NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

PUBLIC HEALTH DRAFT GUIDELINE

Dementia, disability and frailty in later life – mid-life approaches to prevention

What is this guideline about?

This guideline makes recommendations on approaches in mid-life to prevent or delay dementia, disability and frailty. The aim is to increase the number of older people who can lead independent, healthy and active lives (successful ageing) by:

- reducing the prevalence of behaviours that increase the risk of dementia, disability and frailty
- reducing the incidence of dementia, disability and frailty and delaying their development in people who experience them
- reducing the incidence of a range of other chronic non-communicable conditions in later life that can contribute to disability and frailty (such as cardiovascular diseases, diabetes, chronic obstructive pulmonary disease, and some cancers).

This can be done by promoting a change in various behaviours. This includes: encouraging people to stop smoking; helping them to become more physically active; helping them to reduce their alcohol consumption; and helping them to improve their diet and, where necessary, lose weight and maintain a healthy weight.

The guideline is for policy makers, commissioners, managers and practitioners with public health as part of their remit, working in the public,

private and third sectors. (For further details, see Who should take action?) In addition it may be of interest to members of the public.

See About this guideline for details of how the guideline was developed and its current status.

Contents

1 Draft recommendations

Policy and population-level initiatives

Recommendation 1

National and local government departments with a responsibility for public health should:

- Work together to develop and support population-level initiatives to prevent disability, dementia and frailty. Develop and enforce policies and legal and regulatory frameworks to make it easier for people to:
  - stop smoking
  - be more physically active and less sedentary
  - reduce their alcohol consumption
  - adopt a healthy diet
  - achieve or maintain a healthy weight.
- Make smoking tobacco and drinking alcohol less accessible, affordable and acceptable.
- Make physical activity, adopting a healthy diet and achieving and maintaining a healthy weight as accessible, affordable and acceptable as possible.

Recommendation 2

National government, Public Health England, NHS England, the chief medical officers and national third sector organisations with a public health remit should:

- Include risk reduction for dementia, disability and frailty in national policy documents aimed at preventing other non-communicable chronic diseases (for example cardiovascular disease, stroke and chronic obstructive pulmonary disease). Make it clear that some common behaviours can increase the risk of dementia, disability and frailty. Also make it clear that addressing these risk factors will reduce the likelihood of developing these conditions.

- Ensure those with a responsibility for public health in local authorities and the NHS understand the regulatory options and local legal powers available to them when developing and implementing population-level initiatives. For example, tell them about websites that provide this information, such as Healthy Places.

Recommendation 3

National and local government, Public Health England, NHS England and trading standards officers should continue to develop and enforce comprehensive tobacco control strategies. These should include:

- Using taxation to increase tobacco prices, supported by activities to prevent illegal tobacco sales.
- Removing the remaining opportunities for tobacco promotion, such as packaging, and film and other media portrayals of smoking.
- Extending smoke-free policies into a wider range of public places, for example, public parks, open-air markets and sports grounds.
- Promoting smoke-free homes and cars.
- Making NHS and social care services smoke free (see NICE public health guidelines 10 Smoking cessation services and 48 Smoking cessation in secondary care: acute, maternity and mental health services).
- Promoting strategies to encourage smokers who can't or won't quit to switch from tobacco to less harmful sources of nicotine (see NICE public health guideline 45 Tobacco: harm-reduction approaches to smoking).

Recommendation 4

National and local government and other organisations involved with physical activity or road safety (see Who should take action?), should:

- Develop the environments where people live and work to encourage those who take little exercise to build physical activity into their daily lives on a permanent basis, wherever possible. This should include:
  - Using traffic management and highway schemes to make walking and cycling a more attractive option (see NICE public health guidelines 8 Physical activity and the environment and 41 Walking and cycling).

- Changing the built environment to promote physical activity (see 'Physical activity and the environment').
- Using legislation to protect public open spaces.

Recommendation 5

National and local government, Public Health England, trading standards officers and licensing authorities should ensure policies to reduce alcohol consumption are implemented across the population. This should include:

- Restricting the availability and marketing of alcohol (see recommendation 3 in NICE public health guideline 24 Alcohol-use disorders: preventing harmful drinking').
- Taking local health needs and existing licenses into account when considering whether to grant a new alcohol license (see recommendation 2 in 'Alcohol-use disorders: preventing harmful drinking').
- Enforcing minimum unit pricing, supported by activities to prevent illegal alcohol sales (see recommendation 1 in 'Alcohol-use disorders: preventing harmful drinking').

Recommendation 6

National and local government and Public Health England should:

- Introduce a national framework for action to help people adopt and maintain a healthy diet (see NICE public health guideline 35 Preventing type 2 diabetes: population and community-level interventions). This should include:
  - Financial and regulatory measures to reduce the level of salt, saturated fats, artificial trans fats and added sugars in processed foods (see recommendations 1 to 3 in NICE public health guideline 25 'Prevention of cardiovascular disease'). Marketing of foods that are high in these components should also be limited.
  - Measures to reduce the availability of foods that can contribute to an unhealthy diet. For example, measures to reduce or limit the number of fast food outlets – particularly near schools and workplaces – and controls on the sale of 'street foods' that can contribute to unhealthy

diets. (See 'Preventing type 2 diabetes: population and community-level interventions' and recommendation 23 in 'Prevention of cardiovascular disease'.)

- Activities to make people aware of what constitutes a healthier food choice, where they can buy affordable fresh fruit and vegetables and how to prepare them.

Recommendation 7

National and local government, NHS England and Public Health England should ensure public sector organisations (see Who should take action?) set an example and encourage and support healthy living. For example they should:

- Provide support to help people stop smoking (see NICE public health guidelines 5 Workplace interventions to promote smoking cessation, 45 Tobacco: harm-reduction approaches to smoking and 48 Smoking cessation in secondary care: acute, maternity and mental health services).
- Use notices and posters in and around workplaces and public buildings to encourage more physical activity, because even small increases can be beneficial. For example, notices could be used to show people where the stairs are and to encourage them to use them, or to walk up escalators (see recommendation 6 in NICE public health guideline 8 Physical activity and the environment').
- Follow NHS Eatwell dietary guidelines when providing food (see recommendation 10 in NICE public health guideline 25 'Prevention of cardiovascular disease').

Awareness raising

Recommendation 8

National government, Public Health England and NHS England should:

- Commission national campaigns using a range of media and resources to show how the risk of dementia, disability and frailty can be reduced and to promote the concept of keeping mentally and physically healthy. For

example, use TV and radio campaigns, social media and telephone helplines.

- Aim campaigns at the general population, health and social care professionals and health commissioners and service providers. Include messages such as:
  - Ill health in old age is not inevitable. The risk of developing dementia, disability and frailty can be reduced and, for some, it can be prevented altogether or delayed – and the severity of the conditions reduced.
  - Smoking, lack of physical activity, alcohol consumption, poor diet, and being overweight or obese are risk factors for dementia, disability and frailty.
  - The earlier in life that healthy changes are made, the greater the likelihood of reducing the risk of dementia, disability and frailty. But it's not too late to start making changes if you are already in mid-life.
  - Adopting healthy behaviours as a part of normal, everyday life will increases the chance of maintaining them throughout life.
- Plan the content, style and format of campaigns carefully. Use different media formats to reach as many high-risk communities as possible, for example people with learning disabilities, people with low socioeconomic status and people from black and minority ethnic groups.
- Ensure messages do not stigmatise people by suggesting that people who develop dementia, disability or frailty are at fault. Although some risks can be reduced, not all can be eliminated.

Recommendation 9

National government, Public Health England and NHS England should provide detailed information to promote specific behaviours that can improve someone's health and discourage those that damage health. For example, they should provide information that:

- Encourages smokers to quit or use harm reduction measures by highlighting the immediate and long-term benefits in particular, by making it clear that there is a link between smoking and dementia, disability and frailty.

- Shows how a wide range of domestic, leisure and work activities can help people to be physically active and explains how even modest increases in physical activity can be beneficial. Include information on how physical activity:
  - reduces the risk of illness in both the short and long term, preserves memory and cognitive ability and leads to a healthy old age, improving wellbeing and quality of life
  - is enjoyable and can have social benefits
  - should always be a part of everyday life – it's never too late to start.
- Informs people that alcohol consumption, even within current guidelines, can increase the risk of dementia, disability and frailty and encourages them to reduce the amount they drink as much as possible.
- Informs people that regularly consuming foods high in salt, energy-dense processed snacks and sweetened drinks is bad for health. A diet high in fresh foods, particularly fruit and vegetables, is likely to improve their health (see NICE public health guideline 25 Prevention of cardiovascular disease).
- Advises people to aim to maintain a healthy body weight (see NICE clinical guideline 43 Obesity).
- Also covers other factors, such as how:
  - Poor-quality sleep is associated with reduced quality of life and cognitive decline and may also increase the risk of diabetes and cardiovascular disease. People experiencing poor-quality sleep (that is, people who are not refreshed by a night's sleep) or daytime sleepiness may need to consult their GP. (See NICE technology appraisal guidance 139 Continuous positive airway pressure for the treatment of obstructive sleep apnoea/hypopnoea syndrome and NICE interventional procedure guidance 476 Radiofrequency ablation of the soft palate for snoring.)
  - Psychosocial factors, such as loneliness and isolation, are associated with the development of cognitive decline and dementia.
  - Visual and hearing loss are associated with social isolation and can be a barrier to changing behaviour and using services.

Service organisation and delivery

Recommendation 10

Public Health England, directors of public health, local authorities and providers of NHS Health Checks and behaviour change programmes should:

- Ensure that programmes to prevent non-communicable chronic diseases share resources and expertise nationally and locally to maximise coverage and impact (see recommendations 1–3 in NICE public health guideline 35 'Preventing type 2 diabetes: population and community-level interventions'). Work together to deliver programmes that address multiple risk factors as well as services addressing individual risk factors.
- Develop the NHS Health Checks programme to promote opportunities in mid-life to reduce the risk of dementia, disability and frailty. Tailor the advice component of the NHS Health Check programme for different age groups. Add dementia prevention advice to all health checks.
- Ensure people delivering prevention programmes:
  - Help participants to change a range of behaviours such as smoking, not meeting the chief medical officers' physical activity recommendations, spending long periods being sedentary, drinking more alcohol than is recommended by the chief medical officers and having a poor diet. Also to help participants achieve and maintain a healthy weight.
  - Emphasise the need for, and help people to maintain, healthy behaviours as they age.
  - Help people to identify and find ways to overcome social and psychosocial factors that may prevent them from making positive changes to improve their health. Or direct them to sources of help.
  - Make information and services available to all, targeted towards those with the greatest need whenever possible (see the Equality Act 2010).

Recommendation 11

Local authority commissioners, clinical commissioning groups and third sector organisations with a responsibility for public health should:

- Work together and with local communities to provide services to prevent dementia, disability and frailty. Aim to understand and meet the particular health needs of local populations, particularly high-risk groups. They should provide:
  - Services at convenient times and in easily accessible places. For example, they should offer some outside office hours and in workplaces and community settings (for example, community and faith centres).
  - Services via new media if appropriate (see recommendation 12).
  - Literature in a range of languages and culturally acceptable styles, and offer translation and interpretation facilities if appropriate.

Recommendation 12

Local authority commissioners, clinical commissioning groups and providers of behaviour change interventions and programmes should:

- Provide multicomponent online interventions (web and app-based) to help people change behaviours that put their health at risk.
- Ensure online services on physical activity help people:
  - to assess how physically active they are and compare this with recommended levels
  - create personal activity goals and plans to achieve them
  - by explaining that even small increases in physical activity will be beneficial and can act as a basis for future increases for people whose activity levels are low
  - by, when possible, including one-to-one support either online or by telephone
  - by tailoring interventions for specific groups (for example, to address specific cultural needs linked to physical activity).
- Ensure online services on alcohol misuse include personalised content and communication with a therapist or trained adviser in multiple sessions if possible, because these are more likely to be effective than 'one-off' generic interventions. They should also provide advice on:
  - reducing consumption
  - drinking assessment tools

- educational materials.

Recommendation 13

Local authorities and health and social care providers should:

- Use routine appointments and contacts to identify people at risk of dementia, disability and frailty (for example, appointments with a GP or practice nurse or when attending leisure centre classes). Give them advice on how to reduce the risks.
- Refer people to specialist services when necessary.
- Take advantage of times in life when substantial change occurs. (Examples include: retirement, when children leave home, when starting to care for older relatives or grandchildren, or during the menopause.) These are times when people may consider adopting new healthy behaviours.

Recommendation 14

Local authorities and third sector organisations with a responsibility for, or who support, public health services should:

- Provide supervised activities and classes and safe cycle paths, parks and open green spaces to help people in mid-life to be physically active in different ways – and at different levels of intensity. For example, they should encourage both recreational activities and 'active' travel (such as walking and cycling to work).
- Publicise these opportunities, including where they can be found and who to contact for more information. (See NICE public health guidelines 44 Physical activity: brief advice for adults in primary care, 38 Preventing type 2 diabetes: risk identification and interventions for individuals at high risk and 49 Behaviour change: individual approaches.)

Recommendation 15

Local authority commissioners and clinical commissioning groups, third sector organisations with a responsibility for, or who support, public health and organisations that coordinate or offer training should:

- Commission or provide initial training and continuing professional development programmes for local authority staff, all health and social care professionals and community volunteers on how to prevent dementia, disability and frailty in later life. Include:
  - how to identify people at most risk
  - behavioural risk factors.
- Train participants to provide very brief advice and on when and how to refer people to other services.
- Help participants change their own behaviour to reduce their own health risks if relevant. (See recommendation 10 in NICE public health guideline 45 'Tobacco: harm-reduction approaches to smoking' and recommendation 13 in NICE public health guideline 48 Smoking cessation in secondary care: acute, maternity and mental health services'; also see NICE public health guideline 44 Physical activity: brief advice for adults in primary care).
- Use sector-led improvement to help develop staff and services.

Recommendation 16

Employers, occupational health services, trade unions and third and private sector organisations who support workplace health should:

- Provide information and support in the workplace to help employees:
  - Stop smoking (see NICE public health guidelines 5 Workplace interventions to promote smoking cessation, 45 Tobacco: harm-reduction approaches to smoking and 48 Smoking cessation in secondary care: acute, maternity and mental health services).
  - Be more physically active (see NICE public health guideline 13 Promoting physical activity in the workplace).
  - Improve their mental wellbeing (see NICE public health guideline 22 Promoting mental wellbeing at work).

- Return to work after long-term sick leave (see NICE public health guideline 19 Managing long-term sickness and incapacity for work).

2 Who should take action?

Introduction

The guideline is for policy makers, commissioners and service providers whose remit is public health, and also those whose work influences public health. They could be working in government departments, Public Health England, local government, the NHS and other organisations in the public, private, voluntary and community sectors. It is also aimed at:

- architects, builders and developers
- providers of social housing
- employers
- occupational health services
- trade unions.

In addition, it will be of interest to people in or approaching mid-life and their families, and other members of the public.

Who should do what at a glance

Who should take action	Recommendation
Architects, builders, developers and local authority planning and housing departments	4
Chief medical officers	2
Commissioners of services	11,12,15
Employers, occupational health services, trade unions, third and private sector organisations who support workplace health	16
Health and social care services, local authorities and strategic partnerships (including health and wellbeing boards)	10,12,13,15
Highway authorities and road safety partnerships	4
Licensing authorities	5
Local government officers	1,3,4,5,6,7,10,11,12,13,14,15
National government departments	1,2,3,4,5,6,7,8,9,14
NHS England	2,3,7,8,9
NHS Health check providers	10
Organisations that coordinate or offer training, or that register and set standards for professionals	15
Providers of social housing	4
Public Health England	2,3,5,6,7,8,9,10,
Third sector organisations with a responsibility for or who support public health	2,4,10,11,12,14,15,16
Trading standards officers	3,5

3 Context

Dementia, disability and frailty in later life affect individuals, families and society as a whole, causing reduced quality of life, ill-health and premature mortality. They have a direct effect on community resources, because people are less able to do their usual daily activities and often need support and long-term care. This effect is set to increase in the future as the population ages.

This guideline is about mid-life approaches to preventing or delaying dementia, disability and frailty. The beginnings of ill health can occur in mid-life. Reported changes include the start of a decline in various cognitive functions (such as memory, reasoning and verbal fluency) by age 45 (Newman et al. 2011; Singh-Manoux et al. 2011). An age-related decline in walking speed has been observed after the age of 30 (Newman et al. 2011).

Some limitations in mobility have been identified in 18% of men and 19% of women aged 50–64 in England. In this age group, 11% of men and 10% of women reported difficulties with 1 or 2 activities of daily living (Gardener et al. 2006).

Sensory disability, including hearing loss and visual impairment, is estimated to be responsible for 7–10% of all years lived with disability among those aged 70 or over in the UK (CMO annual report: Surveillance volume 2012, On the state of the public's health, March 2014). Some form of hearing loss is reported by 42% of people over 50 in the UK (Hearing matters Action on Hearing Loss 2011). An estimated 80,000 people of working age have a visual impairment (Evidence base to support the UK Vision Strategy Bosanquet and Mehta 2008). Both hearing loss and visual impairment have been associated with other health and social problems (Hearing matters, Action on Hearing Loss 2011; Evidence base to support the UK Vision Strategy UK Vision Strategy 2008; Rogers and Langa 2010). The odds of people with hearing loss or visual impairment developing dementia or Alzheimer's disease are more than double those of people with good hearing and vision (CMO annual report: Surveillance volume 2012, On the state of the public's health, March 2014).

Age-related physiological changes can be made worse by personal, social and environmental circumstances. For example, people in this age group often have to care for an older person such as a parent, leading to a reduced income and less time for leisure activities. Or they may be unemployed or have retired early, possibly leading to a lower-quality diet because of their drop in income or a reduction in physical activity because they are no longer working.

Several cohort studies have found links between successful ageing and a person never having smoked (or having quit), exercising regularly, eating fruit and vegetables daily and drinking only a moderate amount of alcohol. The EPIC-Norfolk study found that people who adopted all these behaviours lived an average of 14 years longer than people who did none of them (Khaw et al. 2008). They also had more quality-adjusted life years (Myint et al. 2011). In

the Whitehall study, people who adopted all 4 behaviours were 3.3 times more likely to age successfully. The association with successful ageing was linear, with people who adopt healthier behaviours having a greater likelihood of successful ageing (Sabia et al. 2012).

Having more than 1 of the 7 'health risk' factors identified by the Chief Medical Officer (smoking, binge drinking, low fruit and vegetable consumption, obesity, diabetes, high blood pressure and raised cholesterol) is common in mid-life (CMO annual report: volume one 2011. On the state of the public's health Chief Medical Officer 2012). Among men, the proportion having 4 or more risk factors is greatest for those aged 55–64 (21.4%). Among women, the proportion with 4 or more risk factors is greatest in those aged 65–74 (16.2%) (CMO annual report: volume one 2011. On the state of the public's health Chief Medical Officer 2012).

Between 2003 and 2008, the greatest reduction in the number of adults in the general population displaying 4 behavioural risk factors (smoking, lack of physical activity, consuming alcohol, and poor diet) was seen in higher socioeconomic and more highly educated groups. People from unskilled households are more than 3 times more likely to adopt behavioural risk factors that put them at greater risk than people in professional groups (Clustering of unhealthy behaviours over time. Implications for policy and practice The King's Fund 2012).

Life expectancy continues to increase in the UK, but this increase is not necessarily extra years spent in good health and free of disability. By 2035, it is estimated that 23% of the population will be aged 65 or over (Health expectancies at birth and age 65 in the United Kingdom, 2008–10 Office for National Statistics 2012).

Estimates of life expectancy, healthy life expectancy and disability-free life suggest that, on average, a man of 65 will live a further 17.6 years but will face 7.7 years of ill health and 7.4 years with a disability towards the end of their life. On average, a woman of 65 will live a further 20 years but will have 8.7 years of ill health and 9 years with disability (Health expectancies at birth

and age 65 in the United Kingdom, 2008–10, Office for National Statistics 2012).

The incidence of dementia increases with age. Increases in life expectancy and in the proportion of older people in the UK population suggest that dementia incidence would also rise. However, data suggests that the incidence of dementia in 2011 was lower than had been predicted from the1991 data. This finding is consistent with findings from other high income countries. The lower incidence is attributed to a reduction in risk factors, for example smoking, and societal changes such as better education (Matthews et al. 2013).

However, in 2012 around 800,000 people in the UK were living with some form of dementia. More than 17,000 of these people were under 65. Around 11,500 people were from black and minority ethnic groups. Family and friends were acting as primary carers for about 670,000 people. In 2012 the annual cost of dementia to the NHS, local authorities and families was estimated to be £23 billion (Alzheimer's Society's Dementia 2012 report).

In 2011/12 it was estimated that more than 11 million adults in the UK were disabled. Of that total, 5.3 million were over the then state pension age (for women this was 60 and over, for men 65 and over) (Family resources survey, United Kingdom 2011/12 Department for Work and Pensions 2013). Disabled adults in the UK are twice as likely to be living in poverty as non-disabled adults. Disabled people's day-to-day living costs are 25% higher than those of non-disabled people (Disability in the United Kingdom 2012 Papworth Trust 2012).

Having 2 or more chronic conditions (multimorbidity) is common among people aged 65 and older. However, there are more people under 65 than over 65 with multimorbidity (Barnett et al. 2012, Agborsangaya et al. 2012). Multimorbidity is associated with low socioeconomic status, and it can begin 10–15 years earlier in people living in the most deprived areas than in those living in the most affluent ones (Barnett et al. 2012). Multimorbidity is also

associated with low educational attainment (Nagel et al. 2008). Therefore, risk reduction may need to occur earlier in life in some disadvantaged groups.

4 Considerations

This section describes the factors and issues the Public Health Advisory Committee (PHAC) considered when developing the recommendations. Please note: this section does **not** contain recommendations (see Recommendations).

General considerations

4.1 The PHAC acknowledged that there are different types of dementia and a wide range of disabilities. A number of health conditions and environmental circumstances can contribute to dementia, disability and frailty. The behavioural risk and protective factors covered in the guideline will not be the same for all types of dementia, disability and frailty so risk reduction may be more effective for some than others.

4.2 Dementia, disability and frailty are not inevitable consequences of ageing. The PHAC was satisfied that there is sufficient evidence to show the risk of developing them can be reduced through changing common behavioural risk factors. This includes quitting smoking, reducing sedentary behaviour and increasing physical activity, reducing alcohol consumption, having a healthy diet, and reaching and maintaining a healthy weight. However, key messages about risk reduction, particularly for dementia, are not well publicised or understood by health and other professionals or the public, unlike the link between smoking and cancer.

4.3 The PHAC was aware that people often have more than one behavioural risk factor. They agreed an order of importance of risk factors in the guideline based on the strength of the associations reported in Expert testimony 1. However, the PHAC also agreed that the most appropriate approach will come from people working

with health and social care professionals to consider their own needs along with contextual and local factors.

4.4 Mid-life is not too late for people to make meaningful changes. People often need more than one attempt to change, and mid-life can be the period in which change is finally sustained. The PHAC agreed, based on the evidence, that mid-life changes (supported by professionals and services) can help to reduce the risk of dementia, disability and frailty.

4.5 The PHAC recognised that mid-life is not the only time to make changes to smoking, physical activity, alcohol intake and diet, and that these issues are important throughout life: the earlier healthy behaviours are adopted the more likely a person is to have more years free from illness, disability and frailty.

4.6 The PHAC agreed that putting policies and services in place to encourage change in relevant behaviours could have huge benefits for individuals, families and the population as a whole.

4.7 The PHAC heard expert evidence that population approaches are more cost effective for reducing deaths from non-communicable chronic diseases than individual approaches. In particular, reductions in smoking led to dramatic reductions in cardiovascular disease, lung cancer and chronic obstructive pulmonary disease. It considered that population approaches are therefore key to helping people reduce exposure to risk factors.

4.8 The PHAC agreed that individual behaviour change approaches are likely to be more cost effective and less likely to widen health inequalities when supported by population-based approaches. NICE public health guideline 49 makes recommendations on effective and cost-effective behaviour change techniques for working with individuals.

4.9 People are more likely to make healthy choices and change their behaviour when basic needs (for example, housing or employment) are addressed. Therefore other local authority services such as housing and planning can have an effect on risk factors.

4.10 The PHAC agreed that interventions and services should be accessible to the whole community, particularly the more disadvantaged. If the availability of interventions is limited it is unlikely that they will improve health inequalities. Equity issues, such as language skills, information content or service location and opening hours or lack of internet access may all affect accessibility. In turn, these factors will affect the effectiveness and cost-effectiveness of services.

4.11 Raising awareness of the links between risk factors and dementia, disability and frailty is unlikely to be enough to change people's behaviour alone, because knowledge does not always lead to action. There is also a risk of widening health inequalities because more educated people and those with greater self-efficacy tend to act on information more readily.

4.12 The PHAC noted that changes in the unhealthy behaviours covered in the guideline could also reduce the incidence of other non-communicable diseases and conditions. In addition other household members may benefit from behavioural change (for example from less exposure to second-hand smoke or a healthier diet).

4.13 Children and young people are influenced by what they see. By changing their own smoking, physical activity, drinking and dietary behaviours, people in mid-life may positively influence children and young people and consequently their health.

The evidence

4.14 The evidence reviews developed to inform this guideline focused on the referral from the Department of Health and the scope questions. The reviews included primary studies and systematic reviews that investigated interventions and services that were explicitly aimed at mid-life populations and at vulnerable and disadvantaged adult populations. There is a broader evidence base that includes the general population as well as people in mid-life that could have been used when developing this guideline. However, including the general population in the reviews would have made them unmanageable in the time and resources available.

4.15 Literature searching without mid-life filters gave more than a million results, so a search strategy was developed to identify evidence that was specific to people in mid-life. Studies of people in mid-life that did not include mid-life terms in the title or abstract may not have been found using this strategy. However, the inclusion of recent systematic reviews is likely to mean much of this literature was covered. The review team noted that the primary study participants in many reviews were in mid-life, although there was no mention of a focus on mid-life.

4.16 The wider evidence base has been used across multiple topic-specific NICE public health guidelines; when appropriate, the PHAC considered other relevant recommendations. The decision whether or not to cross-refer to or include recommendations from other NICE guidelines was based on the PHAC's view of whether evidence from the general adult population could be applied to people in mid-life. This wider evidence base was also the subject of testimonies from a range of experts, detailed in The evidence.

4.17 Any lack of evidence in the commissioned reviews should not be interpreted as suggesting that a particular behaviour does not have a role in the development of or protection against dementia,

disability and frailty. Nor should it be inferred that there is no evidence of its effectiveness. Instead, it implies that there is a lack of evidence exclusive to mid-life. When recommendations have been made the PHAC members used their expert judgment about the applicability and relevance of interventions.

4.18 The early onset of non-communicable chronic diseases and early mortality in disadvantaged groups was considered at the scoping stage of the guideline. To address this, the lower age limit for inclusion of evidence in the reviews was reduced so data were included from adults aged 39 and younger from vulnerable and disadvantaged groups.

4.19 The guideline focused on primary prevention, therefore the management of obesity was considered to be not covered by the scope. However, evidence relating to change in weight and BMI from the normal range to overweight or underweight was considered.

4.20 Only a limited amount of vision and hearing loss literature was found that reported dementia, disability and frailty outcomes. – Where it was reported, there was little evaluation of the effect of mid-life interventions on preventing the loss. This is relevant to this guideline because vision and hearing problems are risk factors for dementia, disability and frailty because they affect people's ability to be involved in their own medical care. They can also make related issues, such as social isolation and depression, worse.

4.21 The PHAC received expert testimony on sleep disorders and their link with mild cognitive impairment, dementia and other non-communicable chronic diseases such as diabetes and Parkinson's disease. Particular groups of people may be at high risk of non-communicable chronic diseases as a result of disordered sleep, for example shift workers and people with untreated sleep apnoea. Sleep apnoea adversely affects cognitive function; NICE has

produced guidance on its management. (See Continuous positive airway pressure for the treatment of obstructive sleep apnoea/hypopnoea syndrome NICE technology appraisal guidance 139 and Radiofrequency ablation of the soft palate for snoring NICE interventional procedure guidance 476.) The PHAC considered the evidence for other sleep interventions to reduce the risk of dementia and other non-communicable chronic diseases was insufficient to make recommendations, but has made a research recommendation.

4.22 There is emerging evidence on the importance of psychosocial risk factors throughout life such as loneliness, isolation and depression. These factors may reduce resilience to disease onset and progression. There may also be some protective factors, such as high levels of education. Expert testimony suggested that people with high education levels appear to have greater resilience to dementia. However, there is a lack of evidence on the most effective ways to address psychosocial factors and on their effect on the development of dementia, disability and frailty. Psychosocial factors may be as important as physical factors in reducing the risk of dementia, but more evidence is needed. The group therefore made a research recommendation in this area.

4.23 Sexual health was not included in the search strategy because of the need to prioritise the areas covered due to time and resource constraints. However, sexual health matters (for example safe sex and contraceptive advice) are still issues for both men and women in mid-life.

4.24 The PHAC was aware of the limitations of the economic analysis. This focused on dementia outcomes resulting from the effect of physical activity alone. This approach was taken because time, resources and the evidence available did not allow extensive economic analyses. Also, existing economic models for tobacco and alcohol in other NICE guidance demonstrate cost-

effectiveness. PHAC members were confident that changing multiple behaviours was likely to result in further benefits.

4.25 The model demonstrated the potential cost effectiveness of population-level interventions using a cohort of people aged 40. Population-level interventions would have a beneficial impact on the whole population, so a model based only on a mid-life cohort is a conservative estimate of the total benefit.

4.26 The physical activity model showed the potential for adding healthy years to life as a result of a small change from no activity (sedentary) to low–moderate activity. Because of living longer, some people who otherwise would have died earlier will go on to develop dementia. However, the model shows that the net overall effect of an intervention to increase physical activity is to decrease the prevalence of dementia, to increase life expectancy and to reduce the average length of disability.

4.27 People who increase physical activity not only reduce the probability of developing dementia, but also the probability of developing cardiovascular disease and cancer.

4.28 The initial costs in the UK of an intervention to increase physical activity will mostly be met by local government, although risk reduction campaigns would be more efficient at national government level. The campaign costs would therefore move to this level of government. The overall future effect on costs will be to substantially reduce NHS and social care costs (the latter mainly met by local authorities). The model estimates that even after discounting future costs and after subtracting the costs of implementing the intervention there will be a net cost saving to local authorities. However, these cost savings will be in the future.

4.29 The economic model estimates that the biggest gains in reducing dementia come from interventions that raise physical activity levels from sedentary to low-level activity, and that the gains from raising

activity levels beyond a low level are considerably smaller. However, this result relies on the relative risks for dementia applied to the physical activity categories in the model. There is currently no detailed information on the dose-dependent relationship between physical activity in mid-life and risk of developing dementia in later life. The study by Sofi et al. (2011) used in the base case analysis provided risk ratios for the onset of cognitive decline in people with high and low-to-moderate levels of physical activity compared with people who were sedentary. A sensitivity analysis was conducted using an alternative data source that suggests that targeting the inactive group as well as targeting the low active group will be cost saving. However, more detailed information on the association between physical activity and dementia would further improve the reliability of the model results.

4.30 The NHS Health Check programme is an opportunity for people to change behavioural risk in mid-life. The PHAC acknowledged the updating of the programme, the work to increase availability and use and the aim to take the programme directly to people. The members were concerned about the focus on vascular dementia and the limited acknowledgment of risk reduction for Alzheimer's and mixed dementias. In addition the group agreed that dementia information should be given to everyone eligible for a health check, whatever their age. The programme should include help for people to change behavioural risk factors as well as medical support to manage disease. Referral to support, preventive and care services as appropriate is an essential part of the NHS Health Check programme.

4.31 Social norms can affect behavioural risks. It is becoming less usual for people to smoke, and that is an important driver for change. Social norms also exist for other behaviours and need to be challenged. Drinking alcohol daily at home has become normal for some people, and this poses a threat to health. Reducing activity –

'slowing down' and having 'earned a rest' are often seen as an expected part of growing older. However, many people continue to be fully active in later life and take up and enjoy new activities and this is good for their health and well-being.

4.32 The PHAC was aware of the alcohol risk curve seen in the literature that shows a small risk for non-drinkers, a lesser risk for very low drinkers and increasing risk with increasing consumption of alcohol (however, the risk observed for non-drinkers is likely to be because this group includes former heavy drinkers; these people are likely to be experiencing ill health as a result of past drinking). The expert testimony suggested that there is no safe level of alcohol consumption.

4.33 Alcohol action teams and identification and brief advice are not always provided systematically and sufficiently scaled to address health inequalities. The PHAC was also aware that the advice given differs. It is important that all health and social care professionals are given training and information so they can take advantage of intervention opportunities and to make every contact count.

This section will be completed in the final document.

5 Recommendations for research

The Public Health Advisory Committee (PHAC) recommends that the following research questions should be addressed. It notes that ‘effectiveness’ in this context relates not only to the size of the effect, but also to cost effectiveness and duration of effect. It also takes into account any harmful or negative side effects.

All the research should aim to identify differences in effectiveness among groups, based on characteristics such as socioeconomic status, age, gender and ethnicity.

5.1 What are the most effective and cost-effective combinations of population-level measures to target people in mid-life to maintain or take up healthy lifestyle behaviours? What are the best methods for evaluating their effect?

5.2 What are the most effective and cost-effective mid-life services and interventions for reducing behavioural risk, leading to healthier ageing and preventing or delaying the development of dementia, disability and frailty in later life? How can these be delivered in a consistent and sustainable manner? How can multiple interventions be effectively packaged to maximize efficiency? What are the barriers and facilitators to the uptake of services and interventions, and to the development and maintenance of healthy behaviours of people in mid-life? What are the effects on health inequalities?

5.3 What is the prevalence of physical and psychosocial risk and protective factors, and what are the relationships between them and the development of dementia, disability and frailty? Are dose–response relationships evident and how strong are these? Which factors are independent and which mediate others?

5.4 How strong are the associations between sleep patterns and positive and negative health outcomes, in particular the development of dementia, disability and frailty? What are the most effective and cost-effective interventions to improve sleep and what is their effect on the development of dementia, disability and frailty?

5.5 How effective and cost-effective is the NHS Health Check programme? What are the patterns of uptake in relation to the demographics of the population and their degree of behavioural risk? What is the programme's effect on the development of dementia, disability and frailty? How feasible is extending the NHS Health Check programme to a younger age range?

5.6 What is the social patterning of dementia and how has it changed in the past 20 years? Which groups and individuals bear the largest burden in society?

More detail identified during development of this guideline is provided in Gaps in the evidence.

6 Related NICE guidance

Published

- Overweight and obese adults – lifestyle weight management NICE public health guideline 53 (2014).
- Behaviour change: individual approaches NICE public health guideline 49 (2014).
- Smoking cessation – acute, maternity and mental health services NICE public health guideline 48 (2013).
- BMI and waist circumference – black, Asian and minority ethnic groups NICE public health guideline 46 (2013).
- Tobacco harm reduction NICE public health guideline 45 (2013).
- Physical activity: brief advice for adults in primary care NICE public health guideline 44 (2013).
- Obesity – working with local communities NICE public health guideline 42 (2012).
- Walking and cycling NICE public health guideline 41 (2012).
- Preventing type 2 diabetes – risk identification and interventions for individuals at high risk NICE public health guideline 38 (2012).
- Preventing type 2 diabetes: population and community interventions NICE public health guideline 35 (2011).
- Prevention of cardiovascular disease NICE public health guideline 25 (2010).
- Alcohol-use disorders – preventing harmful drinking NICE public health guideline 24 (2010).
- Promoting mental wellbeing at work NICE public health guideline 22 (2009)

- Promoting physical activity in the workplace NICE public health guideline 13 (2008).
- Physical activity and the environment NICE public health guideline 8 (2008).
- Behaviour change: the principles for effective interventions NICE public health guideline 6 (2007).
- Workplace interventions to promote smoking cessation NICE public health guideline 5 (2007).
- Obesity NICE clinical guideline 43 (2006).
- Dementia NICE clinical guideline 42 (2006).
- Four commonly used methods to increase physical activity NICE public health guideline 2 (2006).
- Brief interventions and referral for smoking cessation NICE public health guideline 1 (2006).

Under development

- Exercise referral schemes NICE public health guideline. Publication expected September 2014.
- Oral health: local authority oral health improvement strategies NICE public health guideline. Publication expected October 2014.
- Excess winter deaths and illnesses NICE public health guideline. Publication expected January 2015.
- Maintaining a healthy weight and preventing excess weight gain among children and adults NICE public health guideline. Publication expected February 2015.
- Workplace policy and management practices to improve the health and wellbeing of employees NICE public health guideline. Publication expected May 2015.
- Oral health promotion approaches for dental health practitioners NICE public health guideline. Publication expected October 2015.
- Workplace health - older employees NICE public health guideline. Publication expected January 2016.

7 Glossary

Acceptable

Acceptability is the extent to which a certain behaviour is considered normal and acceptable within society as a whole or with in subpopulations. It is sometimes referred to as the social norm. It can be influenced by advertising, legislation, and culture.

Accessible

Accessibility is the ease with which a person can access a commodity, facility or service. It includes number and location, of facilities or outlets, their opening times, and the distance and ease of travel.

Affordable

Affordability measures include the use of taxation, pricing and subsidies to deter purchase of unhealthy commodities such as foods that have a high saturated fat and/or sugar content, cigarettes and alcohol, and to encourage the purchase of healthier options such as foods that are low in fat and sugar.

Disability

Any long-term restriction on a person's ability to perform an activity in the way, or within the range, considered normal. This may be because of limited body function or structure, or personal or environmental factors.

Frailty

When someone is at high risk of health problems including disability, having a fall or mortality. It can also involve dependency on others and the need for long-term care (Fried et al. 2004).

Sector-led improvement

A sector is responsible for its own performance and improvement through sharing best practice, and for leading the delivery of improved outcomes for local people. Accountability is primarily to local communities.

Successful ageing

Survival to an advanced age while maintaining physical and cognitive function, functional independence and a full and active life. Ill health and disability are compressed into a relatively short period before death (Fries et al. 2011).

Third sector

The part of civil society that comprises charities, community interest companies, voluntary and community organisations, social enterprises and co-operatives.

8 References

Agborsangaya CB, Lau D, Lahtinen M et al. (2012) Multimorbidity prevalence and patterns across socio-economic determinants: a cross-sectional survey. BMC Public Health 12: 201

Barnett K, Mercer SW, Norbury M et al. (2012) Epidemiology of multimorbidity and implications for health care, research and medical education: a cross-sectional study. The Lancet 380 (9836): 37–43

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Singh-Manoux A, Marmot MG, Glymour M et al. (2011) Does cognitive reserve shape cognitive decline? Annals of Neurology 70: 296–304

9 Summary of the methods used to develop this guideline

Introduction

The reviews, expert reports and economic modelling report include full details of the methods used to select the evidence (including search strategies), assess its quality and summarise it.

The minutes of the Public Health Advisory Committee (PHAC) meetings provide further detail about the Committee's interpretation of the evidence and development of the recommendations.

Guideline development

The stages involved in developing public health guidelines are outlined in the box below.

1. Draft scope released for consultation

2. Stakeholder comments used to revise the scope

3. Final scope and responses to comments published on website

4. Evidence reviews and economic modelling undertaken and submitted to PHAC

5. PHAC produces draft recommendations

6. Draft guideline (and evidence) released for consultation (and for fieldwork)

7. PHAC amends recommendations

10. Final guideline published on website

11. Responses to comments published on website

Key questions

The key questions were established as part of the scope. They formed the starting point for the reviews of evidence and were used by the PHAC to help develop the recommendations. The overarching questions were:

Question 1: Which mid-life behavioural risk factors are associated with successful ageing and the primary prevention or delay of dementia, non-communicable chronic conditions, frailty and disability? How strong are the associations? How does this vary for different subpopulations?

Question 2: What are the most effective and cost-effective mid-life interventions for increasing the adoption and continuation of healthy behaviours?

- To what extent do the different health behaviours prevent or delay dementia?
- To what extent do the different health behaviours prevent or delay frailty and disability related to modifiable behavioural risk factors?
- To what extent do the different health behaviours prevent or delay non-communicable chronic diseases?

Question 3: What are the key issues for people in mid-life that prevent or limit their adoption and continuation of healthy behaviours, and to what extent do they have an effect? How does this differ for subpopulations, for example by ethnicity, socioeconomic status or gender?

Question 4: What are the most effective ways of delivering interventions that increase the adoption and continuation of healthy behaviours in mid-life? For example, how do interventions targeting single versus multiple behaviours compare? How does effectiveness and cost effectiveness vary in relation to the recipient's demographic variables?

These questions were made more specific for each review.

Reviewing the evidence

Effectiveness reviews

One review of effectiveness and cost effectiveness was conducted.

- Review 3. Effectiveness and cost-effectiveness of mid-life interventions for increasing the uptake and maintenance of healthy lifestyle behaviours and the prevention or delay of dementia, disability, frailty and non-communicable chronic diseases related to modifiable lifestyle risk factors.

Identifying the evidence

Several databases were searched in September 2013 for systematic reviews, randomised controlled trials, controlled trials and economic evaluations dating from January 2000. See review 3.

Additional searches of electronic databases and the grey literature were carried for papers relevant to this review and also for the other 2 reviews.

The literature search for the effectiveness and cost-effectiveness review was updated in March 2014.

Selection criteria

Studies were included in the effectiveness and cost-effectiveness review if they focused on:

- adults at mid-life (aged 40–64 years for the general population or aged 18–39 in disadvantaged populations)
- effectiveness and cost-effectiveness outcomes for interventions to promote the uptake and maintenance of healthy behaviours that may have a positive effect on successful ageing or delay the start of dementia, disability and frailty and non-communicable diseases.

Studies were excluded if:

- they were not published in English
- they were from non-Organisation for Economic Co-operation and Development (OECD) populations
- they evaluated use of drugs and food supplements
- they focused on the diagnosis and management of dementia, disability and frailty and common non-communicable diseases, including management of obesity.

Inclusion and exclusion criteria for each review varied. See each review for details of the inclusion and exclusion criteria.

Other reviews

Two reviews of barriers, facilitators and associations were conducted. See:

- Review 1. Issues that prevent or limit the uptake and maintenance of healthy behaviours by people in mid-life (barriers and facilitators)
- Review 2. Behavioural risk factors in midlife associated with successful ageing and the primary prevention or delay of disability, dementia, frailty, and non-communicable chronic conditions.

One in-house pragmatic review was conducted. See:

- Review 4. Service delivery mid-life

Identifying the evidence

Review 1 and 2

Several databases were searched in September 2013 for systematic reviews, interventional, observational and qualitative studies for review 1 and longitudinal cohort studies for review 2, dating from January 2000.

Review 4

A targeted and pragmatic approach was taken to identifying the evidence, using the call for evidence, a specific request to the PHAC developing this guideline, re-screening of review 1 full text articles, and identification of previous reviews of healthy lifestyle programmes using in-house expertise of previous CPH guidance. The date limit for including studies was 31 December 2013, apart from PHAC submitted studies which were considered up to 21 February 2014. No limits on study type were imposed.

Selection criteria

Review 1 and 2

Studies were included in the reviews if they focused on:

- adults at mid-life (aged 40–64 years for the general population or aged 18–39 in disadvantaged populations).

Studies were excluded if:

- they were not published in English
- they focused on use of drugs and food supplements
- they focused on the diagnosis and management of dementia, disability and frailty and common non-communicable diseases, including management of obesity.

Review 4

Studies were included in the review if they focused on:

- people aged 40–64 years. The age range was lowered to include people aged 18–39 for disadvantaged groups
- evaluations of programmes that promote the uptake or maintenance of any programme that could be considered 'healthy lifestyle' delivered in a real-world UK setting
- provided a description of the service delivery factors that affected the uptake and maintenance of a programme, and other organisational factors such as staff and setting.

Studies were excluded if:

- they reported on the effectiveness of an intervention or the barriers and facilitators without any clear discussion of service delivery
- were conducted in a non-UK setting.

Quality appraisal

Included papers for reviews 1–3 were assessed for methodological rigour and quality using the NICE methodology checklist, as set out in Methods for the development of NICE public health guidance. A tool specifically designed to assess the quality of systematic reviews (AMSTAR) was used for reviews 1 and 3. Each study was graded (++, +, −) to reflect the risk of potential bias arising from its design and execution.

Study quality

++ All or most of the checklist criteria have been fulfilled. Where they have not been fulfilled, the conclusions are very unlikely to alter.

+ Some of the checklist criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are unlikely to alter the conclusions.

− Few or no checklist criteria have been fulfilled. The conclusions of the study are likely or very likely to alter.

The evidence was also assessed for its applicability to the areas (populations, settings, interventions) covered by the scope of the guideline. Each evidence statement concludes with a statement of applicability (directly applicable, partially applicable, not applicable).

Studies included in review 4 were not quality assessed because of the type of studies included and the pragmatic real-world nature of the review.

Summarising the evidence and making evidence statements

The review data were summarised in evidence tables (see the reviews in Supporting evidence).

The findings from the reviews and expert reports were synthesised and used as the basis for a number of evidence statements relating to each key question. The evidence statements were prepared by the external contractors (see 'Supporting evidence'). The statements reflect their judgement of the strength (quality, quantity and consistency) of evidence and its applicability to the populations and settings in the scope.

Cost effectiveness

There was a review of economic evaluations and an economic modelling exercise. See review 1 and 'Cost-effectiveness of interventions aimed at increasing physical activity to prevent the onset of dementia'.

Economic modelling

Assumptions were made that could underestimate or overestimate the cost effectiveness of the interventions (see review modelling report for further details).

An economic model was constructed to incorporate data from the reviews of effectiveness and cost effectiveness. The results are reported in: Cost-effectiveness of interventions aimed at increasing physical activity to prevent the onset of dementia.

How the PHAC formulated the recommendations

At its meetings in April and May 2104, the Public Health Advisory Committee (PHAC) considered the evidence, expert reports and cost effectiveness to determine:

- whether there was sufficient evidence (in terms of strength and applicability) to form a judgement
- where relevant, whether (on balance) the evidence demonstrates that the intervention, programme or activity can be effective or is inconclusive
- where relevant, the typical size of effect
- whether the evidence is applicable to the target groups and context covered by the guideline.

The PHAC developed recommendations through informal consensus, based on the following criteria:

- Strength (type, quality, quantity and consistency) of the evidence.
- The applicability of the evidence to the populations/settings referred to in the scope.
- Effect size and potential impact on the target population's health.
- Impact on inequalities in health between different groups of the population.
- Equality and diversity legislation.
- Ethical issues and social value judgements.
- Cost effectiveness (for the NHS and other public sector organisations).
- Balance of harms and benefits.
- Ease of implementation and any anticipated changes in practice.

Where possible, recommendations were linked to evidence statements (see The evidence for details). Where a recommendation was inferred from the

evidence, this was indicated by the reference ‘IDE’ (inference derived from the evidence).

10 The evidence

Introduction

The evidence statements from three reviews are provided by Cambridge Institute of Public Health. The summary points are from review four that was conducted in-house by NICE.

This section lists how the evidence statements and expert papers link to the recommendations and sets out a brief summary of findings from the economic analysis.

How the evidence and expert papers link to the recommendations

The evidence statements are short summaries of evidence, in a review, report or paper (provided by an expert in the topic area). Each statement has a short code indicating which document the evidence has come from.

Evidence statement number 1.3.1PA indicates that the linked statement is numbered 3.1 in review 1; the letters refer to the risk factors: PA for physical activity; DI for diet; SM for smoking, AL for alcohol; EC for Eye Care; H for health prevention interventions (in general). SP5 indicates that summary point 5 in review 4 is linked to a recommendation. EP7 indicates that expert paper 7 is linked to a recommendation.

Where a recommendation is not directly taken from the evidence statements, but is inferred from the evidence, this is indicated by IDE (inference derived from the evidence).

Recommendation 1: EP2, 3, 5, 6; IDE

Recommendation 2: evidence statements EP6; IDE

Recommendation 3: evidence statements 1.2.1SM, 1.3.1SM, 1.4.1SM, 1.4.2SM, 2.6.1SM, 2.6.3SM, 2.6.4SM, 2.6.5SM, 2.6.6SM, 2.6.7SM; EP2

Recommendation 4: evidence statements 1.4.1PA, 1.4.3PA, 1.7.8PA, 1.7.15PA, 2.3.3PA, 2.3.2PA, 2.3.3PA, 2.3.4PA, 2.3.5PA, 3.3.2PA; EP3

Recommendation 5: evidence statements 1.3.1AL, 1.3.2AL, 2.7.2AL; EP6

Recommendation 6: evidence statements 1.3.1DI, 1.3.5DI, 1.3.9DI 1.5.1DI, 1.5.2DI, 1.7.1DI, 2.5.1DI; EP2

Recommendation 7: evidence statements 3.3.2PA; EP5

Recommendation 8: evidence statements 1.2.2PA, 1.2.3PA, 1.2.4PA, 1.2.5PA, 1.2.10PA, 3.3.5PA; SP12

Recommendation 9: evidence statements 1.2.2PA, 1.2.3PA, 1.2.4PA, 1.2.5PA, 1.2.10PA, 2.3.3PA, 2.3.2PA, 2.3.3PA, 2.3.4PA, 2.3.5PA, 2.5.1DI, 2.6.1SM, 2.6.3SM, 2.6.4SM, 2.6.5SM, 2.6.6SM, 2.6.7SM, 2.7.2AL, 2.9.3LC, 3.3.1PA, 3.3.3PA, 3.3.5PA,3.3.7PA, 3.3.8PA, 3.5.1SM, 3.5.2SM, 3.9.1PA, 3.9.2PA; SP12; EP2, 3, 4

Recommendation 10: SP1; EP8; IDE

Recommendation 11: evidence statements 1.3.1H, 3.9.1PA, 3.9.2PA, 3.9.4SM; SP1, 3, 4, 5, 6, 7, 8, 9

Recommendation 12: evidence statements 1.5.4PA, 1.5.5PA, 3.3.3PA, 3.6.2AL

Recommendation13: evidence statements 1.3.1H; SP3, 4, 5, 6, 7, 8, 9, 10, 11

Recommendation 14: evidence statements 3.3.1PA, 3.3.3PA, 3.3.7PA, 3.3.8PA, 3.9.1PA, 3.9.2PA; SP1, 10, 11

Recommendation 15: SP1

Recommendation 16: evidence statements 1.2.10PA, 1.3.1PA, 3.3.2PA; SP10

Expert papers

Expert papers 1–9. See 'What evidence is the guideline based on?'.

Economic modelling

The model was exploratory in nature and as such did not report a single estimate of cost-effectiveness but presented a series of threshold analyses to see the conditions under which cost-effectiveness can be achieved.

Overall, the model found that population level and individual level interventions that aim to increase the physical activity of mid-life people have the potential to be highly cost-effective. Population level interventions were found to have a slightly greater potential of being cost-effective at lower thresholds of willingness to pay than individual level interventions when aimed at the general population. However, individual level interventions were found to be cost-effective at acceptable willingness to pay thresholds (below £20,000) when targeted at inactive people under certain assumptions.

The results for both types of intervention were varied extensively in a number of sensitivity and scenario analyses. The most crucial determinant for interventions to be cost-effective is whether people succeed in maintaining increased levels of physical activity over their lives. The dose-response relationship between physical activity in mid-life and risk of developing dementia in later life also influences the cost-effectiveness.

The specific scenarios considered and the full results can be found in Cost-effectiveness of interventions aimed at increasing physical activity to prevent the onset of dementia.

11 Gaps in the evidence

The Public Health Advisory Committee (PHAC) identified a number of gaps in the evidence related to the programmes under examination based on an assessment of the evidence. These gaps are set out below.

1. There is a lack of evidence on the relationship between psychosocial risk and protective factors in mid-life and the development of dementia, disability and frailty in later life, including cognitive and social activities. (Source: Expert paper 7; Evidence review 2)

2. There is a lack of evidence on the effectiveness and cost-effectiveness of interventions for people in mid-life to address behavioural and psychosocial risk factors and their long term impact on the prevention or delay of dementia, disability and frailty. (Source: Evidence review 3)

3. There is a lack of long-term follow up, retention data and reporting of disease and mortality outcomes and compression of morbidity data in studies evaluating the effect of interventions to increase uptake and maintenance of healthy behaviours. This should include following people into later life and people in care settings. This will support better detection of trends in dementia prevalence and incidence in a way which can be related to changes in risk factors and protective factors. (Source: Evidence review 3)

4. There is a lack of evidence on the clustering of the different physical and psychosocial risk factors, the relationships between the risk factors, compensatory behaviours when a risk factor is changed and which risk factor(s) to address first. (Source: Evidence review 2)

5. There is a lack of evidence on the effectiveness and cost-effectiveness of interventions to prevent and manage hearing and visual loss on the development of dementia. (Source: Evidence review 3)

6. There is a lack of evidence on the associations of sleep disorders and the development of dementia, disability and frailty and the effectiveness and cost-effectiveness of interventions to improve sleep. (Source: Expert paper 4; Evidence review 2)

7. There is a lack of evidence on the effectiveness and cost-effectiveness of interventions in mid-life to prevent falls in later life. (Source: Evidence review 3)

8. There is a lack of evidence on the effectiveness and cost-effectiveness, and acceptability of different ways of communicating risk to increase the person's understanding of their risk and to motivate them to make changes.

9. There is a lack of evidence on whether dementia can truly be preventable or whether it is only the onset that can be delayed, and on which types of dementia are most influenced by modifiable risk factors. (Source: Expert paper 8)

10. There is a lack of evidence on the effect of the NHS Health Check Programme on the prevention or delaying of dementia, disability and frailty. (Source: Expert paper 9)

11. There is a lack of evidence on the effectiveness and cost-effectiveness of nudge interventions and financial incentives for changing behaviours that increase risk, and the impact on dementia, disability and frailty outcomes. (Source: Evidence review 3)

12. There is a lack of population surveys that are designed to detect trends in dementia disease prevalence and incidence, and to relate these to changes in behavioural risk factors and protective factors.

12 Membership of the Public Health Advisory Committee and the NICE project team

Public Health Advisory Committee D

NICE has set up several Public Health Advisory Committees (PHACs). These standing committees consider the evidence and develop public health guidelines. Membership is multidisciplinary, comprising academics, public health practitioners, topic experts and members of the public. They may come from local government, the NHS, education, social care, environmental health, or the voluntary sector. The following are members of PHAC D:

Chair

John Britton

Professor of Epidemiology, Division of Epidemiology and Public Health, University of Nottingham

Core members

Paul Aveyard

Professor of Behavioural Medicine, Department of Primary Care Health Sciences, University of Oxford

Charlie Foster

Programme leader, BHF HPRG, Department of Public Health, University of Oxford

Jane Leaman

Divisional Consultant in Public Health Programme Improvement and Delivery, Health and Well Being Directorate, Public Health England

Susie Morrow

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Gillian Orrow

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Clinical Senior Lecturer in Public Health, School of Health and Related Research, University of Sheffield

Dagmar Zeuner

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Topic members

Gary Bickerstaffe

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David Croisdale-Appleby

Chair, Skills for Care

Janet Henson

Project Organiser and Tutor, Workers' Educational Association

Robin Ireland

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Louise Lafortune

Senior Research Associate, Cambridge Institute of Public Health, University of Cambridge

Jane Landon

Deputy Chief Executive, UK Health Forum

Expert testimony to PHAC

Oliver Mytton

Honorary Specialty Registrar, UK Health Forum, London

Ian Gilmore

Consultant Physician and Gastroenterologist, Royal Liverpool University Hospitals; Honorary Professor, Department of Medicine, University of Liverpool

Linda Bauld

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Simon Capewell

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Colin Mitchell

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Editor

About this guideline

What does this guideline cover?

The Department of Health (DH) asked the National Institute for Health and Care Excellence (NICE) to produce this guideline on Dementia, disability and frailty in later life – mid-life approaches to prevent or delay the onset of these conditions (see the scope).

This guideline does not provide detail on the diagnosis of, or cover treatments for dementia, disability and frailty (see Related NICE guidance for other recommendations that may be relevant to the prevention of dementia, disability and frailty).

The absence of any recommendations on interventions that fall within the scope of this guideline is a result of lack of evidence. It should not be taken as a judgement on whether they are cost effective.

How was this guideline developed?

The recommendations are based on the best available evidence. They were developed by the Public Health Advisory Committee (PHAC).

Members of the PHAC are listed in Membership of the Public Health Advisory Committee and the NICE project team.

For information on how NICE public health guidelines are developed, see the NICE public health guideline process and methods guides.

What evidence is the guideline based on?

The evidence that the PHAC considered included:

- Evidence reviews:
  - Review 1 'Issues that prevent or limit the uptake and maintenance of healthy behaviours by people in mid-life (barriers and facilitators)' was

carried out by Cambridge Institute of Public Health, University of Cambridge. The principal authors were: Louise Lafortune, Sarah Kelly, Steven Martin, Isla Kuhn, Andy Cowan, Carol Brayne.

  - Review 2 ‘Behavioural risk factors in midlife associated with successful ageing and the primary prevention or delay of disability, dementia, frailty, and non-communicable chronic conditions’ was carried out by Cambridge Institute of Public Health, University of Cambridge. The principal authors were: Louise Lafortune, Sarah Kelly, Steven Martin, Olivia Remes, Isla Kuhn, Andy Cowan, Carol Brayne.
  - Review 3 ‘Effectiveness and cost-effectiveness of midlife interventions for increasing the uptake and maintenance of healthy lifestyle behaviours and to what extent do the different health behaviours prevent or delay dementia, disability, frailty and non-communicable chronic diseases related to modifiable lifestyle risk factors’ was carried out by Cambridge Institute of Public Health, University of Cambridge. The principal authors were: Louise Lafortune, Sarah Kelly, Steven Martin, Isla Kuhn, Andy Cowan, Carol Brayne.
  - Review 4 ‘Models of delivery of programmes that aim to increase the uptake and maintenance of healthy lifestyle behaviours in mid-life’ was carried out by the Centre for Public Health, NICE. The principal author was Claire McLeod.
- Economic modelling ‘Cost-effectiveness of interventions aimed at increasing physical activity to prevent the onset of dementia’ was carried out by The Institute for Health Policy and Management, Erasmus University, Rotterdam. The principal authors were: Pieter van Baal, Martine Hoogendoorn.
- Expert papers
  - Expert paper 1, by Oliver Mytton, UK Health Forum, London
  - Expert paper 2, by Ian Gilmore, Royal Liverpool University Hospitals; Honorary Professor, Department of Medicine, University of Liverpool.
  - Expert paper 3, by Linda Bauld, Institute for Social Marketing University of Stirling
  - Expert paper 4, by Adrian Williams, Guys & St Thomas Hospital, London

- Expert paper 5, by Simon Capewell, Institute of Psychology, Health and Society, University of Liverpool
- Expert paper 6, by Colin Mitchell, Centre for Health, Law and Emerging Technologies, Nuffield Department of Population Health, University of Oxford
- Expert paper 7, by Carol Brayne, Institute of Public Health, Department of Public Health and Primary Care, School of Clinical Medicine, University of Cambridge
- Expert paper 8, by Jamie Waterall, Public Health England
- Expert paper 9, by Oliver Mytton, UK Health Forum, London

Note: the views expressed in the expert papers above are the views of the authors and not those of NICE.

In some cases the evidence was insufficient and the PHAC has made recommendations for future research. For the research recommendations and gaps in research, see Recommendations for research and Gaps in the evidence.

Status of this guideline

This is a draft guideline. The recommendations made in section 1 are provisional and may change after consultation with stakeholders.

This document does not include all sections that will appear in the final guideline. The stages NICE will follow after consultation are summarised below.

- The Committee will meet again to consider the comments, reports and any additional evidence that has been submitted.
- After that meeting, the Committee will produce a second draft of the guideline.
- The draft guideline will be signed off by the NICE Guidance Executive.

The key dates are:

- Closing date for comments 5 September 2014.

- Next PHAC meeting: 8 and 9 October 2014.

All healthcare professionals should ensure people have a high quality experience of the NHS by following NICE's recommendations in Patient experience in adult NHS services.

All health and social care providers working with people using adult NHS mental health services should follow NICE's recommendations in Service user experience in adult mental health.

The recommendations should be read in conjunction with existing NICE guidance unless explicitly stated otherwise. They should be implemented in light of duties set out in the Equality Act 2010.

NICE produces guidance, standards and information on commissioning and providing high-quality healthcare, social care, and public health services. We have agreements to provide certain NICE services to Wales, Scotland and Northern Ireland. Decisions on how NICE guidance and other products apply in those countries are made by ministers in the Welsh government, Scottish government, and Northern Ireland Executive. NICE guidance or other products may include references to organisations or people responsible for commissioning or providing care that may be relevant only to England.

Implementation

NICE guidelines can help:

- Commissioners and providers of NHS services to meet the requirements of the NHS outcomes framework 2013–14. This includes helping them to deliver against domain 1: preventing people from dying prematurely.
- Local health and wellbeing boards to meet the requirements of the Health and Social Care Act (2012) and the Public health outcomes framework for England 2013 to 16.
- Local authorities, NHS services and local organisations determine how to improve health outcomes and reduce health inequalities during the joint strategic needs assessment process.

NICE will develop tools to help organisations put this guideline into practice. Details will be available on our website after the guideline has been issued.

Updating the recommendations

This section will be completed in the final document