NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

DRAFT GUIDELINE

Sunlight exposure: communicating the benefits and risks to the general public

What is this guideline about?

This guideline makes recommendations on communicating the benefits and risks of sunlight to people's health and wellbeing. It will complement NICE's guideline on vitamin D: increasing supplement use among at-risk groups. The aim is to:

- Give people a better understanding of the various risks and benefits of exposure to sunlight so they know how to modify their behaviour.
- Reduce deaths and disease from malignant non-melanoma and melanoma skin cancer caused by UV exposure.
- Reduce disease from vitamin D deficiency caused by a lack of UV exposure. Note: vitamin D interventions that do not involve sunlight are beyond the remit of this guideline.

Background

Sunlight comprises infrared, visible and ultraviolet (UV) rays. This guidance focuses on UV rays, specifically UVA and UVB rays.

UVB helps the skin form vitamin D. This is essential for skeletal growth and bone health and is the main physical health benefit from sunlight exposure. Improved mental wellbeing is also associated with sunlight – but generally this is to do with the visible, rather than the UV component.

Research suggests there may be other benefits, for example, protection against chronic diseases such as cancer, heart disease and diabetes

(Consensus vitamin D position statement Cancer Research UK). But there is no scientific consensus on this.

The main short-term risk from overexposure to UV rays (both UVA and UVB) is sunburn (damage to the skin's DNA that can lead to skin cancer). The main long-term risk is skin cancer, either built up gradually over a lifetime or due to short bursts of high exposure. In addition, overexposure can age the skin leading, for example, to wrinkling. It can also damage the eyes.

The benefits and risks depend on a number of variables, including environmental, biological and behavioural factors. (Examples include: geographical location, time of day and year, weather conditions, natural skin colour and how long people spend in the sun.)

This makes it impossible to create one simple, definitive message for everybody. However, it is important to ensure general messages are consistent.

Who this guideline is for

The guideline is for commissioners, managers and practitioners with public health or social care as part of their remit working within the NHS, local authorities and the wider public, private, voluntary and community sectors. (For further details, see Who should take action?)

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

Contents

What is this guideline about? 1

Contents 3

1 Draft recommendations 4

2 Who should take action? 15

3 Implementation: getting started 16

4 Context 18

5 Considerations 21

6 Recommendations for research 28

7 Related NICE guidance 29

8 Glossary 30

9 References 32

10 Summary of the methods used to develop this guideline 32

11 The evidence 41

12 Gaps in the evidence 43

13 Membership of the Public Health Advisory Committee and the NICE project team 44

About this guideline 48

1 Draft recommendations

This guideline replaces recommendations 1–5 in Skin cancer prevention: information, resources and environmental changes NICE guideline PH32 (2011).

Policy and strategy

Recommendation 1 Work in partnership to develop policies and strategies to protect the public from under- or overexposure to sunlight

Public Health England and directors of public health should:

- Advise commissioners and senior managers to adopt a consistent, multiagency approach to make people aware of the benefits and risks of sunlight exposure.
- Work with commissioners and senior managers in local authorities and the NHS, council leaders, elected members, public health teams, local businesses and voluntary and community organisations to:
  - identify local opportunities to increase public awareness about the benefits and risks of sunlight exposure
  - address local needs, as identified by the joint strategic needs assessment and other local data
  - ensure the messages follow recommendations 6–9
  - target health, public health, social care and other practitioners in contact with at-risk groups (see recommendation 3)
  - carry out culturally appropriate activities (for example, to develop messages that resonate with the community).
- Advise commissioners and senior managers working with local and national media on how to present a balanced view of the health benefits and risks of sunlight exposure.
- Advise commissioners and senior managers to work with local and national organisations to achieve a consensus on the content of messages (see recommendations 6–9).

- Help commissioners and senior managers to establish clear, measurable objectives for prevention activities.
- Evaluate the effect of prevention activities (either one-to-one or group-based) using a range of measures of knowledge, attitudes, awareness and behaviour. (See NICE's guideline on behaviour change: the principles for effective interventions.)

Recommendation 2 Develop policies and strategies to protect the public from under- or overexposure to sunlight

Managers and health, public health and social care practitioners with a duty of care for others (for example, those in the workplace, education or residential or day care settings) should:

- Develop policies to promote the benefits and risks of sunlight exposure. Policies should:
  - adopt a balanced approach and avoid scaremongering (see recommendations 6–9)
  - advocate tailoring advice according to skin type and age, as well as the physical and mental ability of recipients
  - cover everyone's needs, including the needs of people from lower socioeconomic groups and those with specific cultural needs or a physical or mental disability
  - encourage people to manage their own risk, for example, by seeking shade and wearing protective clothing as well as sunscreen (see recommendations 5 and 6)
  - outline the benefits to those with a duty of care, for example, in the case of employers this could be fewer days absenteeism because of sunburn or other adverse effects (Sun protection: advice for employers of outdoor workers Health and Safety Executive).
- Ensure the policy states that information should:
  - be communicated using a range of approaches for example, one-to-one as well as group communication
  - as a minimum, be clearly displayed in communal locations

- be available in a variety of formats for recipients with different physical and mental abilities
- help people and their carers identify their own potential benefits and risks from sunlight exposure
- stress the importance of sun protection and describe in detail what this means (see recommendations 6 and 7)
- address popular misconceptions about sunlight exposure and having a tanned skin.

Planning

Recommendation 3 Identify groups, behaviours and activities that put people at risk of under- or overexposure to sunlight

Health, public health and social care commissioners should:

- Use local, regional and national epidemiological data and demographic and risk assessments to identify which groups, behaviours or activities put people at risk of under- or overexposure to sunlight. They should also identify the barriers preventing people from changing their behaviour.
- Be aware that groups at higher risk of skin cancer include:
  - people with lighter skin as they burn more easily than those with darker skin
  - children (babies are at particular risk of burning)
  - young people
  - outdoor workers
  - people who are immunosuppressed (that is, they have less resistance to skin problems as a result of disease, drugs or surgery)
  - people with a personal or family history of skin cancer (even if their natural skin colour is darker than that of the family member who had cancer)
  - people with many moles
  - people who put themselves at risk of UV overexposure, for example by sunbathing.

- Be aware that groups at higher risk of having a low vitamin D status include:
  - infants and children under 5 years
  - all pregnant and breastfeeding women, particularly teenagers and young women
  - people aged over 65
  - people who have little or no exposure to the sun, for example because of cultural or medical reasons, or who are housebound or otherwise confined indoors for long periods
  - people who have darker skin, for example, people of African, African–Caribbean and South Asian family origin.

Awareness-raising

Recommendation 4 Use any opportunity to raise awareness among at-risk groups of the benefits and risks of sunlight exposure

Health, public health and social care practitioners should:

- Whenever the opportunity arises, make people aware of the benefits and risks of sunlight exposure and what they can do to increase the benefits and reduce the risks. For example, the opportunity may arise if you see someone with sunburn, or who may be confined indoors for long periods.
- Think about providing one-to-one and group-based advice, tailored to the type of risks the person or group faces (see recommendations 8 and 9).
- Use existing community health promotion programmes or services to raise awareness of the benefits and risks of sunlight exposure.
- Follow the principles of behaviour change when conveying sunlight exposure messages. (See NICE's guideline on behaviour change: the principles for effective interventions.) This includes ensuring messages:
  - clearly specify the recommended actions
  - clearly explain that the actions will increase the benefits of, or reduce the risks from, sunlight
  - try to enhance people's belief in their ability to adopt the recommended actions.

- Encourage and support people at increased risk of low vitamin D status or skin cancer to contribute to awareness-raising activities.

Recommendation 5 Commission national and local mass media campaigns on the benefits and risks of sunlight exposure

Health and public health commissioners should:

- Develop, deliver and sustain national and local media campaigns to raise awareness of the benefits and risks of sunlight exposure. Campaigns should:
  - Present a balanced picture of the health benefits and risks. For example, a skin cancer prevention campaign should also mention the risk of under- exposure.
  - Outline what different groups should do to maximise the benefits and minimise the risks (see recommendations 8–9).
  - Ensure messages are simple, succinct and in line with recommendations 6–9. This includes addressing common misconceptions about the benefits and risks.
  - Be delivered in a way that meets the target audience's preferences (for example, use radio, new media, texts, posters or leaflets).
  - Be displayed at prominent locations for example, airports, schools, travel vaccination clinics, leisure and sporting events.
  - Be repeated over time and regularly altered to keep the audience's attention.
  - Be timed for maximum effect (for example, during dates when people are more likely to go on holiday such as Easter, Christmas, bank and school holidays).
- Ensure the format and content of national campaigns are developed and piloted with the target audience. If feasible, do the same for local activities.
- Ensure the campaigns tackle health inequalities by taking into account cultural, religious and group norms about sunlight exposure. Messages should be delivered in acceptable formats and media for different groups and written in languages spoken locally.

- Develop resources that are downloadable from a central website and easy to adapt for local use by a range of agencies, to ensure a consistent message and to minimise duplication of effort.
- Integrate and coordinate campaign messages with existing national and local health promotion programmes or services to keep costs as low as possible. (Examples of initiatives they could be integrated with include Sure Start and Change4Life.)
- Evaluate the effect, using a range of measures of knowledge, attitudes, awareness and behaviour. (For recommendations on the principles of evaluation see NICE's guideline on behaviour change: the principles for effective interventions.)

Recommendation 6 Offer general advice about how to benefit from, and stay safe in, sunlight

Health, public health and social care practitioners should offer general advice about how to maximise the benefits and minimise the risks of sunlight exposure as follows:

- Whenever the opportunity arises:
  - explain how people can work out their level of risk and how they may benefit (see recommendations 8–9)
  - explain that exposing relatively small areas of skin (such as forearms and hands) when in the sun for short periods can provide vitamin D
  - explain that prolonged exposure (for example, leading to burning or dark tanning) is not an efficient way to gain vitamin D
  - advise people to go out in the sunlight for short periods (less than the time it takes for skin to redden or burn) between 11am and 3pm from the beginning of April to mid-October[1] in the UK
  - explain the importance of checking the skin regularly for any changes (such as changes to moles that occur over weeks or several months) and where to go for further advice if they detect changes.

[1] SACN is currently reviewing this time period.

- Advise everybody (in particular, outdoor workers – see recommendation 7) to protect their skin when out in bright sunlight for more than a short period of time, both in the UK and abroad, by:
  - If possible, wearing clothing that protects areas that may be vulnerable to burning and by applying sunscreen. Protective clothing includes a broad-brimmed hat that shades the face, neck and ears, a long-sleeved top and trousers in close-weave fabrics that don't allow sunlight through.
  - Being aware that skin that has less previous sunlight exposure (for example, the back) is more likely to burn so extra care should be taken.
- Ensure people know that the strength of UV rays in sunlight varies according to where they are. Explain that:
  - UV rays are stronger when the sun is high in the sky and at higher altitudes
  - UV rays get through very cloudy skies but are not so strong
  - snow, sand, concrete and water reflect UV rays so people need to protect themselves from this additional exposure.
- Make people aware that tanned skin is an indicator of possible skin damage.
- Advise people to wear sunglasses that have wraparound lenses or wide arms to provide side protection and have at least 1 of the following:
  - the CE Mark and British Standard (BS EN 1836:2005)
  - a UV 400 label
  - 100% UV protection.

Recommendation 7 Offer sunscreen advice

Health, public health and social care practitioners should:

- Advise people who may be out in the sun long enough to burn to:
  - Apply sunscreen (at least sun protection factor [SPF] 15) to exposed areas of skin half an hour before, and shortly after going out in the sun. This includes the face, neck and ears (and head if someone has thinning or no hair, though a hat is far better and more convenient).
  - Reapply sun screen at least every 2–3 hours and straight after being in water (even if it is 'water-resistant') and also after towel drying.

- Tell people:
  - Sunscreen is not a safe alternative to clothing and shade but, rather, offers additional protection. No sunscreen offers 100% protection against sunlight.
  - To use sunscreen that offers both UVA and UVB protection: at least SPF15 to protect against UVB and at least 4-star UVA protection (if applied properly and regularly, SPF15 should be enough).
  - To use sunscreen that is water resistant if sweating or contact with water is likely.

Tailored advice

Recommendation 8 Offer advice tailored to people's age

Health, public health and social care practitioners should advise people that the benefits and risks from sunlight exposure are influenced by their age, as follows:

- Babies should be kept out of direct sunlight and their parents and carers should be given advice on vitamin D supplements (see NICE's guideline on vitamin D: increasing supplement use among at-risk groups).
- Infants and children in the UK should be kept in the shade as much as possible between 11am and 3pm, from the beginning of April to mid-October[1]. Parents and carers of those under 5 years should be given advice on vitamin D supplements (see NICE's guideline on Vitamin D: increasing supplement use among at-risk groups).
- Older people should:
  - be encouraged to go out in sunlight for short periods (less than the time it takes for skin to redden or burn) between 11am and 3pm, from the beginning of April to mid-October[2] in the UK
  - expose at least the forearms and hands (or similar amounts of skin)
  - minimise the risks by avoiding excessive or prolonged sunlight exposure

[2] SACN is currently reviewing this time period.

- be given advice on vitamin D supplements (see NICE's vitamin D guideline).

Recommendation 9 Offer advice tailored to people's natural skin colour

Health, public health and social care practitioners should advise people that the benefits and risks from sunlight exposure are influenced by their natural skin colour, as follows:

- Tell people with naturally darker skin (that is, genetically darker, not tanned):
  - they may need more time in sunlight to produce the same amount of vitamin D as people with lighter skin
  - they can be exposed for longer before risking sunburn and skin cancer, but should not get to the point where their skin is likely to go red or burn
  - if they are very dark, damage may be indicated by their skin getting hot in the sun and then staying hot afterwards, rather than signs of redness.
- Tell people with naturally lighter skin that they do not need much time in sunlight to produce vitamin D (always less than the time to risk the skin going red or burning). Also tell them they are at greater risk of sunburn and skin cancer – including after shorter periods of exposure – than people with darker skins.

Help for groups in specific settings

Recommendation 10 Develop policies for infants, children and young people on how to benefit from sunlight exposure

Managers and staff in early years settings, education (including preschool settings, primary and secondary schools) and leisure environments should:

- Develop, implement and monitor a policy to raise awareness of the health benefits and risks of sunlight exposure among children and young people (see recommendation 2).

- Develop and agree a policy on the use and application of sunscreen to children. Tell parents about the policy. This should:
  - specify who applies it, and when, to children when they are on the premises
  - include guidelines on how to help children apply sunscreen (and how children can help each other apply it).

Recommendation 11 Promote awareness of the benefits and risks of sunlight exposure among infants, children, young people, their parents and carers

Managers and staff in early years settings, education (including preschool settings, primary and secondary schools) and leisure environments should:

- Consider using practical, classroom-based activities (for example, in personal, social, health and economic lessons covering health or diversity) to increase children and young people's knowledge of:
  - the health benefits and risks of sunlight exposure (see recommendations 6–7) and how this varies according to individual characteristics (see recommendations 8–9)
  - the importance of knowing how their own skin reacts (based on past experience).
- Provide children, young people, their parents and carers with timely (for example, during the spring and summer holiday season) information on the benefits and risks of sunlight exposure in play and leisure environments. This should be consistent with recommendations 6–9. For detail on how the information should be displayed see recommendation 2.
- Encourage children and young people to spend time in the shade and to wear wide-brimmed hats, protective clothing and sunscreen to protect themselves when UV levels are high (above 3 on the UV index)
- Encourage parents of children at higher risk of skin cancer to provide their child with protective clothing as well as sunscreen (see recommendations 6 and 7).

Recommendation 12 Develop policies and activities to protect workers

Employers, managers and practitioners in the public, private, voluntary and community sectors should:

- Determine whether employees face a risk either from over- or under-exposure to sunlight during working hours.
- If there is a risk, develop, implement and monitor a policy to make people aware of the benefits and risks (see recommendation 2).
- Recognise that implementing a policy on sunlight exposure will help employers of outdoor workers to meet their responsibilities under the Health and Safety at Work Act. (Sunlight exposure is an occupational hazard for people working outdoors.)
- Ensure that information on sunlight exposure is incorporated into routine health and safety training. Messages should be consistent with those outlined in recommendations 6–9.

Recommendation 13 Develop policies and activities for everyone living in residential care or using day care services

Managers and practitioners who work in residential or day care settings should:

- Develop, implement and monitor a policy to promote the benefits and risks of sunlight exposure (see recommendation 2).
- Provide adults, children and their carers with information on the benefits and risks of sunlight exposure. This information should be consistent with recommendations 6–9. (For detail on how the information should be displayed see recommendation 2.)

Training

Recommendation 14 Use training to raise awareness among health, social care and other practitioners about the benefits and risks of sunlight exposure

Health Education England, Public Health England, clinical commissioning groups and local authorities should:

- Ensure health, public health and social care practitioners, as part of their registration and post-registration training and continuing professional development, receive detailed information on the health benefits and risks of sunlight exposure (see the Background section). This includes the importance of conveying a consistent message to the public (see recommendations 6–9).

2 Who should take action?

Introduction

The guideline is for commissioners, managers and practitioners with public health or social care as part of their remit working in the NHS, local authorities and the wider public, private, voluntary and community sectors. It is also aimed at:

- people working in and managing early years settings, educational settings (including preschool, primary and secondary schools) and leisure environments
- employers (including public sector organisations)
- managers and practitioners working in residential or day care settings
- others with a duty of care for other people.

In addition, it will be of interest to groups at increased risk of low vitamin D status or skin cancer, their families and carers and other members of the public.

Who should do what at a glance

Who should take action	Recommendation
Public Health England	1, 14
Organisations that coordinate or offer training, or register and set standards for professionals	14
NHS, local authorities and strategic partnerships (including health and wellbeing boards)	1, 14
Local safeguarding children boards and other local partnerships, organisations and staff with a responsibility for safeguarding children	2, 10, 11, 14
Commissioners	3, 5,14
Heads and managers of health and social care services	2, 13
Health and social care staff	2, 4, 6, 7, 8, 9, 12
Managers and staff in early years settings, education (including preschool settings, primary and secondary schools)	2, 10, 11, 12
Employers (including public sector)	2, 12
Managers and practitioners who work in residential or day care settings	2, 13

3 Implementation: getting started

NICE has worked with the Public Health Advisory Committee to identify areas in this draft guideline that may have a big impact on practice or could be difficult to implement.

A key message is that health and social care practitioners should discuss the risks and benefits of sunlight exposure as a matter of routine when they meet members of the public. (Related to recommendation 4.)

If the draft recommendations are not changed after consultation we think there will be cross-cutting challenges in 3 important areas of the guideline:

- Delivering consistent, simple tailored messages that take into account equality issues (related to all recommendations).
- Delivering messages to children and young people (related to recommendation 11).
- Commissioning mass media campaigns (related to recommendation 5).

During consultation we want stakeholders to let us know if you agree. Or do you think other areas in this guideline will have a bigger impact – or be more difficult to implement?

We would also like you to send us your suggestions on how these challenges could be met. For example, you could share examples of good practice. Or you could give us details of educational materials or other relevant resources that you have found useful. This information will be used to write an implementation section for the final guideline.

Please use the stakeholder comments form to send us your comments and suggestions.

Challenges for implementation

The Context section has more details on current practice.

Delivering consistent, tailored messages

Correcting misconceptions and delivering consistent, tailored and simple messages is a significant change in practice.

Public health and other practitioners will need to develop their knowledge and understanding of the benefits and risks of UV exposure. They will also need to develop skills to interpret and convey these risks and benefits to different groups and individuals, depending on a range of biological and behavioural factors.

Commissioners may need persuading to invest in the education and training needed. In addition, service protocols in a number of settings may need to be reviewed to ensure these messages are consistently conveyed as a matter of routine. This will need strong local leadership because it involves bringing different professional groups together. (Related to recommendations 1–3 and 14.)

Delivering messages to children and young people

It is particularly important to reach children and young people. For example, schools will need to develop a policy to promote the benefits and risks of exposure to the sun. (Related to recommendation 10.)

Commissioning mass media campaigns

Public health commissioners may need persuading to integrate consistent messages on sunlight exposure into existing local mass media campaigns. In light of competing public health priorities and current financial restraints, this will be a challenge. (Related to recommendation 5.)

4 Context

Introduction

Sunlight exposure has a number of health benefits and risks (see Background in the main introduction to this guideline).

Many people are not exposed to enough sunlight because of cultural practices, an indoor lifestyle (Solar ultraviolet radiation: Global burden of disease from solar ultraviolet radiation World Health Organization) or rigorous skin protection methods (Misra et al. 2008).

In addition, from mid-October to the beginning of April in the UK, sunlight contains very little of the ultraviolet B (UVB) wavelength the skin needs to make vitamin D. People rely on body stores from sunlight exposure in the summer and dietary sources to maintain vitamin D levels (SACN update on vitamin D – 2007 The Scientific Advisory Committee on Nutrition).

People at risk of overexposure include outdoor workers and anyone else who generally spends a long time outdoors, for example, because of outdoor leisure pursuits such as sailing or gardening or because they like to sunbathe.

Studies have shown that most people are aware of the risks of overexposure to the sun but need to be frequently reminded to protect themselves (The NHS Cancer Plan: three years progress report – maintaining the momentum Department of Health).

Generally, a significant disparity exists between knowledge and behaviour (Hiom 2006). This may reflect the positive effects of the sun on psychological wellbeing, the fact that many people like to have a sun tan, and the time lag between exposure and the development of skin cancer.

Complex health messages

An optimal level of sun exposure would maximise the health benefits, minimise the risks and allow people to enjoy the sun without burning. But communicating the risks and benefits can be difficult for health and social care practitioners.

Research on the role of sunlight in preventing low vitamin D status[3] can conflict with sun protection messages, unless carefully interpreted (see review 2 Synthesis of effectiveness and cost effectiveness evidence from NICE's guideline on skin cancer prevention).

Current messages do not make it easy for people to understand the specific risks they face, resulting in common misconceptions about how to benefit and how to reduce the risks from sunlight. These include, for example the idea that:

- 'applying sun cream is sufficient protection'
- 'it is impossible to burn on a cold day'.

There is also a general belief that skin cancers can easily be treated. This is often, but not always, the case (see skin cancer section below). These misconceptions exist, despite the efforts of a wide range of organisations.

Vitamin D deficiency

The National Diet and Nutrition Survey found that many adults in Britain aged 19 to 64 were reported to have a low vitamin D status (17% of men and 19% of women). It also found that 19% of boys and 20% of girls aged 11 to

[3] In the UK, 25 nmol/litre of serum 25-hydroxyvitamin D concentration is currently used as the lower threshold for vitamin D adequacy. Below this level there is an increased risk of rickets and osteomalacia and people are considered to have vitamin D deficiency. However, the Scientific Advisory Committee on Nutrition is currently reviewing this threshold.

18 years were considered to have a low vitamin D status (National diet and nutrition survey: headline results from years 1,2 and 3 (combined) of the rolling programme, 2008/09–2010/11 Department of Health and Food Standards Agency).

There have also been reports that rickets, caused by lack of vitamin D, is re-emerging among children in the UK (Pearce and Cheetham 2010). Low vitamin D status may also be associated with other diseases and long-term conditions such as osteoporosis, diabetes and some cancers ('SACN update on vitamin D – 2007').

Skin cancer

Excessive exposure to UV rays is the main cause of skin cancers and is one of the most avoidable causes of cancer risk and death in the UK.

Skin cancer incidence rates (melanoma and non-melanoma skin cancer) have increased rapidly in England in the past 30 years partly, perhaps, because of increased travel to sunnier countries (Hiom 2006). In 2011, 13,348 cases of melanoma and 102,628 cases of non-melanoma skin cancer were diagnosed in the UK. In 2012 there were 2148 deaths from melanoma and 638 deaths from non-melanoma skin cancers (Skin cancer statistics Cancer Research UK).

Melanoma is the second most common cancer in those aged 15 to 34. But the risk of skin cancer increases with age and people aged 65 and older are most likely to be diagnosed with late-stage melanoma.

In 2008/9, it cost the NHS in England an estimated £105.2 million to treat skin cancer (Measuring current and future cost of skin cancer in England Vallejo-Torres et al. 2013). This is predicted to rise to more than £180 million in 2020 ('Measuring current and future cost of skin cancer in England').

Primary care spending on treatments for low vitamin D status rose from £28 million in 2004 to £76 million in 2011 (Treating vitamin D deficiency to cost £100m a year by 2013 GP online, 13 February 2012; Prescription cost analysis England 2011 Health and Social Care Information Centre).

5 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.)

Background

5.1 The contribution sunlight makes to vitamin D status (and how high protection sun screen may block it out) was beyond the remit of this guideline. Committee members were aware that the Scientific Advisory Committee on Nutrition (SACN) vitamin D working group is considering this and, wherever possible, this guideline is consistent with SACN's advice. SACN's findings will be taken into account in the final version of this guideline or in an update, depending on when it is published. The Committee noted that NICE has also published a guideline on how to increase vitamin D supplement use. It is hoped that these 3 pieces of work will provide the basis for clear, consistent advice to reduce the risk of low vitamin D status among all at-risk groups.

5.2 The Committee acknowledged that the people at risk of overexposure to sunlight and those at risk of not having enough vitamin D are usually in different groups, so messages can be adapted accordingly. But members also noted that care would be needed when communicating the benefits and risks to the general population, because inconsistent public messages would be a barrier to behaviour change. The Committee aligned messages in this guideline with national advice from NHS Choices and the vitamin D consensus statement to achieve some consistency.

5.3 It is not possible to provide a simple definitive message on the optimal frequency and duration of sun exposure for different groups for the best ratio of benefits to risks. The only consistent message is that the risks can be reduced if people never expose their skin

long enough for it to redden or burn. One reason why it is difficult to provide a simple message is that the amount of UV someone gets from sunlight depends on a range of biological, environmental and behavioural factors.

5.4 The Committee was aware that the cultural context in which people receive benefit and risk messages may influence behaviour change. Report 1 Communicating the benefits and risks of ultraviolet light to the general population: a qualitative documentary analysis of UK newspapers and magazines (print and online) highlighted a generally positive portrayal of sun tanning in the media. For example, images of sunbathing are usually accompanied by references to a 'healthy tan' and the value of 'escaping to the sun'.

5.5 Committee members agreed that, although complex, advice on preventing both skin cancer and low vitamin D status can be combined. They heard that short (less than the time it takes for skin to redden or burn), frequent periods of sunlight exposure are best for vitamin D synthesis. In addition, this type of exposure is less likely to result in skin cancer.

5.6 The Committee noted that once the body has synthesised vitamin D, more time in the sun is harmful and can also break surplus vitamin D down.

5.7 There is much debate and uncertainty about whether the potential benefits of sunlight exposure may outweigh the risk of skin cancer. The Committee was aware that the Advisory Group on Non-ionising Radiation's review of the health effects of UV radiation on vitamin D synthesis is currently being updated. Members felt that it would be important to refer to the Advisory Group's latest findings when they are published.

5.8 The Committee questioned the usefulness of referring to 'skin types' (I–VI) to help people assess how to benefit more from, and

reduce their level of risk from, sunlight exposure. It noted that both practitioners and the public find it difficult to judge skin types. They opted instead to refer to lighter and darker skin types.

5.9 The balance of published evidence supports the idea that skin with darker pigmentation needs longer sunlight exposure than lighter skin to produce equivalent levels of vitamin D. But some emerging data indicates this may not always be the case. Further research is needed. In the meantime, the Committee was clear that people of all skin types should not risk burning their skin.

5.10 The Committee debated how much information should be included in messages for the general population. Members were aware that it would be impractical for health practitioners to deliver very detailed messages as the opportunity arises, without it being at the expense of giving other advice or treatment. So the Committee decided to recommend keeping messages short and simple.

5.11 The limitation of using sunscreen alone to protect from sunlight exposure was noted. Members were also aware that some people use sunscreen because they want a tan and believe that its use means they can stay in the sun for longer without burning. In addition, sunscreen is often not applied evenly so people mistakenly believe their skin is protected when, in fact, patches are not and they risk burning.

5.12 The Committee was aware of concerns that sunscreen prohibits vitamin D synthesis. Expert testimony clarified that this may be the case when sunscreen is tested in laboratory conditions. But it is unlikely to be the case in reality, because people tend to apply much less sunscreen than the manufacturers recommend and in a patchy fashion.

Behaviour change

5.13 The Committee was aware that cultural context may influence whether or not people respond to public health messages. Information is usually a necessary precursor to behaviour change, but information alone is not always enough. Members agreed that the best outcome from information provision is a change in behaviour. But they also felt there was some value in using information to alter attitudes, for example towards tanning, because this may eventually lead to behaviour change.

5.14 The degree to which people believe they can change their level of risk plays a role in the decision-making process. The time-lag between sun exposure and skin cancer – and the perceived short-term benefits (such as tanning and relaxation) – also play a part. Members agreed that there is a need to help people accurately determine how they can achieve vitamin D synthesis while not damaging their skin.

5.15 The Committee recognised the importance of persuading children of the benefits and risks of sunlight. This is partly because of the higher risks they face from both low vitamin D status (for example, the development of rickets) and skin cancer (often associated with sunburn in childhood). In addition, the Committee noted the importance of helping children establish life-long health-promoting behaviours.

Evidence

5.16 The evidence on communicating complex messages was very limited. The Committee recognised that there is no single message about how to reduce the risks and promote the benefits of sunlight exposure because it depends on so many different factors. Following expert testimony on risk communication, the Committee also noted the need for messages to be consistent and simple.

(The success of the ‘5-a-day’ fruit and vegetable message was noted.)

5.17 The Committee noted that there was limited and inconsistent evidence from the review of cost-effectiveness. The review of effectiveness identified a number of interventions that have changed behaviours in the sun, or reduced the incidence of sunburn. But none of the studies focused on delivering a complex message that conveyed both the risks and benefits. The Committee also noted that the interventions in the review tended to have small sample sizes, small effect sizes and measured only short term outcomes.

5.18 The Committee heard that it was not possible to include the health conditions associated with low vitamin D status in the economic model because of insufficient effectiveness evidence. So the model focused on the risks of exposure to sunlight.

5.19 The majority of studies identified in the evidence reviews were based in countries with a very different climate from the UK (for example, Australia and the US). The Committee felt that it would be difficult, for example, to transfer evidence from Australia to the UK context because Australian campaigns have been in place for longer and are better funded than in the UK. The Committee also noted that if there were any studies on people at risk of low vitamin D status, there would be a need to consider whether the study took place in a country that fortifies food with vitamin D. (Because this would result in the population having higher baseline levels of vitamin D).

5.20 There is growing interest in the use of new technology, including phone and tablet apps, to deliver behaviour change interventions. But the Committee noted a lack of formal evaluations of effectiveness. In addition, although at the moment there is no evidence to show text messages are cost effective, members were

aware that this may change. (They suggested that any such change could be captured in an update of this guideline.)

5.21 Photo-ageing interventions were not cost effective so they were not recommended for NHS settings. But the Committee acknowledged that they are perhaps likely to be delivered in private clinics and health and beauty businesses.

Health inequalities

5.22 The Committee noted that universal interventions could result in adverse effects for some groups and so increase health inequalities. For example, universal messages about protecting the skin from sunlight exposure may inadvertently lead to a reduction in the amount of skin exposed to sunlight among groups at risk of low vitamin D status. Members were aware of the need for practitioners to tailor messages for individuals to combat this problem.

5.23 The Committee recognised that the cost of sunscreen could be prohibitive for some people. It felt this might prevent people either using it or applying sufficient quantities to protect their skin adequately.

Health economics

5.24 The economic evidence review did not identify any studies applicable to the UK so a bespoke economic model was developed, based on the effectiveness evidence. The interventions included: an information programme for schoolchildren; photo-ageing; tailored messaging; text messages; and a mass media campaign. The comparator used was ‘no intervention’ because it was not possible to establish current practice. The outcome measures modelled were: sunburn, basal cell carcinoma, squamous cell carcinoma and malignant melanoma. The incremental cost-effectiveness ratio (ICER) of the information programme for schoolchildren, photo-ageing and text messages were: £312,744, £316,968 and £65,945 per quality-adjusted life-

year (QALY) gained, respectively. Tailored messages had an estimated ICER of £14,249 per QALY gained. The mass media campaign was dominant; that is, it was less costly and more effective than no intervention because it avoided future expenditure on treatment and the cost saving outweighs the cost of intervention. The Committee noted that the uncertainties were explored in sensitivity analyses.

5.25 The Committee noted that it was not possible to model the benefits of vitamin D because of a lack of evidence on the effectiveness of complex messages about the benefits of sunlight exposure.

5.26 The Committee heard evidence about how sunlight exposure can affect eye health specifically, how it can result in cataracts. But members acknowledged that the effects could not be modelled because of a lack of suitable data.

5.27 The Committee discussed differences between the economic model for this guideline and the one used for NICE's guideline on skin cancer prevention. The model for this guideline used the effectiveness evidence to calculate the relative risks of sunburn. In addition, it used epidemiological evidence to link the use of any kind of protection with the incidence of sunburn. This was important because several interventions showed significant reductions in the incidence of sunburn and these reductions were captured in the economic model.

5.28 The Committee acknowledged the challenges of linking behavioural changes to health outcomes in the economic model, in the absence of relevant evidence. Members discussed uncertainties about the duration of effects and how often an intervention needed to be repeated to maintain the size of effect. The Committee discussed whether assumptions used in the economic model to link study outcomes with health outcomes and healthier behaviours were reasonable, given the lack of evidence. In addition, members noted

the associated uncertainties were sufficiently explored in the sensitivity analyses.

5.29 The Committee noted that to be cost effective (assuming a threshold of £20,000 per QALY), a tailored messages intervention should cost a maximum of £5.89 per person. A mass media campaign should cost no more than £2.15 per person. Members also noted, however, for each type of intervention, the information for the economic evaluation was drawn from single studies. Generally, interventions must be cheap to be cost effective, for example, messages delivered as part of practitioners' routine practice could be cost effective.

This section will be completed in the final document.

6 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.

6.1 What factors influence the effectiveness of social and digital media methods used to convey complex risk messages and influence behaviours in relation to under- and overexposure to sunlight? How does this vary at individual, group and population level in the UK? How does this vary for black and minority ethnic groups in the UK?

6.2 What factors influence the effectiveness of methods used to convey complex risk messages and influence behaviours in relation to under- and overexposure to sunlight? (This excludes methods

involving social and digital media.) For example, how does effectiveness vary according to communicator, message, audience and medium? How does this vary at individual, group and population level in the UK? How does this vary for black and minority ethnic groups in the UK?

6.3 What are the most effective methods of identifying and targeting individuals and groups at risk of either under- or overexposure to sunlight?

6.4 What combinations of interventions are most effective at helping people to benefit from, and reduce their risks of, exposure to sunlight? How much does this vary according to the type of intervention for example, the communicator, message, audience and medium?

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

7 Related NICE guidance

Published

- Vitamin D: increasing supplement use among at-risk groups (2014) NICE guideline PH56
- Behaviour change: individual approaches (2014) NICE guideline PH49
- Ambulight photodynamic therapy for the treatment of non-melanoma skin cancer (2011) NICE medical technology guidance 6
- Skin cancer prevention: information, resources and environmental changes (2011) NICE guideline PH32
- Metastatic malignant disease of unknown primary origin (2010) NICE guideline CG104
- Skin tumours including melanoma (2010) NICE cancer service guidance
- Promoting physical activity for children and young people (2009) NICE guideline PH17
- Maternal and child nutrition (2008) NICE guideline PH11

- Community engagement (2008) NICE guideline PH9
- Physical activity and the environment (2008) NICE guideline PH8
- Behaviour change: the principles for effective interventions (2007) NICE guideline PH6
- Referral guidelines for suspected cancer (2005) NICE guideline CG27

Under development

- Healthy Start vitamins: is a targeted or a universal approach more cost effective? NICE special report. Publication expected June 2015.
- Prisons: physical health of people in prisons. NICE guideline. Publication expected November 2016.

8 Glossary

Culturally appropriate

Culturally appropriate interventions take account of cultural or religious beliefs and language and literacy skills by:

- using community resources to improve awareness of, and increase the number of people who can get interventions
- understanding the target community and the messages that resonate with them
- identifying and addressing barriers to access and participation
- developing communication strategies that are sensitive to language and information needs
- taking account of cultural or religious practices
- considering how closely aligned people are with their ethnic group or religion.

Low vitamin D status

Low vitamin D status (sometimes called vitamin D deficiency) is defined by the Department of Health as a plasma concentration of 25 hydroxyvitamin D (the main circulating form of the vitamin) of below 25 nmol/litre (equal to 10 ng/ml).

Mass media

Mass-media interventions use a range of methods to communicate a message. This can include local, regional or national television, radio and newspapers, and leaflets and booklets. It can also include new media (that is, the Internet or mobile phones). Internet communication can include real-time streaming of information and podcasts, discussions with experts and use of social networking sites.

Photo-ageing

Photo-ageing results from chronic exposure to UV radiation. It may include any or all of the following: dryness, itching, wrinkling, irregular pigmentation, sallowness, irregular blood vessel dilatation, enlarged blackheads, fragility with easy bruising and loss of skin elasticity.

Residential or day care settings

Examples of residential and day care settings include:

- day care centres for older people and adults or children with physical or learning disabilities
- children's homes
- residential and nursing care homes (including those for adults and children with physical or learning disabilities)
- prisons
- young offender institutes.

Vitamin D

Vitamin D is obtained through the action of sunlight on skin and from dietary sources. The action of sunlight (ultraviolet [UV] radiation with a wavelength of about 290–310 nanometres) on skin converts 7-dehydrocholesterol to previtamin D3, which is then metabolised to vitamin D3.

9 References

Hiom S (2006) Public awareness regarding UV risks and vitamin D – the challenges for UK skin cancer prevention campaigns. Progress in Biophysics and Molecular Biology 92: 161–6

Misra M, Pacaud D, Petryk A et al. (2008) Vitamin D deficiency in children and its management: review of current knowledge and recommendations. Pediatrics 122: 3984

Pearce SHS, Cheetham TD (2010) Diagnosis and management of vitamin D deficiency. British Medical Journal 340: 142–7

Shea BJ, Grimshaw JM, Wells GA et al. (2007) Development of AMSTAR: a measurement tool to assess the methodological quality of systematic reviews. BMC Medical Research Methodology 7: 10

10 Summary of the methods used to develop this guideline

Introduction

The reviews, commissioned report 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

8. Final guideline published on website

9. 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: What are the most effective and cost-effective ways of presenting and disseminating complex health risk information to help people assess their own level of health benefits and risks from sun exposure (or that of others for whom they have a duty of care)?

Question 2: What are the most effective and cost-effective ways to change people's beliefs about the risk of sun exposure and to encourage them to change their sun protection practices accordingly? How does this differ for subpopulations, including:

- people with different levels of education
- people with learning disabilities
- people with physical impairments (for example, sight issues if relying on visual representation of risk)

- people who are non-English speaking or whose first language is not English
- people from different religious and cultural backgrounds
- people of different ages?

Question 3: How have the health benefits and risks of sun exposure been conveyed in the media?

The subsidiary questions were:

1. What type of evidence sources are news articles based on? How accurate are these sources – and how in line with the source evidence are the articles?

2. How balanced are news articles in terms of outlining vitamin D benefits and skin cancer risks? Is reference made to the role of individual risk factors?

Question 4: What are the barriers to, and facilitators for, risk communication strategies and interventions in optimising safe sun exposure knowledge and protection practices? How does this vary by subpopulations?

The subsidiary questions were:

1. What are people's knowledge, beliefs, attitudes and perception of the benefits and risks of sun exposure?

2. From what sources do people gain their knowledge regarding safe sun exposure (for example, news media, health professionals, peers)? What is the relationship between the source of knowledge, levels of accurate knowledge and sun exposure and protection practices?

3. How do people make judgments about risk from sun exposure and how does this influence decisions about sun exposure and protection practices?

4. How do people interpret and respond to conflicting messages on sun exposure and health? To what extent are they aware that messages differ according to individual risk factors?

5. What has been the impact of increased knowledge of the benefits of vitamin D on sun exposure practices?

6. How effective have sun safety messages been in achieving safe sun exposure and protection practices? How does this vary by different messages (for example, stay out of the sun at midday, use SPF15) and why?

7. To what extent do people understand the UV Index? How does it affect their sun exposure and protection practices?

Question 5: What content do effective and cost effective primary skin cancer prevention message contain? What is the most effective and cost effective content?

These questions were made more specific for each review.

Reviewing the evidence

Effectiveness reviews

Two reviews of effectiveness were conducted:

- Review 1: Overview of systematic reviews exploring complex risk communication
- Review 2: Communicating the benefits and risks of ultraviolet light to the general population: effectiveness and cost-effectiveness review.

Identifying the evidence

Review 1: several databases were searched for systematic reviews (searches were unrestricted by year of publication). Medline was searched from 2009.

Experts in risk communication and the communication of general health messages were also contacted for any relevant systematic reviews.

Review 2: several databases were searched for primary studies and systematic reviews from January 1994 onwards.

In addition, Google search was used to identify health authority reports that have communicated the risks and benefits of sun exposure. The search was

limited to NHS, local authority, public health observatory and Department of Health sites using the 'site' limit. The webpages of organisations that produce guidance on sun exposure risks and benefits, or undertake research on risk communication, were also searched.

Selection criteria

Studies were included in review 1 if they:

- reported on general communication strategies that aimed to convey messages about risk
- reported on communications specifically related to sun-exposure, alcohol, exercise or diet.

Studies were included in review 2 if they were:

- published in English from 2008 onwards
- primary studies conducted in an Organisation for Economic Co-operation and Development (OECD) country
- systematic reviews.

Studies were excluded from review 2 if they were:

- published in abstract form only
- case reports
- case series
- non-systematic reviews
- editorials or opinion papers.

Other reviews

One review of barriers and facilitators was conducted. See review 3: Communicating the benefits and risks of ultraviolet light to the general population: barriers and facilitators review

Identifying the evidence

Several databases were searched in February 2014 for primary studies and systematic reviews from January 1994 onwards. See review 3.

Selection criteria

Studies were included in review 3 if they were:

- published in English from 2008 onwards
- primary studies undertaken in an OECD country that reported on barriers to, and facilitators for conveying the risks or benefits of safe sun exposure
- systematic reviews.

Studies were excluded if they were:

- published in abstract form only
- case reports
- case series
- non-systematic reviews
- editorials, opinion papers.

Quality appraisal

Included papers 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. Each study was graded (++, +, −) to reflect the risk of potential bias arising from its design and execution.

++ All or most of the checklist criteria have been fulfilled. If 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.

Systematic reviews were assessed for methodological rigour and quality using the AMSTAR quality assessment tool (Shea et al 2007).

The systematic reviews were graded as ‘good quality’ if they met 8 or more of the 11 AMSTAR criteria, ‘moderate quality’ if they met 5 to 7 of the criteria, and ‘poor quality’ if they met 4 or fewer criteria.

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 documentary analysis 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.

Primary research and commissioned reports

One commissioned report was conducted:

- Report 1: Communicating the benefits and risks of ultraviolet light to the general population: a qualitative documentary analysis of UK newspapers and magazines (print and online).

Identifying the evidence

Several UK national newspapers and monthly magazines (print and online versions) and the Nexis UK news and business database were searched for newspaper and magazine articles published between 1 January 2010 and 17 March 2014.

Selection criteria

Articles were included if they were published in a UK national newspaper or monthly magazine and:

- reported on research evidence or a national guideline or consensus statement about the health benefits and risks associated with sunlight exposure between 1 January 2010 and 17 March 2014.

- contained other material related to the health benefits and risks associated with sunlight exposure published during 2013 only.

Articles were excluded if they:

- were not published in a UK national newspaper or monthly magazine.

Cost effectiveness

There was a review of economic evaluations and an economic modelling exercise. See review 2 and economic modelling report 1 'Communicating the benefits and risks of ultraviolet light to the general population: cost effectiveness model technical report'.

Review of economic evaluations

Studies were included in the cost effective section of review 2 if they were:

- cost–utility analyses
- cost-effectiveness analyses
- cost-benefit analyses
- cost-minimisation analyses
- cost-consequences analyses.

The following study types were excluded:

- burden of disease
- cost of illness.

For information on searches and the quality criteria used to assess and score studies see review 2.

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 economic

modelling report 1 Communicating the benefits and risks of ultraviolet light to the general population: cost effectiveness model technical report.

How the PHAC formulated the recommendations

At its meetings in June, July, September and October 2014 the Public Health Advisory Committee (PHAC) considered the evidence and cost effectiveness to determine:

- whether there was sufficient evidence (in terms of strength and applicability) to form a judgement
- if relevant, whether (on balance) the evidence demonstrates that the intervention, programme or activity can be effective or is inconclusive
- if 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.

If evidence was lacking, the PHAC also considered whether a recommendation should only be implemented as part of a research programme.

If possible, recommendations were linked to evidence statements (see The evidence for details). If a recommendation was inferred from the evidence, this was indicated by the reference 'IDE' (inference derived from the evidence).

11 The evidence

Introduction

The evidence statements from 3 reviews are provided by external contractors.

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 1.1 indicates that the linked statement is numbered 1 in review 1. **Evidence statement number 2.1.3** indicates that the linked statement is numbered 1.3 in review 2. **ER1** indicates that expert report 1 is linked to a recommendation. **EP1** indicates that expert paper 1 is linked to a recommendation.

If 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).

If the Public Health Advisory Committee (PHAC) has considered other evidence, it is linked to the appropriate recommendation below. It is also listed in the additional evidence section below.

Recommendation 1: IDE

Recommendation 2: evidence statements 2.1.3, 3.10, 3.16, 3.27; IDE

Recommendation 3: IDE

Recommendation 4: evidence statements 2.1.3, 3.6, 3.20; IDE

Recommendation 5: evidence statements 2.1.3, 3.6, 3.7, 3.8, 3.9, 3.10, 3.14, 3.16, 3.22, 3.23, 3.27; EP1, IDE

Recommendation 6: EP2, EP3, EP4, EP5; IDE

Recommendation 7: EP4, EP5

Recommendation 8: EP4, EP 5; IDE

Recommendation 9: EP4, EP5; IDE

Recommendation10: evidence statements 3.12, 3.18, 3.19, 3.21, 3.28, 3.29

Recommendation 11: evidence statements 2.1.1, 2.9.1, 3.19, 3.29

Recommendation 12: evidence statements 2.8.10, 3.2, 3.22

Recommendation 13: IDE

Recommendation 14: IDE

Expert report

Report 1

Expert papers

Expert papers 1–6

Economic modelling

Overall, tailored messages and mass media campaigns were cost effective. Information programmes for schoolchildren, photo-ageing and text messaging interventions were not cost effective.

Cost-effective estimates for the different interventions were wide ranging. The incremental cost-effectiveness ratio (ICER) of tailored messages was £14,249 per quality of life year gained (QALY).

The mass media campaign is less costly and more effective. The ICERs of information programmes for schoolchildren, photo-ageing and tailored interventions ranged from £65,945 to £316,968 per QALY gained.

All input values used in the model were subject to a degree of uncertainty. Uncertainties associated with the assumptions made were explored in a range of deterministic sensitivity analyses. The one-way sensitivity analysis revealed that the key drivers of cost-effectiveness were the cost of implementing the intervention and its effectiveness.

The specific scenarios considered and the full results can be found in Economic modelling report 1.

12 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 and expert comment. These gaps are set out below.

1. There is a lack of good quality evidence on the effectiveness of different approaches to communicating, disseminating and presenting risk information.

(Source: Review 1)

2. There is a lack of good quality evidence on the effectiveness of risk communication among different subpopulations.

(Source: Review 1)

3. There is a lack of evidence on how health and social care practitioners and policy makers should convey messages about the benefits and risks of sun exposure, particularly in the UK.

(Source: Review 2)

4. There is a lack of evidence on how messages about the benefits and risks of sun exposure can be effectively tailored for different groups. In particular, there is a lack of evidence on tailoring messages for: people who are non-English speaking or whose first language is not English, people from different religious or cultural backgrounds, and people with dark skin, or people who have low or no exposure to the sun.

(Source: Reviews 2 and 3)

5. There is a lack of epidemiological evidence linking sun exposure to the incidence of cataracts.

(Source: Economic modelling report 1)

6. There is a lack of evidence on interventions aimed at increasing sun-exposure among groups at risk of low vitamin D status.

(Source: Review 3)

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

Public Health Advisory Committee F

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 the NHS, education, social care, environmental health, local government or the voluntary sector. The following are members of PHAC F:

Chair

Catherine Law

Professor of Public Health and Epidemiology, UCL Institute of Child Health

Core members

Melvyn Hillsdon

Associate Professor of Exercise and Health Behaviour, University of Exeter

Stuart Lines

Tri-borough Consultant in Public Health and Deputy Director of Public Health, London Borough of Hammersmith & Fulham

John Macleod

Professor of Clinical Epidemiology and Primary Care, University of Bristol

David McDaid

Senior Research Fellow in Health Economics and Health Policy, London School of Economics and Political Science

Ann Nevinson

Community Member

Topic members

Janis Baird

Associate Professor of Public Health Medicine, MRC Lifecourse Epidemiology Unit, University of Southampton

John Hawk

Emeritus Professor of Dermatological Photobiology, St John's Institute of Dermatology, King's College London; Honorary Consultant Dermatologist, St John's Institute of Dermatology, Guys and St Thomas' NHS Trust, London.

Eugene Healy

Professor of Dermatology, University of Southampton

Gary Lipman

Chairman, The Sunbed Association

Shelley Mason

Community Member

Lesley Rhodes

Professor of Experimental Dermatology, University of Manchester; Consultant Dermatologist, Salford Royal NHS Foundation Hospital

Expert co-optees to PHAC

Rashmi Shukla

Regional Director for the Midlands and East of England, Public Health England

Stephen Sutton

Professor of Behavioural Science, University of Cambridge

Expert testimony to PHAC

John Hawk

Emeritus Professor of Dermatological Photobiology, St John's Institute of Dermatology, King's College London; Honorary Consultant Dermatologist, St John's Institute of Dermatology, Guys and St Thomas' NHS Trust, London.

John Marshall

Professor of Ophthalmology, UCL Institute of Ophthalmology in association with Moorfield's Eye Hospital

Miriam McCarthy

Consultant in Public Health Medicine, Public Health Agency, Northern Ireland

John O'Hagan

Group Leader, Laser and Optical Radiation Dosimetry Group, Public Health England

Lesley Rhodes

Professor of Experimental Dermatology, University of Manchester; Consultant Dermatologist, Salford Royal NHS Foundation Hospital

Stephen Sutton

Professor of Behavioural Science, University of Cambridge

NICE project team

Mike Kelly

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Emma Doohan

Project Manager

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Coordinator

Sue Jelley

Senior Editor

Susan Burlace

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 communicating the benefits and risks of sunlight exposure to the general public (see the scope).

This guideline is a partial update of Skin cancer prevention: information, resources and environmental changes NICE guideline PH32 (2011). The recommendations in the final guideline will replace recommendations 1 to 5 in 'Skin cancer prevention: information, resources and environmental changes'.

The recommendations in this guideline focus on the effect of ultraviolet rays on people's health and wellbeing, as opposed to visible sunlight. It does not provide detail on vitamin D supplementation, or cover treatments for skin cancer. (See Related NICE guidance for other recommendations that may be relevant to sunlight exposure.)

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.

Other guidance and policies

The guideline should be implemented alongside other guidance and regulations:

- Equity and excellence: liberating the NHS (Department of Health)
- Healthy lives, healthy people: our strategy for public health in England (Department of Health)
- Improving outcomes: a strategy for cancer (Department of Health)
- Public health outcomes framework for England 2013–2016 (Department of Health)
- Update on vitamin D (Scientific Advisory Committee on Nutrition).

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 review/s:
  - Review 1: 'Overview of systematic reviews exploring complex risk communication' was carried out by York Health Economics Consortium. The principal authors were: Maria Cikalo, Anita Fitzgerald, Sam Brown, Mary Edwards and Julie Glanville.
  - Review 2: 'Communicating the benefits and risks of ultraviolet light to the general population: effectiveness and cost-effectiveness review' was carried out by York Health Economics Consortium. The principal authors were: Anita Fitzgerald, Maria Cikalo, Anne Lethaby, James Mahon, Robert Hodgson, Sam Brown, Jacoby Patterson, Ashwini Sreekanta, Victoria Burley, Hannah Wood, Mary Edwards and Julie Glanville.
  - Review 3: 'Communicating the benefits and risks of ultraviolet light to the general population: barriers and facilitators review' was carried out by York Health Economics Consortium. The principle authors were: Anita Fitzgerald, Anne Morgan, Maria Cikalo, Anne Lethaby, Sam Brown, Jacoby Patterson, Ashwini Sreekanta, Victoria Burley, Hannah Wood, Mary Edwards and Julie Glanville.
- Review of economic evaluations: see review 2 above.
- Economic modelling report 1 'Communicating the benefits and risks of ultraviolet light to the general population: cost effectiveness model technical report' was carried out by York Health Economics Consortium. The

principal authors were: Robert Hodgson, Isobel Carpenter, Michelle Jenks, Sarah Dickinson and Matthew Taylor.

- Primary research and commissioned reports:
  - Report 1 'Communicating the benefits and risks of ultraviolet light to the general population: a qualitative documentary analysis of UK newspapers and magazines (print and online)' was carried out by York Health Economics Consortium. The principal authors were: Nicola Moran, Bryony Beresford, Hannah Wood and Julie Glanville.
- Expert papers
  - 1 'Key topics in risk communication' by Stephen Sutton
  - 2 'The Independent Advisory Group on Non-ionising Radiation (AGNIR)' by John O'Hagan
  - 3 'Ultraviolet radiation and the eye' by John Marshall
  - 4 'Achieving adequate sun protection with adequate vitamin D status' by John Hawks
  - 5 'Sunlight and vitamin D' by Lesley Rhodes
  - 6 'Northern Ireland Skin Cancer Prevention Strategy and Action Plan 2011–2021' by Miriam McCarthy.

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: 10 February 2015.
- Next PHAC meeting: 17 March 2015.

The guideline will replace recommendations 1 to 5 in the NICE guideline on skin cancer prevention. (For further details, see Related NICE guidance).

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 2013–16.

- 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.