Three reviews investigated the use of patient mediated strategies, most of which were targeted at preventative services.(12, 14, 15) An overview of reviews defined patient-specific interventions as interventions designed to influence practitioner behaviour via information provided to patients.(15) Two reviews defined patient mediated strategies using the taxonomy defined by Effective Practice and Organisation of Care (EPOC) as those in which new clinical information (not previously available) was collected directly from patients and given to the provider, for example, depression scores from an instrument. This new information in turn has an effect on the timing of the intervention. (12, 14)

A poor quality overview of systematic reviews identified nine reviews reporting patient mediated strategies for guideline implementation (no further information reported). Five

systematic reviews reported positive findings (ranging from a reduction of -9% to 64% improvement in process or compliance), while four reported unclear or inconclusive findings: no further detail reported.(15)

One poor quality review compared patient mediated dissemination with a no intervention control and identified seven studies, all of which observed improvements in care. The effects were moderate to large, with a median absolute effect of +25% in 3 cluster-RCTs and +1% in patient-RCTs.(12)

Another poor quality review identified fourteen primary studies, nine of which (64.3%) reported significant findings. However, the authors stated that it was not possible to determine whether these interventions were directly responsible for the findings.(14)

2.8 Evidence statement: Patient mediated strategies for guideline implementation

There is mixed evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] on the effectiveness of patient mediated strategies for increasing guideline uptake where patient-mediated strategies were defined as new clinical information (not previously available) which was collected directly from patients and given to the provider. An overview of systematic reviews reported mixed findings with five included reviews reporting positive findings and four reviews reporting inconclusive findings.[1.] In this overview of reviews, patient-mediated strategies were defined as interventions designed to influence practitioner behaviour via information provided to patients. Two reviews reported that the majority of their included studies showed benefits in employing patient mediated strategies for guideline uptake; however all included reviews were of poor quality and in most cases the components of the patient mediated strategies were not reported.[2,3.]

[1] Prior *et al.,* 2008
[2] Grimshaw *et al.,* 2004
[3] Medves *et al.,* 2010

3.4.7 Reminders

Four reviews investigated the use of reminders. Reminders included the use of patient or encounter-specific information, provided verbally, on paper or on a computer screen, designed or intended to prompt a health professional to recall information and remind them to perform or avoid some action to aid individual patient care. The majority of reminders were patient specific and could be electronic pop-ups that appear on the computer screen when a chart is opened or could be a paper reminder placed in the patient's chart, such as a pharmacist's note advising clinicians that a patient requires blood tests to ensure toxicity is not an issue with a drug, or that a particular medication may be better for a patient (based on best evidence), (5, 12, 14, 15).

A poor quality overview of systematic reviews identified twenty systematic reviews reporting on reminder strategies for guideline implementation. Fifteen systematic reviews presented positive findings (ranging from 0% to 56% improvement) and five reported unclear or inconclusive findings.(15) One meta-analysis found that computer-delivered reminders in an ambulatory care setting significantly improved practice. However, despite this positive

impact on clinical process and compliance, the use of computer-based systems reportedly increased consultation times by up to 90 seconds. Moreover, the stress of using computer-based systems reduced clinician satisfaction.

One poor quality review investigating obstetric guidelines identified two primary studies and found that reminder strategies were generally effective.(5) Computerised reminders (recipients not described) significantly reduced Caesarean delivery rates in five hospitals in Canada. Computer-based information systems or paper reminders are clinical decision support systems used to integrate clinical and patient information to provide support for decision-making in patient care. This strategy allows the clinician to access the latest evidence and adapted directives to improve the quality of their own practice in real time. Paper reminders helped to reduce the number of antenatal visits in 53 centres in Argentina, Cuba, Saudi Arabia, and Thailand without increasing maternal or perinatal morbidity. For each centre, the reminder strategy was established and developed after the identification and comprehension of factors contributing to physicians' behaviour change.(5)

Another poor quality review compared reminders (recipients not reported) to a no intervention control and identified 38 studies implementing a variety of guidelines. The effects were moderate with a median absolute improvement in performance of 14.1%. Improvement in process measures was found in 28 of 33 studies.(12)

In a third poor quality review, 24 of 28 (85.7%) studies reported significant findings for reminders made to health care professionals (no further details provided). However, the authors stated that it was not possible to determine whether the reminders were directly responsible for the findings.(14)

2.9 Evidence statement: Reminders for guideline implementation

There is moderate evidence from one overview of systematic reviews[1] and three systematic reviews[2,3,4] on the effectiveness of reminders for increasing guideline uptake. An overview of systematic reviews reported that 75% of included reviews showed positive findings.[1.] Three further systematic reviews support this finding.[2,3,4.] Reminders were provided verbally, on paper or on a computer screen.

[1] Prior *et al.,* 2008
[2] Chaillet *et al.,* 2006
[3] Grimshaw *et al.,* 2004
[4] Medves *et al.,* 2010

3.4.8 Multifaceted Interventions

Eight reviews investigated the use of multifaceted intervention strategies involving the use of more than one implementation strategy.(5, 7-9, 11, 12, 15, 18)

Two poor quality overviews of systematic reviews were included.(15, 18) One review identified 16 systematic reviews reporting this outcome; 13 systematic reviews reported

positive findings (ranging from 0% to 60% improvement), while three reported unclear or inconclusive findings.(15) The other overview identified six systematic reviews. One review (Grimshaw (12)), which is included separately in this section, concluded that there was no evidence that multifaceted interventions were more effective than single intervention strategies. However, five other included reviews contradicted this conclusion and stated that multifaceted and intensive strategies were more effective than single interventions.(18)

One poor quality review investigated the implementation of multifaceted strategies, the majority of which involved GPs. (11) Six primary studies showed no effectiveness; two studies fully achieved their expected outcomes; two studies achieved most of their outcomes; and four strategies were partially effective. It was not possible to pinpoint intervention or strategy elements that were clearly effective when compared with others given the multiplicity of combinations. All studies involved voluntary trial recruitment, thus potentially limiting external validity as more motivated physicians may have self-selected themselves to participate.(11)

Another poor quality review investigating obstetric guidelines reported outcomes for multifaceted interventions (based on several sub interventions such as guideline education, opinion leaders, academic detailing, audit and feedback, reminders, physician and hospital payment, and malpractice reform) in nine primary studies.(5) All of the primary studies found that multifaceted interventions were effective and demonstrated a high efficacy for changing behaviours.(5)

One moderate quality review investigating asthma guidelines suggested there was insufficient evidence to assess the effect of multifaceted interventions on clinical outcomes in seven primary studies.(7) All interventions included information, education, and at least two of the following; organisational change, decision support, and feedback and audit. Three studies of low strength evidence found a significant increase in prescribing practices (25% to 49%) but no significant effects were identified in the remaining studies. Six studies of low strength evidence found moderate effects on action plans. Provision increased from 27% to 46% in observational studies, but smaller effect sizes were observed in RCTs (7% of providers, relative risk 1.82).(7)

Another poor quality review investigating community acquired pneumonia guidelines reported outcomes for the implementation (detail not reported) of multifaceted strategies from six primary studies.(8) All six studies reported significant improvements in at least one process measure: hospital admission rates for low risk patients (one study), time until administration of first antibiotic (two studies), use of guideline recommended antibiotics (one study) and use of appropriate monotherapy and a shorter duration of intravenous therapy (one study). Two studies reported reductions in length of stay or bed days, and one study reported a significant reduction in mortality when patients received treatment according to the guidelines. However, three other studies reported no difference in length of stay, bed days or mortality between patient groups.(8)

A poor quality review (9) investigating multifaceted interventions for the uptake of physiotherapy guidelines identified two primary studies. One trial of whiplash guidelines

(20), compared the effect of an interactive educational meeting administered by opinion leaders (8 hours) followed by an educational outreach visit (2 hours) versus dissemination of the guideline only, six months later. The meetings included interactive sessions, practical sessions, and problem solving. The second trial of low back pain guidelines compared the effect of two interactive educational meetings administered by experts (2.5 hours each over 4 weeks) versus dissemination of the guideline only, 12 months later. The meetings included didactic lectures, discussion, role playing, feedback, and reminders. The trials suggested that limiting the number of sessions, using functional outcome measures, using mainly active interventions, giving adequate information, reassuring patients, advising patients to act as usual, increasing patients' activity levels, and changing attitudes/beliefs on pain can improve some areas of professional practice. Neither study found evidence that they influenced patient health outcomes or cost of care.(9)

One poor quality review investigated 68 combinations of interventions against a no intervention control group and 55 head-to-head combinations of interventions.(12) It was difficult to draw generalisable conclusions from the large number of combinations.(12) Across all combinations, multifaceted interventions did not appear to be more effective than single interventions and the effects of multifaceted interventions did not appear to increase with the number of component interventions. Among the most commonly studied multifaceted interventions, those with educational outreach had a median absolute improvement in performance of 6.0% in 13 cluster RCTs.(12)

2.10 Evidence statement: Multifaceted interventions for guideline implementation

There is moderate evidence from two overviews of systematic reviews[1,2] and six systematic reviews[3,4,5,6,7,8] on the effectiveness of multifaceted interventions for increasing guideline uptake. The overviews reported that a combined total of 18 of the 22 included studies showed that multifaceted and intensive strategies were more effective than single interventions[1,2.]

There is mixed evidence from six systematic reviews about the effectiveness of multifaceted interventions; each primary study within the reviews used a different number and type of intervention components so it is not possible to report which components are most effective in combination. Four systematic reviews reported improvements in guideline uptake using multifaceted interventions[3,4,5,6]; one review reported mixed findings[7] and one review reported ineffective findings.[8]

[1] Prior *et al.,* 2008
[2] Francke *et al.,* 2008
[3] Chaillet *et al.,* 2006
[4] Okelo *et al.,* 2013
[5] Simpson *et al.,* 2005
[6] van der Wees *et al.,* 2008
[7] Brusamento *et al.,* 2012
[8] Grimshaw *et al.,* 2004

3.4.9 Organisational Intervention

Three reviews investigated the use of organisational interventions such as restructuring clinics and involving additional staff.(7, 14, 15)

An overview of systematic reviews identified one systematic review that had investigated organisational interventions. This review reported ineffective findings, with effect sizes ranging from -16% to 2% improvement in process or compliance.(15)

A moderate quality review investigating the implementation of asthma guidelines provided low strength evidence suggesting that organisational change does not reduce emergency department (ED) visits (4 studies) or missed school days (one RCT).(7) One of the studies restructured asthma care visits, while the remaining three studies utilized supplemental trained personnel as part of the intervention. Three of the studies also incorporated an educational component provided to health care providers.Two studies indicated that organisational change can increase provider prescriptions, but the effect was small (8 to 16%). Two studies (low strength evidence) indicated that organisational change could increase action plan use by providers (moderate effect ranging from 10 to 14%).(7)

A poor quality review assessed a number of organisational interventions to improve implementation: revision of professional roles, clinical multidisciplinary teams, continuity of care, and communication and case discussion among distant health professionals.(14) For changes in roles, studies were heterogeneous and no conclusions were reached. All studies utilised multidisciplinary teams and eight studies had continuity of care plans. The authors did not state any conclusions. Three studies of communication over distance reported significant changes in knowledge or practice or outcomes.(14)

2.11 Evidence statement: Organisational change for guideline implementation

There is limited evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] regarding the effectiveness of organisational change. No review suggested that organisational change was an effective intervention to increase guideline uptake.

[1] Prior *et al.,* 2008
[2] Okelo *et al.,* 2013
[3] Medves *et al.,* 2010

3.5 FACTORS INFLUENCING IMPLEMENTATION

All reviews reported in this section were assessed to be of poor quality.

3.5.1 Characteristics of the Guidelines

Four reviews investigated characteristics of the guidelines themselves that were thought to influence implementation.(8, 10, 17, 18)

One overview of systematic reviews reported that the most frequently described guideline characteristic concerns complexity. Guidelines that are easy to understand, can easily be tried out, and do not require specific resources have a greater chance of being used. Other influential guideline characteristics described were that adherence to evidence based guidelines appears to be higher than is the case for guidelines lacking a clear scientific base; that when guidelines are developed by the target group (of health professionals) and experts, this enhances the chance of successful implementation. All of the included systematic reviews were of poor quality.(18)

A poor quality review suggested five attributes of well implemented guidelines:

- Relative advantage: is complying with the guideline superior to not complying with it in terms of its effectiveness and cost-effectiveness?
- Compatibility: is the guideline consistent with clinicians' values, norms, and perceived needs?
- Complexity: How easy is it to integrate the guideline into the current work practice?
- Trialability: Can the clinician test or try this guideline with relative ease?
- Observability: can the clinician observe other clinicians that have incorporated the new guideline easily? (10)

Another poor quality review suggested that complexity, user unfriendliness, limited accessibility, discordance between guidelines and lack of local ownership were barriers to implementation. (8)

A poor quality review reported that 41 studies identified the nature of the guideline itself or the evidence as barriers; no further details were reported. (17)

2.12 Evidence statement: Characteristics of guidelines thought to influence implementation

There is limited evidence from one overview of systematic reviews[1] and three systematic reviews[2,3,4] regarding characteristics of guidelines thought to influence implementation. Complexity, user unfriendliness, limited accessibility, trialability*, discordance between guidelines, and lack of local ownership were suggested as barriers to implementation.[5,3,2] An overview of systematic reviews also reported that guidelines that do not require specific resources have a greater chance of implementation.[1]

[1] Francke *et al.,* 2008
[2] Gurses *et al.,* 2010
[3] Simpson *et al.,* 2005
[4] Cochrane *et al.,* 2007
[5] Okelo *et al.,* 2013

*Trialability was defined in terms of a question: Can the clinician test or try this guideline with relative ease? (Gurses 2010)

3.5.2 Characteristics of Professionals

Four reviews investigated characteristics of professionals that were thought to influence implementation.(8, 10, 17, 18)

One overview of systematic reviews reported six studies that described characteristics of physicians in relation to the adoption of clinical guidelines. Four reviews concluded that a lack of awareness, limited familiarity and a lack of agreement with guidelines are the main barriers to guideline adoption. Three reviews mentioned physicians' age and/or experience as determinants and suggested that young or less experienced professionals would be more inclined to use guidelines than older, more experienced professionals. (18)

A poor quality review reported that 62 studies identified barriers such as professional characteristics, maturity of practice, legal concerns, boundaries or peer influence; no further details were reported. (17).

Another poor quality systematic review that aimed to develop a conceptual framework that can provide a guide for designing effective interventions reported that their findings were contradictory; no single conceptual model identified the clinician characteristics that affected compliance. One model suggested that awareness and familiarity with the guideline and practice inertia were important factors; the other model identified normative beliefs and subjective norms as being important. (10)
Another poor quality review assessing pneumonia guidelines reported that lack of physician awareness or agreement, a conservative attitude and being more experienced and legal concerns were barriers; no further details were reported. (8)

2.13 Evidence statement: Characteristics of professionals thought to influence implementation

There is limited evidence from one overview of systematic reviews[1] and three systematic reviews[2,3,4] regarding characteristics of professionals thought to influence implementation. Lack of physician awareness of, or agreement with guidelines, conservative attitude, and greater experience of treating community acquired pneumonia and legal concerns were thought to be barriers to implementation.[2,3,4,1.]

[1] Francke *et al.,* 2008
[2] Simpson *et al.,* 2005
[3] Gurses *et al.,* 2010
[4] Cochrane *et al.,* 2007

3.5.3 Characteristics of Patients

Three reviews investigated characteristics of patients that were thought to influence implementation.(8, 17, 18)

One overview of systematic reviews reported four reviews of poor methodological quality. One review concluded that patient-related characteristics may include the fact that some patients perceive no need for guideline recommendations or may even resist them. Two further reviews also described patients' resistance towards the recommendations as a factor

negatively affecting the adoption of clinical guidelines. One review referred to patients with co-morbidity as a group for whom there is a greater chance that professionals will not adhere to guidelines. (18)

A poor quality review reported that 31 studies identified barriers such as patient characteristics, attitudes, knowledge or behaviours such as adherence; no further details were reported. (17).

Another poor quality review assessing pneumonia guidelines reported that severe pneumonia and comorbidities, non-clinical patient factors (e.g. patient demands) and older age (>65 years) are all barriers to guideline uptake; no further details were reported. (8)

2.14 Evidence statement: Characteristics of patients thought to influence implementation

There is limited evidence from one overview of systematic reviews[1] and two systematic reviews[2,3] regarding characteristics of patients thought to influence implementation. Overall, patient attitudes, knowledge, or behaviours (such as adherence) were all thought to influence implementation. These reviews also suggested that co-morbidities reduced the chance that guidelines are followed.[2,3,1.]

[1] Francke *et al.,* 2008
[2] Simpson *et al.,* 2005
[3] Cochrane *et al.,* 2007

3.5.4 Characteristics of the Environment

Two reviews investigated characteristics of the environment that were thought to influence implementation.(8, 18) One review investigating guidelines for community acquired pneumonia suggested that limited time, personnel and resources devoted to support guideline adherence, and high workload were barriers to implementation.(8) The other suggested that lack of support from peers or superiors (4 studies) as well as insufficient staff and time (4 studies) were the main impediments to guideline implementation.(18)

2.15 Evidence statement: Characteristics of the environment thought to influence implementation

There is limited evidence from one overview of systematic reviews[1] and one systematic review[2,3] regarding characteristics of the environment thought to influence implementation. The overview of systematic reviews suggested that lack of support from peers or superiors as well as insufficient staff and time were the main barriers to implementation[1], while the additional systematic review suggested that limited time, personnel and resources devoted to support guideline adherence and high workload were barriers.[2]

[1] Francke *et al.,* 2008
[2] Simpson *et al.,* 2005
[3] Cochrane *et al.,* 2007

3.6 BARRIERS TO IMPLEMENTATION

Two reviews investigated barriers to implementation.(10, 17)

One review, which aimed to assess the barriers to health care provider adherence of guidelines, diffusion of innovation and implementation of evidence into practice, identified 256 primary studies related to a variety of different types of guidelines.(17) 65 studies identified lack of knowledge (deficiencies in information), awareness or skill as barriers. 58 studies identified lack of professional efficacy (belief in ability to perform and confidence in one's ability), authority, outcome expectancy or accurate self-assessment (many professionals believed they were performing to a standard but such performance was not found on testing) as barriers. 69 studies identified lack of material support, resources, funding, or time as major barriers. 62 studies reported lack of organisational, system, referral, work or team structures, or processes as the reason for inability to implement guidelines or evidence.

A second review investigating infection guidelines suggested factors that affect clinicians' compliance with evidence-based guidelines and assessed 'system characteristics' that might influence compliance.(10) This includes task, physical environment and organisational characteristics and tools/technologies. The authors' model suggested that task, expectation, responsibility and method ambiguity influenced compliance.

2.16 Evidence statement: Barriers to implementation

There is limited evidence from two systematic reviews[1,2] regarding barriers to implementation. One review suggested that system characteristics such as the physical environment and organizational characteristics were barriers to implementation.[1]. The other review reported that lack of knowledge, awareness or skill, personal efficacy and lack of resources were barriers to implementation.[2]

[1] Gurses *et al.,* 2010
[2] Cochrane *et al.,* 2007

Section 4: Summary and Discussion

4.1 SUMMARY OF KEY FINDINGS

Fifteen systematic reviews, including two overviews of systematic reviews, were identified.

The most commonly reported outcome across the systematic reviews was the use of multifaceted intervention strategies (eight reviews). Two overviews of reviews reported the effectiveness of multifaceted interventions compared to single interventions, and this was generally supported by the other reviews identified. Evidence also supported the use of reminders as a strategy to promote guideline uptake. An overview of systematic reviews reported that fifteen of twenty reviews reported positive findings. Two additional systematic reviews also reported positive findings and suggested that reminders are likely to be an effective strategy for supporting the uptake of guidelines. In terms of educational strategies, educational meetings (such as conferences) and continuing education, strategies did not appear to have an effect on the uptake of guidelines, although educational outreach visits may be beneficial.

Three additional interventions had conflicting findings: computerised decision support systems, opinion leaders, and patient mediated interventions. However, the weight of evidence appeared to favour a beneficial effect. It is likely that any improvements in guideline uptake using these intervention strategies will be small.

Seven reviews on different types of guidelines investigated the use of audit and feedback strategies. It is not clear whether audit and feedback strategies were beneficial in promoting the uptake of guidelines: some reviews reported improvements, while others reported unclear findings. The reviews reporting improvements did not report statistical effect sizes, so it is difficult to estimate the extent of these improvements. Evidence was also conflicting for mailed dissemination of guidelines, and no conclusions could be drawn about the usefulness of this strategy for promoting guideline uptake.

Four reviews investigated characteristics of the guidelines, the health professionals and the patients that were thought to influence guideline implementation. Four reviews investigated characteristics of the guidelines themselves that were thought to influence implementation. Complexity, user unfriendliness, limited accessibility, trialability, discordance between guidelines, and lack of local ownership were suggested as barriers to implementation. One review also suggested that guidelines that do not require specific resources have a greater chance of implementation.

Four reviews investigated characteristics of professionals that were thought to influence implementation. Lack of physician awareness of guidelines or agreement with guidelines, conservative attitude, and greater experience of treating community acquired pneumonia and legal concerns were thought to be barriers to implementation.

Three reviews investigated characteristics of patients that were thought to influence implementation. Patients' attitudes, knowledge, or behaviours such as adherence were all thought to influence implementation. These reviews also suggested that co-morbidities reduced the chance that guidelines are followed.

4.2 OVERVIEWS OF REVIEWS AND REVIEWS

This review of reviews included both overviews of reviews and reviews. This has led to some risk of double counting of primary studies and of reviews, whose extent could not be assessed in the available resources. For example, Grimshaw's review (12) appears in the Franke overview (13). We included large overviews because we felt they might provide a helpful summary of the evidence reviews for topics not covered by individual reviews, some of which were focused on single conditions or primary care. We also felt anticipated, given the highly selective nature of our review of reviews, that a large overview might provide a useful perspective to counter-balance the findings from single more focused reviews.

4.3 QUALITY OF THE INCLUDED SYSTEMATIC REVIEWS

Overall, the quality of the included overviews and systematic reviews was poor. Only one of the 15 included reviews was assessed as being of adequate quality by achieving more than half of the eleven AMSTAR criteria. The other fourteen reviews were assessed as being of poor quality. The poor quality of the reviews, in terms of their performance against the AMSTAR criteria, limits our ability to draw confident conclusions for any of the reported guideline dissemination and uptake strategies. None of the reviews evaluated publication bias and this does not provide confidence that the majority of relevant studies will have been identified.

Given these limitations, the findings of this overview should be considered as indicative only, although it does highlight the need for better reported and possibly better specified systematic reviews. The publication of very large scale reviews in peer-reviewed journals (four reviews included over 70 studies and two reviews included over 230 studies) is problematic. The restrictions in publication length resulting from journal publication may have led to the exclusion of key details that might have contributed to raising the quality of the reviews, for example, reviews might have been unable to provide tables of included studies because of word restrictions.

4.4 LIMITATIONS

This review of reviews was carried out as systematically as possible, with a priori inclusion criteria to minimise bias in the review process. The searches were limited to reviews published in 2003 or later. However, many of the primary studies in the included reviews were published earlier than this date, so this review of reviews provides an overview of research over a longer time frame.

One of the important limitations of this report is that we did not retrieve the included primary studies. Thus, we were unable to carry out a detailed assessment of their quality, or extract further data when information was not provided in the review reports. In addition, we did not investigate the overlap between primary studies included in the systematic reviews, which means that some primary studies may have been double-counted.

The studies that assessed 'barriers' and 'attitudes' did not involve interventions or comparators. Often these studies did not base their results on quantitative data and used various theories to link their findings; the reliability of these conclusions is therefore unknown.

4.5 VARIABLES AFFECTING DATA ANALYSIS

The reporting of the included reviews varied widely: some reviews provided detailed data on intervention content, implementation, context and population, while others provided very little detail. There appears to be a reasonable degree of heterogeneity in how review authors defined and categorised the interventions they investigated, which, combined with the lack of detail on intervention content, makes it difficult to draw comprehensive conclusions.

4.6 GAPS IN THE EVIDENCE (AS DESCRIBED BY REVIEW AUTHORS)

The included reviews generally agreed that there were too few rigorous studies assessing the effectiveness of different approaches to implementing clinical guidelines and that better quality studies should be conducted. Some authors reported that more specific meta-analyses would be helpful and that there was a need to understand better the active components of interventions and how they were contributing to guideline uptake.

4.7 CONCLUSIONS

We identified fifteen systematic reviews, the majority of which were of poor methodological quality. The two overviews of reviews included in this report came to similar conclusions. One overview concluded that there was convincing evidence for the use of multifaceted interventions (involving strategies such as educational strategies, audit and feedback, opinion leaders, quality improvement strategies, academic detailing, reminders), interactive education and clinical reminder systems for effective implementation of clinical guidelines(15), while the other overview concluded that multiple strategies appear to be more effective than single interventions in implementing guidelines.(18) Both overviews mentioned the lack of good quality evidence about guideline implementation.

A range of characteristics of guidelines, health care professionals and the working environment were suggested to influence implementation negatively but only low-resource requirements was identified as potentially enhancing implementation. Complexity, user unfriendliness, limited accessibility, trialability, discordance between guidelines, and lack of

local ownership were suggested as barriers to implementation. Lack of physician awareness of guidelines or agreement with guidelines, a conservative attitude, and greater experience of treating community acquired pneumonia and legal concerns were thought to be barriers to implementation. Patients' attitudes, knowledge, or behaviours such as adherence were all thought to influence implementation. These reviews also suggested that co-morbidities reduced the chance that guidelines are followed.

The included reviews reported the availability of few rigorous studies assessing the effectiveness of different approaches to implementing clinical guidelines and recommended better quality studies should be conducted. Some authors reported that there was a need to understand better the active components of interventions and how they were contributing to guideline uptake. Given the pragmatic nature of this review and the quality of the reviews, any findings from this overview of systematic reviews should be considered as indicative only.

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APPENDIX A

PRISMA Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	Cover sheet
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	Executive summary
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	Section 1.2 Background
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	Section 1.1 Objectives
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	Protocol available – can be made available on YHEC website if agreed.
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	Section 2.1 Research question
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	Section 2.2 and Appendix B

Section/topic	#	Checklist item	Reported on page #
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	Section 2.2 and Appendix C
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	Section 2.3
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	Section 2.5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	Section 2.5 summary.
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	Section 2.4
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	Section 2.6
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	Section 2.6
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	Section 2.6
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	Section 2.6
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	Section 3.1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Section 3.2
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Section 3.3

Section/topic	#	Checklist item	Reported on page #
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Section 4.1
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	Section 4.1 and 4.2
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	Section 4.1 and 4.2
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	Section 4.1 and 4.2
DISCUSSION			
Summary of evidence	24	Summarise the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	Section 5.1, 5.2, 5.3 and 5.4
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	Section 5.1, 5.2, 5.3 and 5.4
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	Section 5.5
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	Section 1.2

APPENDIX B

Search Strategies

A.1 Cochrane Library searched 25/11/13

ID	Search	Hits
#1	MeSH descriptor: [Guidelines as Topic] explode all trees	1863
#2	MeSH descriptor: [Guideline] explode all trees	17
#3	MeSH descriptor: [Clinical Protocols] this term only	1652
#4	MeSH descriptor: [Critical Pathways] this term only	238
#5	MeSH descriptor: [Consensus] this term only	31
#6	MeSH descriptor: [Health Planning Guidelines] this term only	30
#7	(implement* or aware* or uptake or up-take or takeup or take-up or adhere or adhered or adherence or concordance or accordance or adopt* or comply or complies or compliance or disseminat* or spread or spreading or barrier or barriers or facilitat*):ti,ab,kw	57391
#8	(#1 or #2 or #3 or #4 or #5 or #6) and #7	1188
#9	((guideline* or guidance* or recommended or recommendation* or advised or advice or standard or standards or statement* or consensus or policy or policies or protocol* or framework* or frame-work*) near/10 (implement* or aware* or uptake or up-take or takeup or take-up or adhere or adhered or adherence or concordance or accordance or adopt* or comply or complies or compliance or complying or disseminat* or spread or spreading or barrier or barriers or facilitat*)):ti,ab,kw	5693
#10	MeSH descriptor: [Health Plan Implementation] this term only	73
#11	MeSH descriptor: [Guideline Adherence] this term only	604
#12	#9 or #10 or #11	5741
#13	#12 or #8	6154
#14	#13 in Cochrane Reviews (Reviews and Protocols), Other Reviews and Technology Assessments	264

Health Technology Assessment Database: Issue 4 of 4, October 2013 37 results
Database of Abstracts of Reviews of Effects: Issue 4 of 4, October 2013 61 results
Cochrane Database of Systematic Reviews: Issue 11 of 12, November 2013 166 results

A.2 McMASTER searched 25/11/13

A series of searches were undertaken as follows.

(implement OR implements OR implementation OR implementing OR implemented OR aware OR awareness OR uptake OR up-take OR takeup OR take-up OR adhere OR adhered OR adherence OR concordance OR accordance OR adopt OR adopting OR adopted OR adoption OR comply OR complies OR compliance OR complying OR disseminate OR disseminates OR dissemination OR spread OR spreading OR barrier OR barriers OR facilitate OR facilitates OR facilitating OR facilitation) AND (guideline OR guidelines OR guidance)

34 results

20 added to Endnote

14 duplicate records.

(implement OR implements OR implementation OR implementing OR implemented OR aware OR awareness OR uptake OR up-take OR takeup OR take-up OR adhere OR adhered OR adherence OR concordance OR accordance OR adopt OR adopting OR adopted OR adoption OR comply OR complies OR compliance OR complying OR disseminate OR disseminates OR dissemination OR spread OR spreading OR barrier OR barriers OR facilitate OR facilitates OR facilitating OR facilitation) AND (recommended OR recommendation OR recommendations)

0 results

(implement OR implements OR implementation OR implementing OR implemented OR aware OR awareness OR uptake OR up-take OR takeup OR take-up OR adhere OR adhered OR adherence OR concordance OR accordance OR adopt OR adopting OR adopted OR adoption OR comply OR complies OR compliance OR complying OR disseminate OR disseminates OR dissemination OR spread OR spreading OR barrier OR barriers OR facilitate OR facilitates OR facilitating OR facilitation) AND (advised OR advice OR standard OR standards OR statement OR statements)

3 results

1 added to EndNote

2 duplicates

(implement OR implements OR implementation OR implementing OR implemented OR aware OR awareness OR uptake OR up-take OR takeup OR take-up OR adhere OR adhered OR adherence OR concordance OR accordance OR adopt OR adopting OR adopted OR adoption OR comply OR complies OR compliance OR complying OR disseminate OR disseminates OR dissemination OR spread OR spreading OR barrier OR barriers OR facilitate OR facilitates OR facilitating OR facilitation) AND (consensus OR policy OR policies OR protocol OR protocols OR framework OR frameworks OR frame-work OR frameworks)

12 results

8 added to EndNote

4 dupes

A.3 Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) <1946 to Present> Searched 26/11/13

1 exp Guidelines as Topic/ (114803)
2 exp Guideline/ (25384)
3 Clinical Protocols/ (20591)
4 Critical Pathways/ (4562)
5 Consensus/ (4897)
6 Health Planning Guidelines/ (4011)
7 (implement$ or aware$ or uptake or up-take or takeup or take-up or adhere or adhered or adherence or concordance or accordance or adopt$ or comply or complies or compliance or disseminat$ or spread or spreading or barrier$1 or facilitat$).ti. (238992)
8 or/1-6 (168693)
9 7 and 8 (6733)

10 ((guideline$1 or guidance$ or recommended or recommendation$1 or advised or advice or standard$1 or statement$1 or consensus or policy or policies or protocol$1 or framework$1 or frame-work$1) adj10 (implement$ or aware$ or uptake or up-take or takeup or take-up or adhere or adhered or adherence or concordance or accordance or adopt$ or comply or complies or compliance or complying or disseminat$ or spread or spreading or barrier$1 or facilitat$)).ti. (9404)
11 Health Plan Implementation/ (4023)
12 Guideline Adherence/ (20788)
13 or/10-12 (31113)
14 9 or 13 (33149)
15 systematic$ review$.ti,ab. (56379)
16 meta-analysis as topic/ (14174)
17 meta-analytic$.ti,ab. (3728)
18 meta-analysis.ti,ab,pt. (73423)
19 metanalysis.ti,ab. (128)
20 metaanalysis.ti,ab. (1094)
21 meta-synthesis.ti,ab. (207)
22 metasynthesis.ti,ab. (113)
23 meta-regression.ti,ab. (2358)
24 metaregression.ti,ab. (286)
25 pooled analys#s.ti,ab. (4587)
26 (synthes$ adj3 literature).ti,ab. (1399)
27 (synthes$ adj3 evidence).ti,ab. (4053)
28 integrative review.ti,ab. (818)
29 data synthesis.ti,ab. (7566)
30 (research synthesis or narrative synthesis).ti,ab. (747)
31 (systematic study or systematic studies).ti,ab. (7702)
32 (systematic comparison$ or systematic overview$).ti,ab. (1960)
33 evidence based review.ti,ab. (1291)
34 comprehensive review.ti,ab. (6745)
35 critical review.ti,ab. (10993)
36 quantitative review.ti,ab. (476)
37 structured review.ti,ab. (480)
38 realist review.ti,ab. (56)
39 realist synthesis.ti,ab. (32)
40 review.pt. (1922282)
41 medline.ab. (63738)
42 pubmed.ab. (30204)
43 cochrane.ab. (37093)
44 embase.ab. (33673)
45 cinahl.ab. (11829)
46 psyc?lit.ab. (1217)
47 psyc?info.ab. (12142)
48 (literature adj3 search$).ab. (25811)
49 (database$ adj3 search$).ab. (25175)
50 (bibliographic adj3 search$).ab. (1300)
51 (electronic adj3 search$).ab. (9327)
52 (electronic adj3 database$).ab. (10819)
53 (computeri?ed adj3 search$).ab. (2819)
54 (internet adj3 search$).ab. (1808)
55 included studies.ab. (7632)
56 (inclusion adj3 studies).ab. (6903)
57 inclusion criteria.ab. (36377)
58 selection criteria.ab. (27357)
59 predefined criteria.ab. (1095)

60 predetermined criteria.ab. (764)
61 (assess$ adj3 (quality or validity)).ab. (44136)
62 (select$ adj3 (study or studies)).ab. (38965)
63 (data adj3 extract$).ab. (34348)
64 extracted data.ab. (9403)
65 (data adj2 abstracted).ab. (3582)
66 (data adj3 abstraction).ab. (928)
67 published intervention$.ab. (108)
68 ((study or studies) adj2 evaluat$).ab. (107472)
69 (intervention$ adj2 evaluat$).ab. (6362)
70 confidence interval$.ab. (231059)
71 heterogeneity.ab. (96954)
72 pooled.ab. (46504)
73 pooling.ab. (8169)
74 odds ratio$.ab. (151619)
75 (Jadad or coding).ab. (127443)
76 or/41-73 (654147)
77 40 and 76 (114588)
78 review.ti. (257654)
79 76 and 78 (44965)
80 (review$ adj4 (papers or trials or studies or evidence or intervention$ or evaluation$)).ti,ab. (107250)
81 or/15-39 (158326)
82 77 or 79 or 80 or 81 (288094)
83 14 and 82 (1185)
84 animals/ not humans/ (3970297)
85 (news or editorial or letter or comment or case reports).pt. (2978361)
86 83 not (84 or 85) (1152)
87 limit 86 to (english language and yr=2000 -Current) (1049)
88 remove duplicates from 87 (894)

A.4 International Guideline Library (http://www.g-i-n.net/library/international-guidelines-library) Searched 26/11/13

The following search strategy was undertaken.

implement* or aware* or uptake or up-take or takeup or take-up or adhere* or concordance or accordance or adopt* or comply or complies or compliance or complying or disseminat* or spread* or barrier* or facilitate*

Search all fields. English Only. Systematic Review only. 1 record was returned.

APPENDIX C

Excluded Systematic Reviews

Excluded systematic reviews

Reference	Reason for exclusion
Davies, P. et al. (2010). A systematic review of the use of theory in the design of guideline dissemination and implementation strategies and interpretation of the results of rigorous evaluations. Implementation Science **5**: 14.	The review investigated the use of theory in implementation research

APPENDIX D

Detailed Quality Assessment of the Included Systematic Reviews and Overviews

Included systematic reviews/overviews: detailed quality criteria and study risk of bias assessment

Brusamento, S., et al. (2012). Assessing the effectiveness of strategies to implement clinical guidelines for the management of chronic diseases at primary care level in EU Member States: a systematic review. Health Policy 107(2-3): 168-183.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Unclear	The purpose of the review was stated and inclusion/exclusion criteria were reported. The authors did not refer to a protocol, ethics approval or pre-determined/a priori published research objectives, but they did state that the review followed Cochrane methodology.
2. Was there duplicate study selection and data extraction?	Yes	Two pairs of authors independently screened citations against the inclusion criteria and extracted data from the selected studies. A third author resolved any disagreements during the screening and extraction process.
3. Was a comprehensive literature search performed?	No	Five electronic databases, including ClinicalTrials.gov and the EPPI-Centre database of health promotion research, were searched from 2000 to 2011. The search strategy was described in general, but no specific keywords and/or MESH terms were stated. The authors did not report supplementary sources of additional studies, such as reviewing the references in retrieved studies.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Unclear	Although searches were not restricted by language or publication type, only studies for which a full text could be obtained were included in the review. The authors commented that the fact that all of the studies included were in English may be attributable to the tendency for robust papers to be published in international, English-language journals as well as to fact that sometimes there is limited indexing of publications in other languages.
5. Was a list of studies (included and excluded) provided?	Unclear	Excluded studies and the reason for their exclusion were presented in a table. The included records (some studies had more than one publication) were not specifically listed; the range of corresponding reference numbers was given.
6. Were the characteristics of the included studies provided?	Unclear	Details of the methods, participants, interventions and outcomes in the included studies were tabulated according to whether the study reported a single intervention or a multi-faceted intervention. Some further study characteristics were reported in the text, e.g. study initiation time and duration of interventions, but generally the ranges of characteristics in all the studies analysed were not reported.
7. Was the scientific quality of the included studies assessed and documented?	Unclear	Eligible study designs were pre-specified in the inclusion criteria. Risk of bias was assessed using tools described in the Cochrane Handbook for Systematic Reviews and Interventions (reference given) for RCTs and cluster RCTs, and the EPOC-Cochrane Group tool (URL given) for controlled clinical trials, controlled before-and-after studies and interrupted time series. The rating system was 'high', 'low' or 'unclear' in RCTs, but was not specifically reported for other study designs (although it appears to have been the same). There was no overall summary of the risk of bias in the individual studies; instead risk of bias was reported for studies organized according to study interventions.
8. Was the scientific quality of the included studies used	No	The findings were presented according to study intervention, with the risk of bias reported according to study design but were not discussed further. In their discussion the authors only

Brusamento, S., et al. (2012). Assessing the effectiveness of strategies to implement clinical guidelines for the management of chronic diseases at primary care level in EU Member States: a systematic review. Health Policy 107(2-3): 168-183.		
AMSTAR criteria	**Assessed**	**Explanation**
appropriately in formulating conclusions?		stated the risk of bias in studies according to how effective the interventions were. Aside from noting how few rigorous studies there are and the need for good quality studies, there was no real consideration of study quality within the conclusions.
9. Were the methods used to combine the findings of studies appropriate?	Yes	The authors presented a narrative synthesis of the included studies. They stated that since outcome measures varied across recommendations, they could not pool the results of different studies and provide an overall estimate of effectiveness.
10. Was the likelihood of publication bias assessed?	No	The authors did not report that publication bias was assessed.
11. Was the conflict of interest stated?	No	Conflicts of interest and funding sources were declared for the systematic review but were not acknowledged for the individual included studies.

Carlsen, B., et al. (2007). Thou shalt versus thou shalt not: a meta-synthesis of GPs' attitudes to clinical practice guidelines. British Journal of General Practice 57(545): 971-978.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Unclear	The aims of the review were stated and a bulleted list of inclusion criteria was provided. Additional reasons for study exclusion were noted in the reporting of the study selection and quality assessment stages. There was no mention of a protocol or pre-determined/a priori published research objectives, but it was stated that ethical approval was not required as the study only draws on already published material.
2. Was there duplicate study selection and data extraction?	Unclear	All retrieved titles and abstracts and independently identified studies that fulfilled the selection criteria were assessed. Full-text versions of selected papers were independently assessed for inclusion, with any disagreements resolved by discussion. The selected studies were read and reread to identify key themes and categories, which formed the basis of charts summarising key information about each study. No further details of reviewer involvement were reported.
3. Was a comprehensive literature search performed?	Unclear	Five electronic databases were searched from inception until November 2006; the search strategies were provided in a supplementary table online. Although the authors did not provide details of other approaches to identify additional studies, they assessed both retrieved titles/abstracts and independently identified studies, which suggests other strategies were used.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	No	Only papers that were published in English, Spanish or a Scandinavian language were eligible for inclusion. The authors' statement concerning ethical approval states, in essence that only published material was considered.
5. Was a list of studies (included and excluded) provided?	No	A table of included studies was provided in an online supplementary table, but there were no details of the five studies that were excluded following quality appraisal.
6. Were the characteristics of the included studies provided?	Unclear	The included studies were tabulated with details of the health topic, intervention (type of guideline) and extracted themes. A supplementary table provided further study details in terms of design, setting, participants and guideline theme. However, the ranges of characteristics in all the studies analysed were not reported.
7. Was the scientific quality of the included studies assessed and documented?	No	The authors sought papers reporting qualitative research. Quality was assessed using an adaptation of the Critical Appraisal Skills Programme (CASP) quality-assessment tool for qualitative studies. Although not specifically reported in the selection criteria, studies were excluded if they were low quality or did not demonstrate consistency between presented data and authors' interpretations. The quality of the individual studies was not documented.
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	No	The authors discussed the strengths and limitations of the study, highlighting the fact that low quality studies were excluded, but did not refer to or consider the quality of the included studies when drawing conclusions and making recommendations.
9. Were the methods used to	Yes	The authors presented a narrative synthesis of the included studies to explore patterns in the

Carlsen, B., et al. (2007). Thou shalt versus thou shalt not: a meta-synthesis of GPs' attitudes to clinical practice guidelines. British Journal of General Practice 57(545): 971-978.		
AMSTAR criteria	**Assessed**	**Explanation**
combine the findings of studies appropriate?		distribution of key themes identified across studies. Despite selecting studies from a similar setting and paying attention to the context, participants and clinical topic of each study, the authors stated they were unable to extract findings of interest beyond the individual studies and the synthesis allowed demonstration of patterns that would otherwise have been missed.
10. Was the likelihood of publication bias assessed?	No	The authors did not report that publication bias was assessed.
11. Was the conflict of interest stated?	No	Competing interests and funding sources were declared for the systematic review but not acknowledged for the individual included studies.

Chaillet, N., et al. (2006). Evidence-based strategies for implementing guidelines in obstetrics: a systematic review. Obstetrics & Gynaecology 108(5): 1234-1245.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Unclear	The objectives of the review were stated and inclusion/exclusion criteria were provided. There was no reference to a protocol, ethics approval or pre-determined/a priori published research objectives.
2. Was there duplicate study selection and data extraction?	Unclear	Details of the study selection process were not reported. Two reviewers independently extracted data from selected studies, and any disagreements were resolved by consensus.
3. Was a comprehensive literature search performed?	Yes	Three electronic databases were searched from Jan 1990 to June 2005. The search terms were reported. The authors tried to identify additional studies by checking the reference lists of retrieved articles and by contacting experts in the field.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Unclear	Publication status was not mentioned within the eligibility criteria. The authors did not state that they searched for studies regardless of their publication type.
5. Was a list of studies (included and excluded) provided?	No	A list of included and excluded studies was not provided.
6. Were the characteristics of the included studies provided?	No	Limited details of the included studies were tabulated (study design and setting, intervention, and results). In particular, details of sample sizes, participant characteristics and study duration were lacking.
7. Was the scientific quality of the included studies assessed and documented?	Yes	Eligible study designs were pre-specified in the inclusion criteria. Quality of the included studies was assessed using Cochrane EPOC criteria; the rating system was described. Only studies classified as 'fair' or 'good' quality were included in the review. Although there was no summary table of the quality assessment, the number of studies of each type was reported within the text, along with the main reasons for a 'fair' quality rating (with references provided for those studies not meeting the corresponding criteria).
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	No	The authors did not consider the quality of their studies in the discussion of the results, or when drawing conclusions and making recommendations, although they did comment that the findings should be considered with caution since their results could suggest a publication bias.
9. Were the methods used to combine the findings of studies appropriate?	Unclear	The studies were combined in a narrative synthesis with a discussion of the possible reasons for differences in the effectiveness between the studies. Odds ratios were reported for the individual studies, but the authors did not combine them or provide an explanation for not combining them.
10. Was the likelihood of publication bias assessed?	No	A formal assessment of publication bias was not reported, although the authors stated that their results could suggest a publication bias (potentially negative results being less likely to be published).
11. Was the conflict of interest	No	Only the funding of the review was reported. Funding or support of the individual included studies

Chaillet, N., et al. (2006). Evidence-based strategies for implementing guidelines in obstetrics: a systematic review. Obstetrics & Gynaecology 108(5): 1234-1245.		
AMSTAR criteria	**Assessed**	**Explanation**
stated?		was not reported.

Cochrane, L. J., et al. (2007). Gaps between knowing and doing: understanding and assessing the barriers to optimal health care. Journal of Continuing Education in the Health Professions 27(2): 94-102.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Unclear	The abstract stated that included articles had fulfilled established criteria, and that the analysis was guided by two research questions (both stated). The criteria used were reported in the main text, but lacked clarity: it was difficult to differentiate what had been pre-specified and what represented actual practice. There was no reference to a protocol, ethics approval or pre-determined/a priori published research objectives.
2. Was there duplicate study selection and data extraction?	Unclear	One investigator screened titles and/or full bibliographical citations to identify candidate articles. Two investigators then independently reviewed the full text of selected articles, excluding those that did not meet the inclusion criteria. A third investigator resolved any differences. Two investigators extracted the data; it was not stated how any differences were resolved.
3. Was a comprehensive literature search performed?	Yes	Six electronic databases were searched from 1998 to March 2007, replicating previous search strategies (references given). The search terms were reported. Checking the bibliographies of retrieved articles, contacting colleagues and experts in the field, and reviewing bibliographies in relevant textbooks identified additional studies.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	No	The searches were restricted to English language articles.
5. Was a list of studies (included and excluded) provided?	No	A list of included and excluded studies was not provided.
6. Were the characteristics of the included studies provided?	No	Data from the original articles was not provided in an aggregated form, the authors just tabulated the frequency of articles reporting particular themes (barriers) and the assessment methods used. There was no indication that data on the included studies were available elsewhere (e.g. supplementary tables/appendices).
7. Was the scientific quality of the included studies assessed and documented?	No	Study design was not considered in the inclusion criteria. The overall quality of the included studies does not appear to have been formally assessed, although the authors reported describing and critically examining the methods (e.g. instrument design and testing of barrier questions) for collecting and analyzing data on barriers to guideline adherence. Some general comments were made, but nothing specific to the individual studies.
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	Unclear	No formal assessment of overall study quality was apparent; instead the authors focused on methodology and discussed the limitations of barrier studies. However, the authors stated (in the Discussion point within the abstract) that while many studies are methodologically weak, there are indications that designs are becoming more aligned with the complexity of the health care environment.
9. Were the methods used to combine the findings of studies	Yes	The authors presented a narrative synthesis of the included studies, which would seem appropriate given that the methods emerging from the candidate articles were quantitative,

Cochrane, L. J., et al. (2007). Gaps between knowing and doing: understanding and assessing the barriers to optimal health care. Journal of Continuing Education in the Health Professions 27(2): 94-102.		
AMSTAR criteria	**Assessed**	**Explanation**
appropriate?		qualitative, and mixed methods. The studies abstracted were coded according to 33 emerging themes, and then placed into seven categories that typified the barriers and grouped according to involvement (patient, health care professional, etc.). This coding and grouping reduced the data to displays that showed relationship patterns between barriers, which were then discussed.
10. Was the likelihood of publication bias assessed?	No	The authors did not report an assessment of publication bias.
11. Was the conflict of interest stated?	No	Conflicts of interest and funding sources were not reported for either the systematic review or the individual included studies.

Francke, A. L., et al. (2008). Factors influencing the implementation of clinical guidelines for health care professionals: a systematic meta-review. BMC Med Inform Decis Mak 8: 38.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Unclear	Both a review question and inclusion/exclusion criteria were stated. However, there was no reference to a protocol, ethics approval or pre-determined/a priori published research objectives.
2. Was there duplicate study selection and data extraction?	Yes	Study selection was a two-stage process: screening the titles and abstracts of retrieved references, and then assessment based on full text articles. Two independent reviewers were involved at both stages, and any disagreements were resolved by discussion. One reviewer extracted the data and a second reviewer checked the extraction.
3. Was a comprehensive literature search performed?	Unclear	Five electronic databases were searched for systematic reviews and meta-reviews using a search strategy developed for PubMed and adapted to run in the other databases. The search strategy for PubMed was presented. The searches were conducted in November 2006 and there were no restrictions on the search period. The authors also searched the GIN-website, but no further details were provided.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Unclear	This was a review of systematic reviews and meta-reviews. The authors loosely refer to searching for relevant publications but, with the exception of not applying any language restrictions, they did not explicitly state they sought published reports or searched for reports regardless of their publication type. However, they excluded the CENTRAL database from their search of the Cochrane Library, and searched NIVEL catalogues and the GIN-website.
5. Was a list of studies (included and excluded) provided?	No	A list of included and excluded studies was not provided.
6. Were the characteristics of the included studies provided?	Unclear	Data extracted from the included reviews were summarised in a table that was only available online. The link to this file worked and the document was downloadable. The table summarised the references, aims, brief study details, methodological details, results and conclusions of these reviews, but generally not details of the primary studies they included.
7. Was the scientific quality of the included studies assessed and documented?	Yes	The author sought systematic reviews or meta-reviews. Methodological quality was assessed using the Quality Assessment Checklist for Reviews (Oxman and Guyatt; refs given). The checklist was available online; the link to it worked and the file was downloadable. The overall scores on the checklist range from extensive flaws (score 1 or 2) to minimal flaws (score 7). Although there was no summary table showing the results of the quality assessment, the overall scores for the individual reviews were reported clearly and appropriately in the main text.
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	No	Methodological quality was appropriately incorporated into the reporting and discussion of the results of this review (of reviews). However, it was not taken into consideration when drawing conclusions or making recommendations for future studies, even though methodological issues were discussed. The authors noted the paucity of relevant literature.
9. Were the methods used to	Yes	A narrative synthesis was presented. The authors stated that because of the large variety of

Francke, A. L., et al. (2008). Factors influencing the implementation of clinical guidelines for health care professionals: a systematic meta-review. BMC Med Inform Decis Mak 8: 38.		
AMSTAR criteria	**Assessed**	**Explanation**
combine the findings of studies appropriate?		factors described and methods used, no quantitative pooling was performed across the reviews. In addition, the majority of the reviews studied did not provide numbers, e.g. in the form of effect sizes, that would enable pooling.
10. Was the likelihood of publication bias assessed?	No	The authors did not report an assessment of publication bias.
11. Was the conflict of interest stated?	No	Competing interests and financial support were declared for this review but not for the individual reviews it included.

Grimshaw, J. M., et al. (2004). Effectiveness and efficiency of guideline dissemination and implementation strategies. Health Technology Assessment (Winchester, England) 8(6): iii-iv, 1-72.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Unclear	The objectives of the review were stated and inclusion/exclusion criteria were reported briefly in the main text, with further details provided in the separate online Appendices (accessed and downloaded). The authors did not refer to a protocol, ethics approval or pre-determined/a priori published research objectives, but they did state that the review followed methods proposed by the Cochrane EPOC group.
2. Was there duplicate study selection and data extraction?	Unclear	Two reviewers screened search results to identify potentially relevant studies, assessed hard copies of these studies against the inclusion criteria, and independently extracted the data. Any disagreements in study selection were resolved by consensus in discussion with a third reviewer; disagreement resolution at the data extraction stage was not reported.
3. Was a comprehensive literature search performed?	Yes	Five electronic databases and one specialised register were searched using a gold standard search strategy developed from hand searches of key journals. The search dates were stated and details of the search strategies were provided in the separate online appendices (accessed and downloaded). The references of 51 relevant systematic reviews identified from an Effective Health Care bulletin on 'Getting evidence into practice' were also checked.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Unclear	The searches were not restricted by language of publication. The authors searched a database of grey literature, but did not specifically mention that they sought reports regardless of their publication type.
5. Was a list of studies (included and excluded) provided?	No	The bibliographic details of the included studies were listed in a supplementary appendix (accessed and downloaded). The excluded studies were neither listed nor referenced, but details of them were reportedly available from the authors.
6. Were the characteristics of the included studies provided?	Unclear	Extensive details of the characteristics of each of the included studies, including methodological quality, were tabulated in the online appendices (accessed and downloaded). There was substantial discussion of the participants and interventions in the included studies. However, the ranges of characteristics in all the studies analysed were not reported.
7. Was the scientific quality of the included studies assessed and documented?	Yes	Eligible study designs were pre-specified in the inclusion/exclusion criteria. The methodological quality of the included studies was assessed using the Cochrane EPOC group's methodological quality criteria. Details of the quality criteria and scoring system were shown in a figure, with criteria grouped according to study design. Studies reporting economic evaluations and cost analyses were further assessed against the British Medical Journal guidelines for reviewers of economic evaluations. Quality scores for each item were reported for each included study in the tables in the online appendices, and summary tables showing the quality of the studies by design and allocation were presented in the main report.
8. Was the scientific quality of the included studies used	Unclear	The methodological quality of the studies was discussed overall but was not incorporated into the reporting and discussion of the results for individual interventions. However, it was highlighted in

Grimshaw, J. M., et al. (2004). Effectiveness and efficiency of guideline dissemination and implementation strategies. Health Technology Assessment (Winchester, England) 8(6): iii-iv, 1-72.		
AMSTAR criteria	**Assessed**	**Explanation**
appropriately in formulating conclusions?		the overall discussion of the review, and alluded to when drawing conclusions and making recommendations. The conclusions are therefore tentative and need to be explored in future well-designed, robust evaluations; There is an imperfect evidence base to support decisions about which guideline dissemination and implementation strategies are likely to be efficient under different circumstances.
9. Were the methods used to combine the findings of studies appropriate?	Yes	Single estimates of dichotomous process variables were derived for each study comparison, and a narrative synthesis was also presented. The authors had not planned to undertake formal meta-analysis given the expected extreme heterogeneity within the review and the number of studies with potential unit of analysis errors. A planned meta-regression analysis could not be undertaken owing to the large number of different combinations of multifaceted interventions.
10. Was the likelihood of publication bias assessed?	No	The authors did not report an assessment of publication bias. The authors commented that the majority of studies were conducted in the USA and the applicability of the results to other settings is uncertain.
11. Was the conflict of interest stated?	No	Financial support, but not conflicts of interest, were declared for the systematic review but not for the individual studies it included.

Gurses, A. P., et al. (2010). Using an interdisciplinary approach to identify factors that affect clinicians' compliance with evidence-based guidelines. Critical Care Medicine 38(8 Suppl): S282-291.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Unclear	The objectives of the review were stated. It was unclear whether or not the general lack of explicit inclusion and exclusion criteria reflected the broad nature of the review. In addition, the authors did not refer to a protocol, ethics approval or pre-determined/a priori published research objectives.
2. Was there duplicate study selection and data extraction?	Unclear	Study selection was a two-stage process. One author reviewed titles and abstracts to identify candidate articles, and then two authors independently reviewed the full text versions of selected articles. Any disagreements regarding inclusion were resolved by discussion among three authors. Data extraction was not specifically reported: two authors reviewed the selected papers to identify key factors and categories for synthesis.
3. Was a comprehensive literature search performed?	Yes	Three electronic databases were searched; the search terms were provided but not the search dates. The bibliographies of identified papers were searched for additional relevant literature, and a brainstorming session with 11 researchers from various disciplines was conducted to identify further well-known models.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	No	Only English language and full-length papers were included
5. Was a list of studies (included and excluded) provided?	No	The included models were listed according to whether they had been identified by the literature review or through the brainstorming session. A list of excluded studies was not provided.
6. Were the characteristics of the included studies provided?	No	Data from the original articles was not provided in an aggregated form. The authors reported models according to factors affecting guideline compliance, grouped under the four main categories identified. Each broad category was described in the text. There was no indication that further information on the included papers/models was available elsewhere (e.g. supplementary tables/appendices).
7. Was the scientific quality of the included studies assessed and documented?	No	Papers describing or testing models were included. Neither the quality of the papers reporting the models nor the models themselves were assessed.
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	N/A	The quality of the included papers/models was not assessed.
9. Were the methods used to combine the findings of studies appropriate?	No	The authors stated that major categories of factors (that impact clinicians' compliance) emerged once the data were synthesized. However, there were no specific details of data synthesis: two reviewers extensively reviewed the papers. Models were grouped under four main categories of

Gurses, A. P., et al. (2010). Using an interdisciplinary approach to identify factors that affect clinicians' compliance with evidence-based guidelines. Critical Care Medicine 38(8 Suppl): S282-291.		
AMSTAR criteria	**Assessed**	**Explanation**
		factors that affect guideline compliance, and each broad category described in the text using the most relevant and comprehensive model found in the literature. Additional factors from other conceptual models enhanced the descriptions. Thus, not all models would have been discussed in each applicable category.
10. Was the likelihood of publication bias assessed?	No	The authors did not report an assessment of publication bias.
11. Was the conflict of interest stated?	No	Conflicts of interest and financial support were declared for this review but not for the individual studies it included.

Heselmans, A., et al. (2009). Effectiveness of electronic guideline-based implementation systems in ambulatory care settings - a systematic review. Implementation Science 4: 82.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Unclear	A review question was posed and inclusion/exclusion criteria were stated. However, there was no reference to a protocol, ethics approval or pre-determined/a priori published research objectives.
2. Was there duplicate study selection and data extraction?	Yes	Two reviewers independently selected studies from the titles and abstracts of all retrieved references, and reviewed the full text of those chosen. Data were extracted by one reviewer and checked by another. Any disagreements between reviewers were discussed and resolved by consensus, with a third reviewer consulted if an agreement was not reached.
3. Was a comprehensive literature search performed?	Yes	Five electronic databases were searched; the search dates and search terms were stated. In addition, the search strategy for MEDLINE was available online (file accessed and downloaded). The reference lists of all relevant studies and related systematic reviews were checked and Google scholar was searched to ensure that no studies were missed.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Unclear	There was no specific mention of the review searching for reports regardless of their publication type, although in the abstract it was stated that 27 publications were selected for analysis. In addition, in the discussion of potential biases in the review process the authors state that a manual search was not performed because it was not possible to determine a set of objective criteria for the inclusion of one journal and exclusion of another. These comments suggest that only published articles were eligible for review.
5. Was a list of studies (included and excluded) provided?	No	Excluded studies and the reason for their exclusion were presented in an online table (file accessed and downloaded). A separate list of included studies was not provided.
6. Were the characteristics of the included studies provided?	Unclear	Summary tables provided brief details of the study design, participants, interventions, outcomes and risk of bias in the included studies, with studies grouped according to the comparison of interest. Further study characteristics, e.g. study setting, duration and targeted diseases, were reported in the main text. More extensive data were reported in supplementary online tables (accessed and downloaded). However, the ranges of characteristics in all the studies analysed were not reported.
7. Was the scientific quality of the included studies assessed and documented?	Yes	Eligible study designs were pre-specified in the inclusion/exclusion criteria. The methodological quality of the studies was evaluated using the EPOC data collection checklists (ref given), with studies assigned a low, moderate or high risk of bias. Studies were excluded from the final analysis summary if they had major methodological flaws. The risk of bias for each study was reported in the summary tables and discussed more comprehensively in the main text. It was noted that several criteria could not be rated because of insufficient information.
8. Was the scientific quality of the included studies used appropriately in formulating	No	Methodological quality/risk of bias was reported and discussed separately from the findings of the included studies. It was not taken into consideration when drawing conclusions or making recommendations for future studies. The authors noted the limited number of studies retrieved and

Heselmans, A., et al. (2009). Effectiveness of electronic guideline-based implementation systems in ambulatory care settings - a systematic review. Implementation Science 4: 82.		
AMSTAR criteria	**Assessed**	**Explanation**
conclusions?		their variable methodological quality.
9. Were the methods used to combine the findings of studies appropriate?	Yes	A meta-analysis was not performed due to the risk of bias in some of the included studies and the heterogeneity in outcome measures. A narrative synthesis was presented for each comparison of interest.
10. Was the likelihood of publication bias assessed?	No	The authors briefly discussed two forms of bias that could possibly have influenced the review process: identification of potentially relevant studies and final selection of studies. They did not specifically address publication bias.
11. Was the conflict of interest stated?	No	Competing interests, but not financial support, were declared for the systematic review but not for the individual studies it included.

Lineker, S. C. and J. A. Husted (2010). Educational interventions for implementation of arthritis clinical practice guidelines in primary care: effects on health professional behavior. J Rheumatol 37(8): 1562-1569.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Unclear	The objective of the review and the inclusion criteria were stated. There was no mention of a protocol or pre-determined/a priori published research objectives.
2. Was there duplicate study selection and data extraction?	No	One reviewer selected the studies. Details of the data extraction process were not reported.
3. Was a comprehensive literature search performed?	Yes	Four electronic databases were searched for articles published between 1994 and 2009; some MeSH headings were stated. The reference lists of retrieved articles were also reviewed for relevant articles.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	No	Only papers published in English were eligible for inclusion.
5. Was a list of studies (included and excluded) provided?	No	A list of included and excluded studies was not provided.
6. Were the characteristics of the included studies provided?	Unclear	The included studies were summarised in a table in terms of design, guideline, participants, outcome, clinical importance and modified Philadelphia Panel grade. However, the ranges of characteristics in all the studies analysed were not reported.
7. Was the scientific quality of the included studies assessed and documented?	Unclear	With the exception of being a prospective evaluation study, study design was not pre-specified in the inclusion criteria. The authors stated that quality was assessed using a standardized approach based on methods recommended by Law et al. (references provided), but did not describe the quality items considered. Although some aspects of quality were discussed for individual studies within the text, the results of the quality assessment were not reported consistently or for each individual study. Instead, the authors reported the grade of each study according to a modified version of the Philadelphia Panel methodology (refs provided), which grades studies on strength of design, clinical relevance, and statistical significance.
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	No	Study quality and strength of the evidence were appropriately incorporated into the reporting and discussion of the results of the review. However, they were not taken into consideration when drawing conclusions or making recommendations for future studies. The authors noted the paucity of relevant literature.
9. Were the methods used to combine the findings of studies appropriate?	N/A	Although the abstract states the article provides a review and synthesis of studies, there was no narrative or statistical synthesis of the studies. Each of the included studies was described separately organized by type of intervention.
10. Was the likelihood of publication bias assessed?	No	The authors did not report an assessment of publication bias. The authors did not comment that assessment was not feasible given the few studies identified.
11. Was the conflict of interest	No	Conflicts of interest and funding sources were not reported for either the systematic review or the

Lineker, S. C. and J. A. Husted (2010). Educational interventions for implementation of arthritis clinical practice guidelines in primary care: effects on health professional behavior. J Rheumatol 37(8): 1562-1569.		
AMSTAR criteria	**Assessed**	**Explanation**
stated?		individual included studies.

Medves, J., et al. (2010). Systematic review of practice guideline dissemination and implementation strategies for healthcare teams and team-based practice. Int J Evid Based Healthc 8(2): 79-89.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Yes	The aim of the review was stated and inclusion/exclusion criteria were reported. A review protocol was developed and registered with the Joanna Briggs Institute (JBI) and feedback was incorporated before the start of the review.
2. Was there duplicate study selection and data extraction?	Unclear	Two reviewers screened all articles and where there was disagreement a third reviewer determined inclusion. Data extraction was not specifically mentioned. The authors stated that at each stage two reviewers read each paper, and that two reviewers read each paper included in the final review and checked tables for accuracy.
3. Was a comprehensive literature search performed?	Unclear	The summary of the search strategy depicted a MASTARI flow diagram of the study selection process but not specific details of sources searched and keywords. More than 10 databases were searched; the search dates were provided. The authors referred the reader to the Joanna Briggs website for further details of the literature search but did not provide a specific link to the relevant pages; attempts to find the review on the JBI website were unsuccessful (Dec. 2013).
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Unclear	There were few details of the search strategy in this article. Publication status was not mentioned within the eligibility criteria and the authors did not state that they searched for studies regardless of their publication type.
5. Was a list of studies (included and excluded) provided?	No	A list of included and excluded studies was not provided.
6. Were the characteristics of the included studies provided?	No	Data from the original articles was not provided in an aggregated form. A table reported the number of retrieved studies according to dissemination and implementation strategy, and the frequency of significant studies. Some studies were discussed in the text; the authors noted (as a limitation of their study) that not all included articles were described due to limited space in the article and gave their reference numbers.
7. Was the scientific quality of the included studies assessed and documented?	Unclear	RCTs and other research designs were eligible for inclusion. The methodological rigour of the studies was assessed prior to inclusion in the review using the standardised critical appraisal instruments from the JBI MASTARI. The quality criteria and their scoring were not described, and there was no indication of whether any studies were excluded on the basis of quality. The quality of the included studies was neither summarised nor discussed.
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	No	The authors did not report or consider the quality of the included studies either when reporting their results or when drawing conclusions and making recommendations.

Medves, J., et al. (2010). Systematic review of practice guideline dissemination and implementation strategies for healthcare teams and team-based practice. Int J Evid Based Healthc 8(2): 79-89.		
AMSTAR criteria	**Assessed**	**Explanation**
9. Were the methods used to combine the findings of studies appropriate?	Yes	A narrative synthesis was presented. The authors commented in the introduction that a narrative analysis was all that could be conducted; as it was likely that the mixed methods of many of the original studies would preclude a quantitative analysis and that the types of interventions and dissemination strategies were unlikely to be comparable across studies. They acknowledged the heterogeneous sample when discussing the limitations of the review.
10. Was the likelihood of publication bias assessed?	No	The authors did not report an assessment of publication bias.
11. Was the conflict of interest stated?	No	Financial support, but not competing interests, were declared for the systematic review but not for the individual studies included.

Mickan, S., et al. (2011). Patterns of 'leakage' in the utilisation of clinical guidelines: a systematic review. Postgraduate Medical Journal 87(1032): 670-679.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Yes	A research question was stated and inclusion/exclusion criteria were reported. A protocol was agreed in advance and can be obtained from the authors on request. The authors commented that there were no amendments to the protocol.
2. Was there duplicate study selection and data extraction?	Unclear	Two authors independently reviewed identified citations for inclusion and extracted data. Any disagreements during these processes were resolved by consensus.
3. Was a comprehensive literature search performed?	Unclear	Four electronic databases were searched. The search dates were provided and some search terms; the full strategy was said to be available on request. A forward citation review of the original article underlying this research was carried out using three additional electronic databases.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Unclear	Publication status was not mentioned within the eligibility criteria and the authors did not state that they searched for studies regardless of their publication type.
5. Was a list of studies (included and excluded) provided?	No	A list of included and excluded studies was not provided.
6. Were the characteristics of the included studies provided?	No	Details of the included studies in terms of time of study, intervention (guideline), condition, participants, outcome measure, measurement validation and results were tabulated. Some further details of the guidelines were reported in the text. However, the ranges of characteristics in all the studies analysed were not reported.
7. Was the scientific quality of the included studies assessed and documented?	Unclear	Inclusion criteria specified eligible study designs. The quality of the included studies was assessed using a proforma comprising eight criteria, although the scoring system was not described. The quality of the studies was discussed generally and not for each separate study. There was also no summary of the individual ratings of each study.
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	No	The authors commented in their discussion that the systematic review was limited by the validity of the included primary studies. Aside from this, study quality was not taken into consideration when reporting the results or when drawing conclusions and making recommendations.
9. Were the methods used to combine the findings of studies appropriate?	Yes	A narrative synthesis was presented. The authors stated in the Methods that although their protocol suggested they would perform a meta-analysis, the heterogeneity of the studies precluded this.
10. Was the likelihood of publication bias assessed?	No	The authors did not report an assessment of publication bias.
11. Was the conflict of interest stated?	No	Financial support and competing interests were declared for the systematic review but not for the individual studies it included.

Okelo, S. O., et al. (2013). Interventions to modify health care provider adherence to asthma guidelines: a systematic review. Pediatrics 132(3): 517-534.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Yes	The research questions were stated and the inclusion/exclusion criteria were reported. A draft protocol was finalized with input from the technical expert panel and representatives from the AHRQ; the final protocol was posted on the Effective Health Care Program website. The methods for this review were reported to follow the AHRQ Methods Guide for Effectiveness and Comparative Effectiveness Reviews.
2. Was there duplicate study selection and data extraction?	Yes	Paired investigators independently screened each title and abstract to exclude non-eligible studies, then assessed the full-text of candidate articles to select studies for inclusion. At both stages, any disagreements regarding article inclusion were resolved by consensus. One reviewer extracted the data and a second reviewer confirmed the first reviewer's data abstraction for completeness and accuracy. Differences between reviewer pairs were resolved through discussion, or through consensus among the team if needed.
3. Was a comprehensive literature search performed?	Yes	Seven electronic databases were searched in July 2012; no limits on publication date were applied The search strategies were reported in detail. Backward citation searched was conducted for each included study.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	No	Within the discussion of the limitations of the review, the authors acknowledged that they did not consider or search for reports of potentially relevant studies in the grey literature. In addition, although they identified potentially eligible studies that were published in a language other than English (searches not restricted by language) they were unable to determine eligibility due to resource limitations.
5. Was a list of studies (included and excluded) provided?	No	A list of excluded studies, but not included studies, was provided.
6. Were the characteristics of the included studies provided?	Yes	Information on the included studies was provided in evidence tables relating to general study characteristics, healthcare providers, interventions, clinical outcomes and healthcare process outcomes. Further details of the populations within each study were also tabulated. The studies were also described in the text, with summary tables presenting numbers of studies according to intervention, design, setting, etc.
7. Was the scientific quality of the included studies assessed and documented?	Yes	Eligible study designs were pre-specified in the inclusion criteria. The risk of bias of controlled studies was assessed using the Cochrane Collaboration's tool (ref given), with each criterion judged as Low risk of bias, High risk of bias, or Unclear risk of bias (information is insufficient to assess). Two relevant criteria from the Cochrane EPOC data collections checklists (ref given) were added for the assessment of pre-post studies. The strength of the evidence for each outcome was also graded using the grading scheme recommended by the Methods Guide for Effectiveness and Comparative Effectiveness Reviews (further details and reference provided). The risk of bias

Okelo, S. O., et al. (2013). Interventions to modify health care provider adherence to asthma guidelines: a systematic review. Pediatrics 132(3): 517-534.		
AMSTAR criteria	**Assessed**	**Explanation**
		judgments for each item were tabulated for each included study. The authors also provided tables summarizing the strength of the evidence according to intervention for each review question.
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	Unclear	The quality of the studies was not discussed within the narrative synthesis, or when drawing conclusions and making recommendations. However, in tables reporting conclusions according to research question and type of intervention class, the strength of evidence was reported and taken into consideration. The authors noted a relative paucity of studies utilizing rigorous study designs (particularly randomised controlled trials).
9. Were the methods used to combine the findings of studies appropriate?	Yes	The authors stated that the heterogeneity of the studies in terms of outcome measures, study populations and interventions, precluded quantitative synthesis. A qualitative synthesis of the evidence was presented.
10. Was the likelihood of publication bias assessed?	Yes	A formal assessment of publication bias was not conducted. The authors deemed it challenging, at best, and questioned the usefulness of funnel plots for studies with fewer than 10 studies for a specific outcome. The potential for publication bias was acknowledged: studies reported in the grey literature were not considered or searched for, and some non-English reports of studies were excluded, as eligibility could not be determined. However, the authors did not feel that the exclusion of non-English reports would influence their conclusions or ability to draw conclusions; these studies represented a minority of the overall number of excluded articles and abstracts; and the relevance of these studies to the U.S. health care setting or U.S. health care provider was unclear.
11. Was the conflict of interest stated?	No	Conflicts of interest and funding were reported for the systematic review but not for the individual included studies.

Prior, M., et al. (2008). The effectiveness of clinical guideline implementation strategies--a synthesis of systematic review findings. J Eval Clin Pract 14(5): 888-897.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Unclear	The aim of the review was stated and inclusion/exclusion criteria were reported. However, there was no reference to a protocol, ethics approval or pre-determined/a priori published research objectives.
2. Was there duplicate study selection and data extraction?	No	The primary author reviewed titles and abstracts against the inclusion/exclusion criteria and extracted all relevant data from the included reviews.
3. Was a comprehensive literature search performed?	Yes	Five electronic databases were searched for relevant literature; the search strategy was shown. Although not specifically reported as search dates, a range of publication years was specified within the inclusion criteria. The reference lists of the included systematic reviews were hand searched.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	No	Only systematic reviews published in the English language were included. Within the discussion of the limitations of their review, the authors stated that grey literature was not sought.
5. Was a list of studies (included and excluded) provided?	No	A list of included and excluded studies was not provided.
6. Were the characteristics of the included studies provided?	No	There was an extremely brief overview of the primary studies reported in the included reviews, but no details of the reviews themselves (e.g. aims, study details, methodology) apart from the critical appraisal. The findings of the reviews were summarized according to implementation strategy evaluated.
7. Was the scientific quality of the included studies assessed and documented?	Yes	The author sought systematic reviews. The methodological quality of the included reviews was appraised using the AMSTAR tool (ref supplied). This comprises 11 items, which are each scored as 'Yes', 'No', 'Can't answer' or 'Not applicable'. The criteria were listed and the individual scores attained by each review were tabulated in full.
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	Yes	Methodological quality of the included reviews was reported and briefly discussed, separately from the review findings. In addition, the authors highlighted some potential drawbacks in the use of AMSTAR and made suggestions for further research to strengthen its generalizability. The quality of the primary studies informing the included reviews was also mentioned. The quality of both primary and secondary evidence was taken into consideration when drawing conclusions and making recommendations for future studies, albeit in fairly general terms (...however, it is of variable methodological quality, and hence of questionable value in identifying effective strategies. Further good-quality primary and secondary research is required into the costs and cost–benefit analysis of guideline implementation strategies ...).
9. Were the methods used to combine the findings of studies appropriate?	Yes	A narrative synthesis was presented. The authors anticipated that heterogeneity of implementation strategies would preclude calculation of summary effect sizes, or meta-analysis.

Prior, M., et al. (2008). The effectiveness of clinical guideline implementation strategies--a synthesis of systematic review findings. J Eval Clin Pract 14(5): 888-897.		
AMSTAR criteria	**Assessed**	**Explanation**
10. Was the likelihood of publication bias assessed?	No	The decision not to assess publication bias was based on the likely heterogeneity of the included reviews, and concerns regarding the validity of reported publication bias assessments.
11. Was the conflict of interest stated?	No	Competing interests and financial support were not declared for this review, nor for the individual systematic reviews it included.

Simpson, S. H., et al. (2005). Do guidelines guide pneumonia practice? A systematic review of interventions and barriers to best practice in the management of community-acquired pneumonia. Respiratory Care Clinics of North America 11(1): 1-13.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Unclear	The objectives of the review were stated and inclusion/exclusion criteria were provided. There was no reference to a protocol, ethics approval or pre-determined/a priori published research objectives.
2. Was there duplicate study selection and data extraction?	Unclear	Details of the study selection and data extraction processes were not reported.
3. Was a comprehensive literature search performed?	No	One electronic database was searched from 1966 to July 2004; search terms were reported The authors sought additional studies by screening the reference lists of retrieved articles and contacting experts in the field.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Unclear	The searches were limited to records of papers published in English. Although there was no specific mention of the review searching for reports regardless of their publication type. Experts were contacted as part of the search process, but the publications they contributed were not described.
5. Was a list of studies (included and excluded) provided?	No	No list was provided.
6. Were the characteristics of the included studies provided?	Unclear	A table summarising the setting, intervention, study design, time frame, subject groups and clinical outcomes was presented for articles that evaluated the effectiveness of guideline-based interventions, but not for those describing barriers to the adoption and use of guidelines. In addition, the ranges of characteristics in all of the studies analysed were not reported.
7. Was the scientific quality of the included studies assessed and documented?	No	Eligible study designs were pre-specified in the inclusion criteria and exclusion criteria. The quality of the included studies was not assessed.
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	No	The quality of the included studies was not assessed. The authors did not consider the quality of their studies in their discussion of the results, or when drawing conclusions and making recommendations, although they did comment on scientific rigour and suggested that future studies need to use rigorous study designs.
9. Were the methods used to combine the findings of studies appropriate?	Unclear	The authors summarised the outcome data for each effectiveness study in the table, and further described the results of each study in the text. For studies that described factors that limit guideline adherence, reported barriers were grouped and discussed according to three main themes. The authors did not mention the diversity of their studies or discuss potential causes of heterogeneity.
10. Was the likelihood of publication bias assessed?	No	The authors did not report an assessment of publication bias. The authors made no comment that an assessment was not feasible given the few studies identified.
11. Was the conflict of interest stated?	No	Only the funding of the review was reported. Funding or support of the individual included studies was not reported.

van der Wees, P. J., et al. (2008). Multifaceted strategies may increase implementation of physiotherapy clinical guidelines: a systematic review. Australian Journal of Physiotherapy 54(4): 233-241.		
AMSTAR criteria	**Assessed**	**Explanation**
1. Was an 'a priori' design provided?	Unclear	A review question was posed and inclusion/exclusion criteria were stated. However, there was no reference to a protocol, ethics approval or pre-determined/a priori published research objectives.
2. Was there duplicate study selection and data extraction?	No	Details of the study selection process were not reported. Two reviewers independently extracted data from the original studies; it was not stated how any disagreements were resolved.
3. Was a comprehensive literature search performed?	Yes	Four electronic databases were searched; search dates and terms were reported. In addition, reference lists were screened to identify further studies.
4. Was the status of publication (i.e. grey literature) used as an inclusion criterion?	Yes	The authors stated that they performed a broad search to identify any type of publication, based on the assumption that few studies were published about guideline implementation in physiotherapy.
5. Was a list of studies (included and excluded) provided?	No	The authors referenced full papers selected for further scrutiny but did not list the studies included in the review. The excluded studies were referenced alongside the reason for their exclusion.
6. Were the characteristics of the included studies provided?	Unclear	Tables summarising the study design, participants, interventions, outcome measures and results, and quality of the included studies, were presented. However, the ranges of characteristics in all the studies analysed were not reported.
7. Was the scientific quality of the included studies assessed and documented?	Yes	The inclusion criteria specified several different study designs. The quality of the studies was assessed using a checklist adapted from the EPOC Group data collection checklist (ref given); details of the criteria used were tabulated. The results of the quality assessment were reported in a table showing the scores (for each criterion and overall) for each study.
8. Was the scientific quality of the included studies used appropriately in formulating conclusions?	No	The authors did not consider the quality of their studies in either the analysis or discussion of the results, or when drawing conclusions and making recommendations. The authors noted the paucity of relevant literature.
9. Were the methods used to combine the findings of studies appropriate?	Yes	Although the authors had intended to use a random effects model to pool the outcomes of the studies, they stated that the results could not be pooled because of heterogeneity in the interventions and outcome measures. Instead, the studies were described according to outcome measure.
10. Was the likelihood of publication bias assessed?	No	The authors did not report an assessment of publication bias. The authors made no comment that the few studies identified preclude such an assessment.
11. Was the conflict of interest stated?	No	Conflicts of interest and funding sources were not reported for either the systematic review or the individual included studies.