Vitamin D

Vitamin D is essential for strong bones, muscles and overall health. Ultraviolet (UV) radiation from the sun is necessary for the production of vitamin D in the skin and is the best natural source of vitamin D.

UV radiation from the sun is also the main cause of skin cancer. Taking a balanced approach to sun exposure can help make sure you get enough vitamin D while minimising your skin cancer risk.

To boost your vitamin D levels when in the sun, expose at least your face, arms and hands, or equivalent area of skin. For vitamin D to be produced, your skin must not be covered with clothing.

Prolonged sun exposure will not increase vitamin D levels further, but will increase the risk of skin cancer. Solariums should never be used to boost vitamin D, as they emit dangerous levels of UV that increase the risk of skin cancer.

Daily exercise also assists with the body's production of vitamin D.

Health effects of low vitamin D

Vitamin D is a hormone that controls calcium levels in the blood. It is crucial for bone and muscle development, and for preventing osteoporosis. Vitamin D deficiency may not result in any obvious symptoms, but without treatment it can have significant health effects and increase a person's risk of musculoskeletal conditions, such as:

- Bone and muscle pain
- Rickets (soft, weakened bones) in children
- Osteopenia (weak, fragile bones) in older adults.

As well as maintaining your vitamin D levels, you also need adequate calcium in your diet to help prevent these conditions.

Low vitamin D has also been linked to an increased risk of:

- Multiple sclerosis
- Diabetes (type1 and type 2)
- Various types of cancers (particularly colon cancer)
- Heart disease
- Mental health conditions (including schizophrenia)
- Worse outcomes in stroke
- Altered immunity and other autoimmune diseases.

More research is needed to see whether increasing vitamin D levels could help prevent any of these conditions.

People at risk of low vitamin D

People who are at increased risk of low vitamin D include:

- **People with naturally very dark skin** – the pigment in skin (melanin) acts as a filter to UVB (ultraviolet B) radiation and reduces the amount of vitamin D that the body makes in the skin.

- **People with little or no sun exposure** – Some groups of people are at particular risk of receiving little or no sun exposure. They include:
- Older adults – especially people who are frail, in medium-to-long-term residential or aged care, and housebound people
- People who wear covering clothing for religious and cultural reasons
- People who deliberately avoid sun exposure for cosmetic or health reasons
- People at high risk of skin cancers and who therefore avoid exposure to the sun
- People hospitalised or institutionalised for long periods
- People with a disability or chronic disease
- People in occupations with little sun exposure, such as office workers, taxi drivers, factory workers or night-shift workers.
- **Breastfed babies with other risk factors for low vitamin D** – breastfed babies who fall into the risk categories above or have mothers with low vitamin D. Babies get their initial store of vitamin D from their mothers. While infant formula is fortified with vitamin D, breastmilk contains very little. Therefore, breastfed infants rely more heavily on their mothers' initial stores. If the mother of a breastfed baby has low vitamin D (or had low vitamin D during pregnancy) then her baby is also at risk of low vitamin D.
- **People with medical conditions or medications affecting vitamin D metabolism,** including:
    - Obesity
    - End-stage liver disease
    - Kidney disease
    - Conditions that cause fat malabsorption (such as cystic fibrosis, coeliac disease and inflammatory bowel disease)
    - Use of some drugs that increase the breakdown of vitamin D (such as rifampicin and some anticonvulsants).

If you are concerned that you or your child may be at risk of vitamin D deficiency, you should discuss this with your doctor.

Vitamin D and food

There are small amounts of vitamin D in some foods such as fish, eggs and UV-irradiated mushrooms, but it is difficult to obtain enough vitamin D from diet alone. Most people only get five to 10 per cent of their vitamin D from food. Margarine and some types of milk have added vitamin D.

Vitamin D and safe sun exposure

UV levels vary depending on the time of year, and the amount of sun exposure required varies accordingly. Too much sun exposure can increase the risk of skin cancer, so it's important to find a sensible balance between sun exposure for vitamin D and protection against skin cancer.

The 'daily sun protection times' indicate when the UV is forecast to be three or above. During these times, people with fair to olive skin should use a combination of sun protection measures (sunscreen, hat, protective clothing, sunglasses and shade).

People with naturally very dark skin may not need to wear sunscreen, but should still protect their eyes from the sun, with sunglasses or a hat. People with this skin type may need three to six times as much sun exposure as people with fair to olive skin.

Check the SunSmart UV Alert for daily sun protection times for your location, available as a free SunSmart smartphone app, or online (sunsmart.com.au).

UV levels in Victoria

As shown in the table below, from September to April, average UV levels in Victoria are three and above for much of the day. This level of UV increases the risk of overexposure and skin damage, and requires sun protection. Be extra cautious in the middle of the day when UV levels are most intense. Sunscreen use at these times is advised, and should not put people at risk of vitamin D deficiency.

From May to August, average UV levels in Victoria are low (below three), making it a great time to roll up your sleeves and get some winter sun.

Table 1. Safe sun exposure in Victoria, to reduce the risk of low vitamin D

Time of year	Skin type	UV exposure required	Sun protection required	Other
September to April (UV levels three and above for much of the day)	**Fair to olive skin**	A few minutes of mid-morning or mid-afternoon sun exposure to the face, arms and hands (or equivalent area of skin) most days of the week.	A combination of sun protection measures is needed during these months: sunscreen hat protective clothing sunglasses shade. Be extra cautious in the middle of the day when UV levels are most intense.	
	Naturally very dark skin	Three to six times the level of exposure required by people with fair to olive skin.	It may not be necessary for people with this skin type to wear sunscreen. Eyes should be protected from the sun with sunglasses or a hat.	Vitamin D supplements may also be required.
May to August (UV levels mostly below three)	**Fair to olive skin**	Approximately two to three hours of midday sun exposure to the face, arms and hands (or equivalent area of skin) spread across the week.	Not needed, except for people: in alpine regions outside for extended periods near highly reflective surfaces such as snow or water.	
	Naturally very dark skin	Three to six times the level of exposure required by people with fair to olive skin.	Not needed, except, perhaps, for people:	Vitamin D supplements may be required as it may not be possible to maintain vitamin D levels through sun exposure alone at this time of year.

			in alpine regions outside for extended periods near highly reflective surfaces such as snow or water. Even in these conditions, it may not be necessary for people with this skin type to wear sunscreen, but you should still protect your eyes from the sun with sunglasses or a hat.	

Low vitamin D

If you are concerned about your vitamin D levels, seek advice from your doctor. A simple blood test can determine your level and assess your risk. If you are at risk of low vitamin D, you will need to have regular medical check-ups to monitor your levels.

Your doctor may recommend vitamin D supplements, which should be taken strictly as directed. Once low vitamin D is treated, the aim is to maintain normal vitamin D levels.

Where to get help

- Your doctor
- Maternal and child health nurse
- Dietitians Association of Australia Tel. 1800 812 942
- NURSE-ON-CALL Tel. 1300 60 60 24 – for expert health information and advice (24 hours, 7 days)

Things to remember

- Vitamin D is essential for strong bones, muscles and overall health.
- The sun is the best natural source of vitamin D, but you need to balance sun exposure with skin cancer risk.
- Daily exercise also assists with the body's production of vitamin D.
- Solariums should never be used to boost vitamin D as they emit dangerous levels of UV that increase the risk of skin cancer.
- Some people are at increased risk of low vitamin D – this includes people with naturally very dark skin and people who have very low exposure to sunlight.

This page has been produced in consultation with, and approved by:

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