

## **British Photodermatology Group: Position Statement on Vitamin D**

### **Background**

Vitamin D is essential for musculoskeletal health. The sources of vitamin D are diet and skin exposure to ultraviolet B in sunlight, with sunlight being a major source in most people (1). However, the ultraviolet radiation in sunlight is the main external cause of both melanoma and keratinocyte cancers (2). Sunlight also causes photosensitivity disorders in susceptible people, and photoageing of the skin.

The sunlight exposure time to make significant vitamin D varies according to a number of environmental, physical and personal factors, but is typically short and less than the amount of time needed for skin to redden and burn (3, 4). In fact, long exposures can break down vitamin D precursors and even vitamin D in the skin, reducing benefit whilst increasing risk of skin cancer (1). Casual brief sun exposures, while taking care not to burn and avoiding deliberate tanning, can help the body become vitamin D sufficient (3).

Apart from oily fish, natural foods contain little vitamin D, but it can also be obtained through fortified foods and vitamin D supplements, the latter being particularly needed in people at risk of low levels (5).

Recently, a number of government reports have been published in the UK, including NICE guidance Ng34 concerning sunlight exposure benefit and risks (6), the population target levels of vitamin D to reach and how to achieve this through oral intake (2), and the relationship between sunlight exposure and vitamin D levels (1). The British Photodermatology Group guidance has been updated to take account of the findings of these.

## **Recommendations**

### Vitamin D and health

- Everyone needs vitamin D, which is essential for good bone and muscle health. Low levels can cause the bone disorders of rickets and osteomalacia in children, and osteomalacia in adults, and are associated with osteoporosis (2, 7).
- Whilst there are many studies linking low vitamin D levels with a range of chronic conditions including cancer, heart disease, multiple sclerosis and diabetes, it is concluded that no direct causal relationship has been shown (1, 5).

### Vitamin D status and levels

- The body's vitamin D status is best reflected by the circulating level of 25(OH)D (5)
- Blood levels of 25(OH)D below 10 ng/ml (25 nmol/L) are agreed to indicate "deficient" status and in the UK it is recommended to keep above this level throughout the year, i.e. in both summer and winter (5). The bone deficiency disorders of rickets and osteomalacia most frequently occur below this level (5).
- Some authorities including the USA/Canada (8) and European (9) agencies additionally state that a 25(OH)D level of 20 ng/ml (50 nmol/L) represents a "sufficient" status, based on bone health findings, and recommend achieving this level.
- Levels of 25(OH)D greater than 50 ng/ml (125 nmol/l) are not recommended, as side effects may occur (5, 8).
- Unlike vitamin D production in the skin following sunlight exposure, which is biologically regulated, there is the potential that vitamin D gained from supplements and fortified foods could build up to levels that are too high (1).

### Vitamin D from sunlight, and skin cancer considerations

- Sun exposure is a major source of vitamin D in the UK (1, 4, 10), but particularly when excessive, is known to be the main external cause of the majority of skin cancers, which are very common and continue to rise in number in the UK (1, 6, 11).
- Sunbed use increases the risk of skin cancer, and is not recommended as a method for enhancing vitamin D status (11, 12).
- Environmental factors (such as strength of sunlight in different times of day and season), physical factors (such as skin colour, age) and behavioural factors (such as type of clothing worn, time spent outdoors) influence risk and benefit of sunlight exposure (1).
- Darker skin people have much lower risk of skin cancer than lighter skin people (11), and also produce less vitamin D on sunlight exposure (13, 14). However there remains debate in this area (1, 15) and more research is needed to address the uncertainties. It was concluded by NICE (6) that sunlight exposure messages should be targeted differently for different population groups.
- Casual short sun exposures, taking particular care not to burn (shown by skin reddening some hours after exposure) and avoiding deliberate tanning, can help provide the benefits of vitamin D while minimising sun exposures risks (3, 4). This equates to 10-15 minutes to head, arms and legs on most days of the week in light skin people. However, some skin DNA damage does occur in light skin people even at these low doses, and hence caution is advised (14). Darker (brown) skin people can benefit from sun exposures of around 25 minutes on most days of the week (13). These times apply to the middle of the day, in summer.

#### Vitamin D from dietary supplements

- The UK Government now recommends everyone aged 1 year and above to take a 10 microgram (400 iu) vitamin D supplement a day (and slightly less, i.e. 8.5 micrograms a

day for children less than 1 year) (5). They state that people who are not in groups at particular risk of low vitamin D (see below) may only require vitamin D supplements in the winter, while those at particular risk of low vitamin D require vitamin D supplements all year round (5).

- Population groups at particular risk of low vitamin D include: pregnant and breastfeeding women, young children, older people, darker-skinned people, those who wear whole-body coverings or live in institutions (1, 5).
- Certain patient groups are also at particular risk of low vitamin D. This includes patients medically advised to minimise sunlight exposure, i.e. those with photosensitivity disorders/photodermatoses (when the skin reacts abnormally to the sun, such as pain and skin rash), patients with skin cancer, and patients with increased risk of skin cancer including people who are immunosuppressed or genetically prone (1). A blood test for vitamin D level can assess need for supplements and response to these.
- Vitamin D fortified foods such as fat spreads, and natural dietary sources particularly oily fish (including salmon, trout and sardines) can be useful for helping to maintain levels of vitamin D (5).

## References

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