

Ultraviolet Radiation and Vitamin D

— A special note for people with dark skin



This Information Sheet provides information on why we need vitamin D, with a special focus on people with dark skin. It also provides advice on what to do if you think you or your family members may have low levels of vitamin D.

What is vitamin D?

Vitamin D is needed to control calcium levels in the blood. It is also necessary for the development of healthy bones, muscles and teeth. Other possible benefits include protective effects against various cancers, heart disease and some auto-immune disorders.¹

How is vitamin D made?

Vitamin D is formed in the skin when it is exposed to Ultraviolet B (UVB) radiation from the sun. Vitamin D is stored in fat and muscle and slowly released. Vitamin D can also be obtained from foods in which it occurs naturally, such as:

- oily fish
- eggs and meat or
- fortified foods, such as margarine and some milk products.

However, food sources make a small contribution to a person's total vitamin D level.

Vitamin D supplements are also readily available, without medical prescription, over the counter in pharmacies. However, it is best to consult your general practitioner (GP) about your vitamin D status including whether supplementation is necessary. Note: vitamin D supplements can be toxic in large doses.

How much sun exposure is healthy?

Very little research is available to determine exactly how much sun exposure is necessary to maintain adequate vitamin D levels.² Vitamin D levels are influenced by variations in age, skin colour, geographical location, time of day and time of year. For these reasons, it is inappropriate to provide the same advice to the whole population.³

Skin colour classification

The Fitzpatrick skin type scale is an international skin type classification, which identifies differences in skin type and sensitivity to sunburn.

Fitzpatrick Skin Type Classification

Skin type 1	Always burns, never tans; sensitive to sun exposure; redheaded, freckles
Skin type 2	Burns easily, tans minimally; fair-skinned, blue, green or grey eyes
Skin type 3	Burns moderately, tans gradually to light brown
Skin type 4	Burns minimally, always tans well to moderately brown; olive skin
Skin type 5	Rarely burns, tans profusely to dark; brown skin
Skin type 6	Rarely burns, least sensitive; deeply pigmented skin

Skin Type/Colour and Ethnicity— Considerations for New Zealand

Currently, there is no way of knowing the relationship between skin type/colour and ethnicity among the New Zealand population.⁴ New Zealand also has high marriage rates between various ethnic groups, which is likely to affect skin colour.⁵

People with naturally very dark skin (ie Fitzpatrick skin type 5 and 6) who rarely or never burn as a result of sun exposure are relatively protected against skin cancer by the large amount of melanin (dark pigment) in their skin. People with this type of skin often come from or can trace ancestry back to countries around central and northern Africa. In New Zealand, an increasing proportion of the population has Māori, Pacific and Asian ancestry. Many in these groups are likely to have only moderately dark skin (ie Fitzpatrick skin types 3 and 4) that burns moderately or very little, and they may still be susceptible to skin cancer. One small study found that “self-defined Māori include a full range of skin types and a sizable proportion with a tendency to sunburn”.⁶

Between 1997 and 2005, the numbers of people with melanoma increased among Māori and Pacific Peoples.⁷ These groups have also been found to have, on average, lower levels of vitamin D in their blood than European New Zealanders.⁸

If you have dark skin and cover yourself for religious or cultural reasons, less of your skin is exposed to UV radiation. Less exposure to UV radiation will reduce the amount of vitamin D produced by your body. The Cancer Society advises people who cover up in this way have their vitamin D levels checked by their GP. Their GP may advise them to take a vitamin D supplement.

During winter, particularly in the south of New Zealand where UV radiation is very low, vitamin D status may fall below adequate levels. Additional measures, such as supplements, to achieve adequate vitamin D levels may be required, particularly for those at risk of vitamin D deficiency. Although summer levels of vitamin D affect winter levels, body stores decline during winter. The body can rely on its stores of vitamin D for anywhere between 30 and 90 days.⁹

What about babies and infants of vitamin deficient mothers?

Babies and infants of mothers with inadequate vitamin D levels are also likely to be vitamin D deficient. Babies most at risk are those who are breastfed by mothers who are vitamin D deficient. Where there is vitamin D deficiency, a vitamin D supplement—rather than relying on sun exposure—may be necessary. Talk to your GP about whether you need to take a vitamin D supplement.

What about children at school?

School children may spend time outdoors during the school day. Given that people with dark skin need greater sun exposure to produce vitamin D, it is important for these children to receive some sun on their skin during the school day. Although all children need to take care when out in the sun, children with dark or very dark skin (ie Fitzpatrick skin types 4 to 6) do not normally need to apply sunscreen, which reduces vitamin D absorption. This is because of their high level of melanin. For short periods, such as during lunchtime, children with moderately dark skin (ie Fitzpatrick skin type 3) may not need to apply sunscreen. This is a decision for their parents/caregivers to make. However, the Cancer Society recommends that all children should wear a hat to protect their eyes and face, as eye damage from UV radiation affects all skin types. As is the case with babies and infants, where there is vitamin D deficiency, talk to your GP about whether there is a need for vitamin D supplementation.

Do you need to worry about sun exposure?

Yes—care still needs to be taken in the sun. Even though skin cancers occur less frequently among people with dark skin, those that do occur may more often be detected at a later, more dangerous, stage in development. In New Zealand, this is the case for Māori and Pacific Peoples. Excessive, harmful sun exposure can also cause damage to the eyes, such as contributing to the development of cataracts (a clouding in the clear lens of the eye which affects vision). High levels of UV radiation have also been linked to harmful effects on the immune system (the body’s ability to fight disease).

Summing up

- If you have very dark skin you may be at higher risk for vitamin D deficiency.
- If you have very dark skin it may not be necessary for you to apply sunscreen.
- If you are at risk of vitamin D deficiency, and not able to increase your outdoor sun exposure, visit your GP for a blood test and ensure you have regular follow-ups. Take vitamin D supplements if advised by your GP, ensure you have a well balanced diet, and exercise moderately each day to maintain healthy bones.
- The risk of other health effects related to sun exposure, such as eye damage and the body's ability to fight disease, are independent of skin colour.
- Between September and April (especially between 11 and 4) or when the Ultraviolet Index (which measures the intensity of UV radiation) is 3 or above it is important to use sun protection, including wearing a broad-brimmed hat, shirts with collars and long sleeves, broad-spectrum SPF30+ sunscreen and sunglasses.
- Further scientific investigation of the amount of UV radiation exposure required to ensure adequate vitamin D levels for people of different skin types in New Zealand is needed.

References

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