NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Public health guidance

Scope

This scope was amended in November 2014 to clarify that artificial UV light is outside the remit of this guideline.

1 Guidance title

Sunlight exposure: communicating the benefits and risks of ultraviolet light to the general public

1.1 Short title

Sunlight exposure: benefits and risks

2 Background

a) The National Institute for Health and Care Excellence (NICE) was asked by the Department of Health (DH) to develop public health guidance about communicating the benefits and risks of sunlight exposure to the general public.

b) Following consultation, it was decided to include a partial update of Skin cancer prevention: information, resources and environmental changes, NICE public health guidance 32.

c) Following consultation, it was decided to focus on the effect of the sun's ultraviolet rays on people's health and wellbeing, as opposed to visible sunlight. Note that artificial ultraviolet light exposure is beyond the remit of this guidance.

d) This guidance will support a number of related policy documents including:

- Equity and excellence: liberating the NHS (DH 2010a)

- Healthy lives, healthy people: our strategy for public health in England (DH 2010b)
- Improving outcomes: a strategy for cancer (DH 2011)
- Public health outcomes framework for England 2013–2016 (DH 2012)
- 'Update on vitamin D' (Scientific Advisory Committee on Nutrition 2007)[1]

e) This guidance will provide recommendations for good practice, based on the best available evidence of effectiveness, including cost effectiveness. It is aimed at professionals, commissioners and managers with public health as part of their remit working within the NHS, local authorities and the wider public, private, voluntary and community sectors. It is also aimed at those who report on health issues in the media. In addition, it may be of interest to groups at increased risk of vitamin D deficiency or skin cancer, their families and carers, and other members of the public.

f) The guidance will complement forthcoming NICE guidance on preventing vitamin D deficiency. For further details, see section 6.

This guidance will be developed using the NICE public health guidance process and methods guides.

3 The need for guidance

a) Sunlight is comprised of infrared, visible and ultraviolet (UV) light. The UV radiation that affects people comprises 2 elements: UVA and UVB. Exposure to ultraviolet (UV) light from the sun has a number of health benefits and risks. The main risk from UV exposure is skin cancer. The main benefit (from the UVB element)

[1] The Scientific Advisory Committee on Nutrition (SACN) is currently reviewing the Dietary Reference Values for vitamin D intake. SACN's work will complement this guidance.

is the formation of vitamin D by the skin. Exposure to visible sunlight from the sun also has health risks and benefits but the evidence is less established on this area.

b) Vitamin D is essential for bone health and it is estimated that people make more than 90% of the vitamin D they need from the UVB part of sunlight. However, UV radiation exposure is also directly linked to skin cancer. The risks and benefits of UV exposure from the sun depend on a number of variables, including skin type, geographical location, time of year and day, and weather conditions.

c) The complexity of communicating the benefits of attaining optimal vitamin D levels versus the risk of skin damage from sun exposure makes it difficult to provide a simple, coherent and safe message that influences public opinion effectively (British Association of Dermatologists 2009). Research reported in the media on the role of sunlight in preventing vitamin D deficiency[2] appears to conflict with sun protection messages (Eagle 2009).

d) Studies have shown that most people are aware of the risks of overexposure to the sun (DH 2003). However, a significant disparity exists between knowledge and behaviour (Hiom 2006). Factors that act as a barrier to people protecting themselves include the positive effects of sun exposure on psychological wellbeing and the time lag between exposure and skin cancer development. In addition, there is a belief that skin cancers can be easily treated – and it is fashionable to have tanned skin (British Association of Dermatologists 2009). At the same time, many people may lack adequate exposure to sunlight due to cultural practices, an indoor lifestyle (Lucas et al. 2006) or overzealous skin protection (Misra et al. 2008).

[2] In the UK 25nmol/litre of serum 25-hydroxyvitamin D concentration is currently used as the lower threshold for vitamin D adequacy. Below this there is an increased risk of rickets and osteomalacia, and a person is considered to have vitamin D deficiency. SACN is currently reviewing this threshold.

e) From October to April in the UK there is not enough UVB for vitamin D synthesis from sunlight. People rely on body stores (from sun exposure in the summer) and dietary sources to maintain vitamin D levels (Scientific Advisory Committee on Nutrition 2007). The British National Diet and Nutrition Survey found evidence of vitamin D deficiency in adults aged 19 to 64 (17.1% in men and 18.6% in women). It also found evidence of deficiency among children aged 11 to 18 years (19.43% in boys and 20.4% in girls) (Department of Health and Food Standards Agency 2012). There have been reports that rickets, caused by vitamin D deficiency, is re-emerging among children in the UK (Pearce and Cheetham 2010). Vitamin D deficiency is also associated with other diseases and long-term conditions, such as osteoporosis, diabetes and some cancers (Scientific Advisory Committee on Nutrition 2007).

f) Excessive sun exposure, either cumulative over a lifetime or in intermittent high doses, is the main cause of skin cancers and one of the most avoidable causes of cancer risk and mortality in the UK. Skin cancer rates (malignant melanoma and non-melanoma skin cancer) have increased rapidly in England in the past 30 years, possibly partly because of increased travel to sunnier countries (Hiom 2006). In 2010 12,818 cases of malignant melanoma and 99,549 cases of non-malignant melanoma skin cancer were diagnosed in the UK. There were 2203 deaths from malignant melanoma and 546 deaths from non-melanoma skin cancers (Cancer Research UK 2013). The risk of skin cancer increases with age. Malignant melanoma is the second most common cancer in 15–34 year olds, but people aged 65 and older are most likely to be diagnosed with late stage malignant melanoma.

g) It cost the NHS in England an estimated £105.2 million in 2008/9 to treat skin cancer (Vallejo-Torres et al. 2013). It is estimated that this will rise to more than £180 million in 2020 (Vallejo-Torres et al. 2013). On the other hand, primary care spending on treatments for

vitamin D deficiency rose from £28 million in 2004 to £76 million in 2011 (Robinson 2012; Health and Social Care Information Centre 2012).

4 The guidance

Public health guidance will be developed according to NICE processes and methods. For details see section 5.

This document defines exactly what this guidance will (and will not) examine, and what the guidance developers will consider. The scope is based on a referral from the DH (see appendix A).

4.1 Who is the focus?

4.1.1 Groups that will be covered

a) Everyone, particularly people at increased risk of:

- skin cancer:
  - people with fair skin
  - people with fair or red hair
  - people with more than 50 moles or atypical moles
  - babies and children
  - outdoor workers and people whose lifestyles or leisure pursuits cause excessive UV exposure (such as watersports or gardening)
  - people with a family history of skin cancer.

- vitamin D deficiency:
  - pregnant and breastfeeding women
  - infants and young children (younger than 5 years)
  - people with dark skin, for example, people of African, African–Caribbean, Middle Eastern and South Asian origin
  - older people (65 and older)

- people who have low or no exposure to the sun (for example, people who cover their skin for cultural reasons, and people who are housebound or confined indoors for long periods).

4.1.2 Groups that will not be covered

a) None.

4.2 Activities

4.2.1 Activities/measures that will be covered

a) Activities to increase health practitioners' knowledge, intentions, ability and confidence in giving tailored advice to people about the benefits and risks of sun exposure, what constitutes safe sun exposure, and how often they offer such advice.

b) Activities to increase people's understanding of the health benefits and risks of sun exposure, to help them assess their own level of health risk and benefit (and that of others in their care) and modify their behaviour accordingly.

- This includes the use of different narrative, numeric, verbal and visual data presentation formats (for example, personal stories or testimonials, static versus interactive presentations, tree diagrams, icon arrays, icon plots, infographics, data maps) to communicate complex health risk information.
- These activities may be delivered using one or more of the following approaches (either separately or combined):
  - one-to-one or group-based verbal information (planned or opportunistic)
  - leaflets, posters and other printed information
  - the Internet (including social networking sites), email and text messaging
  - mass-media campaigns.

These interventions could be delivered in various settings (such as the NHS, schools, colleges and workplaces). They could also be delivered by a range of people, including: GPs, practice nurses, midwives, health visitors pharmacists, optometrists and dispensing opticians, those working in early childhood services and teachers.

c) Providing information to prevent the first occurrence of skin cancer, including eyelid malignancies (primary prevention of non-melanoma and malignant melanoma) attributable to UV exposure. This includes: information that improves knowledge and awareness of the causes of skin cancer, the risks of over-exposure to UV, ways to prevent skin cancer, and where to get further information. It also includes information that can help to change behaviour to prevent skin cancer. (This activity relates to the partial update of Skin cancer prevention: information, resources and environmental changes, NICE public health guidance 32.)

Activities/measures being assessed by the Scientific Advisory Committee on Nutrition that will be included in the guidance

a) The biochemical indicators of vitamin D status and the validity of the threshold concentrations. (The latter is a specified quantitative measure used to determine the presence, absence or risk of a health-related condition). In addition, the ranges used to assess risk of deficiency and excess.

b) The association between vitamin D status and various health outcomes at different life stages and in different population groups, and the effects of factors that modify biological responses.

c) The contribution of vitamin D produced through the skin to vitamin D status in the UK. This will take account: factors that modify the effects of skin exposure to sunlight, the risks of skin damage and other adverse health outcomes associated with sunlight exposure.

d) The relative contributions made by dietary vitamin D intake and vitamin D produced through the skin to the vitamin D status of the UK population.

e) The potential adverse effects of high vitamin D intakes.

The Committee will take reasonable steps to identify ineffective measures and approaches.

4.2.2 Activities/measures that will not be covered

a) Managing vitamin D deficiency.

b) Managing skin cancer.

c) Secondary prevention of skin cancer (activities that aim to prevent a re-occurrence).

d) Managing conditions that may increase the risk of vitamin D deficiency. Examples include: end-stage liver disease; renal disease; fat malabsorption syndromes such as cystic fibrosis, coeliac disease and inflammatory bowel disease; or conditions treated with drugs that affect vitamin D metabolism.

e) Managing conditions that may increase the risk of skin cancer (for example, epidermolysis bullosa, Gorlin syndrome or a weakened immune system).

f) Managing conditions treated with drugs that mean increased exposure to sunlight is not advised (for example, certain antipsychotic drugs).

4.3 Key questions and outcomes

Below are the overarching questions that will be addressed, along with some of the outcomes that would be considered as evidence of effectiveness.

Questions:

- 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). 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?

- How have the health benefits and risks of sun exposure been conveyed in the media?
  - 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?
  - 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?

- 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?
  - What are people's knowledge, beliefs, attitudes and perception of the benefits and risks of sun exposure?
  - 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?
  - How do people make judgments about risk from sun exposure and how does this influence decisions about sun exposure and protection practices?
  - 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?
  - What has been the impact of increased knowledge of the benefits of vitamin D on sun exposure practices?
  - 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 SPF 15) and why?
  - To what extent do people understand the UV Index? How does it affect their sun exposure and protection practices?

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

Expected outcomes:

- Changes to the format in which sun exposure health risks and benefits are reported or depicted.

- Changes in practitioners' knowledge, intentions, ability and confidence about giving tailored advice on the benefits and risks of sun exposure, what constitutes safe sun exposure, and how often they offer such advice.

- Increases in people's knowledge of how to competently assess their individual level of risk and benefit from sun exposure.

- Increase in knowledge and awareness of:
  - the causes of non-melanoma and malignant melanoma skin cancer attributable to UV exposure (such as sunburn)
  - the risks associated with overexposure to UV

  - ways to prevent non-melanoma and malignant melanoma skin cancer attributable to UV exposure (for example, by wearing a hat in the sun, keeping in the shade, avoiding sunlight around the middle of the day, wearing protective clothing and using a 30+ SPF sunscreen)
  - where to get further advice and information.

- Changes in risk beliefs, risk perception, knowledge and attitudes in people and their behavioural intentions towards safe sun exposure.

- Changes in the intensity, frequency and duration of people's sun exposure (this could be an increase for people at increased risk of vitamin D deficiency and a decrease for people at increased risk of skin cancer) and in sun protection practices.

- Reduction in the incidence of morbidity and mortality from non-melanoma and malignant melanoma skin cancer, including eyelid malignancies, attributable to UV exposure (this may be measured in terms of a reduction in the incidence of sunburn or cumulative UV exposure).

- Reduction in the incidence of morbidity attributable to vitamin D deficiency.

- Improvements to or changes in the views and experiences of the people planning and delivering risk communication strategies and interventions on the barriers to, and facilitators for, improving safe sun exposure knowledge and sun protection practices.

- Improvements to or changes in the views and experiences of the people receiving communication strategies and interventions about improving safe sun exposure knowledge and sun protection practices.

4.4 Status of this document

This is the final scope, incorporating comments from a 4-week consultation from 3 September to 1 October 2013.

5 Further information

The public health guidance development process and methods are described in Methods for development of NICE public health guidance (2012) and The NICE public health guidance development process (2012).

6 Related NICE guidance

Published

- Ambulight photodynamic therapy for the treatment of non-melanoma skin cancer. NICE medical technology guidance 6 (2011).
- Skin cancer prevention: information, resources and environmental changes NICE public health guidance 32 (2011).
- Metastatic malignant disease of unknown primary origin. NICE clinical guideline 104 (2010).
- Skin tumours including melanoma. NICE cancer service guidance (2010).
- Promoting physical activity for children and young people. NICE public health guidance 17 (2009).
- Maternal and child nutrition. NICE public health guidance 11 (2008).
- Community engagement. NICE public health guidance 9 (2008).
- Physical activity and the environment. NICE public health guidance 8 (2008).
- Behaviour change: the principles for effective interventions. NICE public health guidance 6 (2007).
- Referral guidelines for suspected cancer. NICE clinical guideline 27 (2005).

Under development

- Vitamin D: implementation of existing guidance to prevent deficiency. NICE public health guidance. Publication expected June 2014.
- Prisons: physical conditions and diseases. NICE public health guidance. Publication date to be confirmed.

Appendix A Referral from the Department of Health

The Department of Health asked NICE to develop public health guidance on:

‘Prevention of vitamin D deficiency: safe sunlight exposure for the UK population including the benefits of sun exposure.’

Appendix B Potential considerations

It is anticipated that the Public Health Advisory Committee (PHAC) will consider the following issues:

- The target audience, actions taken and by whom, context, frequency and duration.
- Whether it is based on an underlying theory or conceptual model.
- Whether it is effective and cost effective.
- Critical elements. For example, whether effectiveness and cost effectiveness varies according to:
  - the diversity of the population (for example, in terms of the user's skin type, geographical location, age, gender or ethnicity)
  - the status of the person delivering it and the way it is delivered
  - its frequency, length and duration, where it takes place and whether it is transferable to other settings
  - its intensity.
- Any trade-offs between equity and efficiency.
- Any factors that prevent – or support – effective implementation.
- Any adverse or unintended effects.
- Current practice.
- Availability and accessibility for different groups.

Appendix C References

British Association of Dermatologists (2009) A summary of key messages to be included in public information resources for the primary prevention of skin cancer. London: British Association of Dermatologists

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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

Robinson S (2012) Treating vitamin D deficiency to cost £100m a year by 2013 . GP online, 13 February 2012.]

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Vallejo-Torres L, Morris S, Kinge JM et al. (2013) Measuring current and future cost of skin cancer in England. Journal of Public Health (e-print ahead of publication)