

Make D When the Sun Shines

Vitamin D has long been known to boost bone health. In recent years, it has gained a reputation as a cure-all supplement, with usage and testing growing rapidly. In the wake of COVID-19, proposed links with vitamin D levels and infection have further increased attention on the sunshine vitamin. In this month's feature article, Rory O'Donnell and Naomi O'Farrell of totalhealth and Haven Pharmacies take a closer look at vitamin D benefits.



Rory O'Donnell, MPSI,
O'Donnell's totalhealth Pharmacy
Derrybeg, Donegal



Naomi O'Farrell,
Head of Professional Services,
totalhealth and Haven Pharmacy



What is Vitamin D?

Vitamin D, or 'calciferol', is a fat-soluble vitamin essential for musculoskeletal health by promoting the regulation of calcium and phosphorus (Nice, 2021). It circulates in the blood as Vitamin D3 and Vitamin D2. Vitamin D3 is synthesised in the skin through exposure to sunlight. Vitamin D3 and Vitamin D2 can also be obtained from food sources, fortified foods, and supplements (SACN, 2016). Adverse health outcomes associated with lack of vitamin D include autoimmune disorders, diabetes, cardiovascular issues, cancer, cognitive impairment, as well as poor bone health (Engleman, 2011). Media coverage of the widespread benefits of vitamin D, alongside more recent reports of links with COVID-19 and vitamin D deficiency, have led to increased interest in vitamin D testing and use of supplements.

How much Vitamin D do we require?

The amount of vitamin D required varies by age, health status, sun exposure, and skin colour, depending on how much is likely to be absorbed through sunlight or diet, or because of health conditions. The recommended

level of vitamin D for children over 4 years and adults under 65 years is 10 micrograms per day. While this is usually successfully obtained through sunlight and diet, some groups may require supplementation, either through a specific vitamin D supplement or a general multivitamin. Certain groups of people are advised to take vitamin D supplements, and while the guidance varies by country, the Irish Department of Health recommend the following:

- Breast-fed babies should be given 5 micrograms of vitamin D as a supplement every day from birth to 12 months
- Formula-fed babies should not have a vitamin D supplement unless they take less than 300ml of infant formula per day
- Children from the age of 1 year to 4 years need a vitamin D supplement every day for a few months each year – from Halloween (31st October) to St Patrick's Day (17th March), they should be given 5 micrograms of vitamin D every day
- Adults aged 65 and older should take a vitamin D supplement of 15 micrograms every day at all times of year.

Sources of Vitamin D

Most healthy people should get the necessary levels of vitamin D from sunlight from late March until the end of September. During the winter months in Ireland, with inadequate levels of sunlight, vitamin D is absorbed through diet or supplements. Good food sources of vitamin D include:

- Red meat
- Oily fish
- Egg yolks
- Foods that have been fortified to include vitamin D such as milk, cheese, yoghurt, and breakfast cereals.

Sensible Sun

The most natural method of vitamin D absorption is sunlight, although it is not known exactly how much exposure is needed to meet the body's requirements (NHS, 2018) because of the variables affecting absorption due to location, skin colour, and how much skin is exposed. The risks of over-exposure to harmful UV rays from sunlight must be balanced with vitamin D requirements. The World Health Organisation advises that in most cases, casual exposure to sunlight for short periods each day is usually enough to meet the body's needs, while the danger of over exposure is far greater than underexposure. Midday sun should be avoided

without SPF protection and attention must always be paid to the UV index. The Irish Cancer Society offers the following advice to minimise the danger of over exposure to the sun's potentially harmful effects:

- Never let skin redden or burn
- Be extra cautious of sun exposure if you have fair skin
- Never use a sunbed to get your vitamin D needs
- Always use a broad-spectrum sunscreen that protects against UVA and UVB rays – minimum SPF of 30.

What are the risks of vitamin D deficiency?

There are groups of people who may be absorbing insufficient levels of vitamin D through poor diet, health conditions, or inadequate sunlight exposure. According to the HSE, studies show that adults and children in Ireland have insufficient levels of vitamin D. A lack of vitamin D in children can lead to bone deformities such as rickets. In adults, not enough vitamin D can cause a condition called osteomalacia.

Those at risk of insufficient levels and who should take a vitamin D supplement include:

- People who are not often outdoors

- Those living in residential institutions, such as care homes
- People who wear clothes that cover all of their skin when they are outside
- Those who have a dark skin tone.

Those who are obese or who have certain medical conditions may also be at risk from low vitamin D. Certain diets, for instance vegan, may also result in less intake of foods that are fortified with vitamin D. Potential symptoms of vitamin D deficiency include bone pain, muscle weakness, and bone fractures.

Risks of Excessive Vitamin D

Vitamin D at excessive levels, referred to as hypervitaminosis D, is toxic (National Institutes of Health, 2021). Excessive sun exposure or diet are not believed to cause hypervitaminosis D; suspected causes included overuse of supplements and sunbed use. There have been various studies and consequent media coverage proposing links between vitamin D deficiency and COVID-19 (which have yet to be universally accepted), which paves the way for unsuitable use of vitamin D supplements.

Too much vitamin D can result in an excess of calcium building up in the body (hypercalcemia), leading to a weakening of bones as well as damage to the kidneys and

heart (HSE, 2022). Symptoms of hypercalcemia include:

- Fatigue
- Loss of appetite
- Weight loss
- Excessive thirst
- Excessive urination
- Dehydration
- Constipation
- Irritability, nervousness
- Tinnitus
- Muscle weakness
- Nausea, vomiting
- Dizziness
- Confusion, disorientation
- High blood pressure
- Heart arrhythmias.

Hypervitaminosis D risk is increased in those with certain medical conditions, including liver disease, kidney disease, tuberculosis, and hyperparathyroidism. Long-term dangers and complications include kidney stones, kidney failure, excess bone loss, and calcification of arteries and soft tissues.

Excessive use of vitamin D should be cautioned, with patients advised of the recommended dosages of supplements, as well as reminded to look at vitamin D and calcium amounts in other supplements and foods being consumed.