Vitamin D and UV radiation

The sun's ultraviolet (UV) radiation is both a major cause of skin cancer and the best natural source of vitamin D.[1] In Victoria, it is important to take a balanced approach to sun exposure which helps with vitamin D levels, while minimising the risk of skin cancer with appropriate sun protection measures.

What is vitamin D?
Vitamin D is a hormone that controls calcium levels in the blood. It is needed to develop and maintain healthy bones, muscles and teeth and is also important for general health.[2,3]

Vitamin D is made through a series of biochemical processes starting when the skin is exposed to the sun's UV rays. Vitamin D occurs naturally in fish and eggs, while margarine and some types of milk have added vitamin D. Food however, only makes a small contribution (approx. 10%) to the body's overall vitamin D levels and it is therefore difficult to get enough from diet alone.

How do I take a balanced approach to sun exposure?
The body can only absorb a certain amount of vitamin D at a time. Prolonged sun exposure does not result in increased vitamin D levels, but does increase the risk of skin cancer. Short periods of sun exposure may be more efficient at producing vitamin D.[4] Daily exercise will also assist the body to produce vitamin D.[5]

In Victoria from September to April (when UV levels are generally 3 and above) most people need sun protection. During these months, Victorians with fair to olive skin need just a few minutes of mid-morning or mid-afternoon sun exposure on most days of the week for vitamin D levels. Be extra cautious in the middle of the day when UV levels are most intense. People with naturally very dark skin may need more sun exposure.[6]

From May to August (when UV levels generally fall below 3), Victorians with fair to olive skin need to actively seek two to three hours of midday winter sun exposure spread over each week. At these times, sun protection is not required unless near highly reflective surfaces such as snow, outside for extended periods or when UV levels reach 3 and above. People with naturally very dark skin may need more sun exposure.[6]

Solariums should never be used to boost vitamin D levels as they emit dangerous levels of UV which increases the risk of skin cancer.

Will sunscreen stop you from making enough vitamin D?
Sunscreen use should not put people at risk of vitamin D deficiency. When sunscreen is tested in lab conditions it has been shown to decrease vitamin D production, however regular use in real life has been shown to have little effect on vitamin D levels. This is probably because those people who use more sunscreen, spend more time in the sun, so naturally will have higher vitamin D levels.[7,8,9]

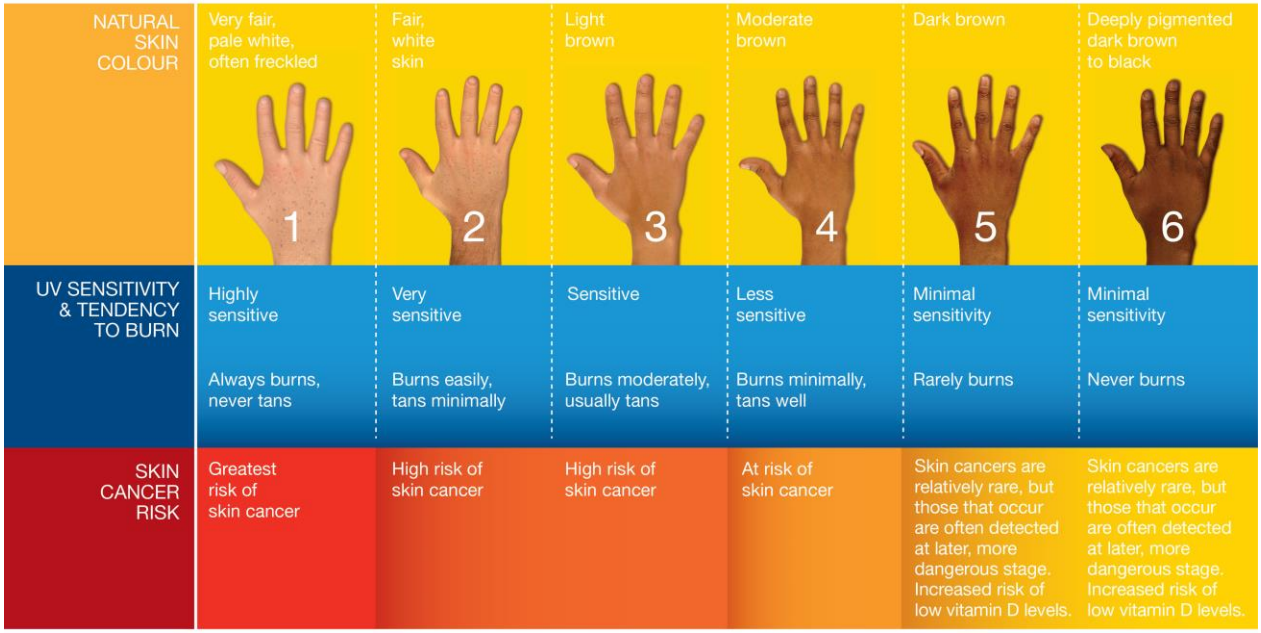
Who is at risk of vitamin D deficiency?

- **People with naturally very dark skin.** The pigment in dark skin (melanin) acts as a filter to ultraviolet B (UVB) radiation and reduces synthesis of vitamin D.[6]
- **People with little or no sun exposure.** This group includes:
  - older adults, especially the frail, who are in medium to long-term residential care, aged care or housebound[10]
  - people who wear concealing clothing for religious or cultural purposes[11]
  - people who deliberately avoid sun exposure for cosmetic or health reasons
  - people at high risk of skin cancers
  - people who are hospitalised long-term
  - people with a disability or chronic disease
  - people in occupations such as taxi drivers, factory workers, night-shift workers.
- **Breast fed babies who fall into the risk categories above or have mothers with low vitamin D**. Breast milk contains little vitamin D and infants depend on maternal stores initially (formula milk is fortified with vitamin D).[12]
- **People with conditions** (obesity, end stage liver disease, renal disease and fat malabsorption syndromes such as cystic fibrosis, coeliac disease, inflammatory bowel disease) **or medications affecting vitamin D metabolism**.

Individuals in these at risk groups and anyone else concerned about their vitamin D levels should speak with their doctor. Vitamin D levels can be checked with a simple blood test. Sun exposure may not be enough for some people and a vitamin D supplement may need to be considered, especially in winter.

Low vitamin D may have no obvious symptoms, but without treatment, it can have significant health effects including bone and muscle pain, poor bone mineralisation (softer bones) leading to rickets (bone deformity) in children and osteomalacia in adults. The evidence is unequivocal – vitamin D is crucial for bone and muscle development and in the prevention of osteoporosis. There have also been links with an increased risk of bowel cancer, heart disease, infections and auto-immune diseases, although more research is needed to determine whether increasing vitamin D levels can prevent these conditions.

Skin type chart



Skin Type Table adapted by SunSmart Victoria (2011) using Fitzpatrick Scale (1975). Images courtesy Cancer Research UK.

What is considered naturally very dark skin?
All skin types can be damaged by too much UV radiation. However, individuals with naturally very dark skin (skin type 5 and 6 on Table 1) may need more sun exposure and supplementation may be required, depending on their vitamin D levels.[6,13]

Do people with naturally very dark skin need to worry about sun exposure?
Yes – care still needs to be taken in the sun. Even though skin cancer is less common for people with naturally very dark skin, those skin cancers that do occur are often detected at a later, more dangerous stage. Individuals with this skin type do not normally need to apply sunscreen and can safely tolerate relatively high levels of UV radiation without getting burnt.[14]

However, regardless of skin colour, the risk of eye damage remains. Cataracts have blinded around 16 million people worldwide. According to the World Health Organization, sun exposure may be a factor in up to 20% of cataracts, especially in countries close to the equator, such as India, Pakistan and parts of Africa.[14] High levels of UV radiation have also been linked to harmful effects on the immune system.[14]
It is recommended that all people, regardless of skin type, wear a hat and/or sunglasses to protect their eyes.

What about children with naturally very dark skin at school and in care?
Children at school and in care usually spend at least 60 minutes a day outdoors. It is important for children with naturally very dark skin to have some sun exposure during these periods. These children do not normally need to apply sunscreen because of the high level of melanin in their skin. This is a decision for their families to make. It is recommended that all children wear a hat (and sunglasses if appropriate) to protect their eyes and face.

Further information and resources
More information is available at sunsmart.com.au or contact the Cancer Council Helpline on 13 11 20.

The Risks and Benefits of Sun Exposure position statement is available at http://www.cancer.org.au/policy-and-advocacy/position-statements/sun-smart/#jump_3

The SunSmart app with vitamin D tracker is a handy, free tool that allows users to find out the times of day when they do and don't need sun protection. Download free from Apple and Android stores.

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This information is based on current available evidence at the time of review. It can be photocopied for distribution. Vitamin D information also available in other languages.
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