

Vitamin D and Child Health Information Sheet

There has been much press coverage of vitamin D and health in the last few years. Many adults and children take vitamin D supplements, either on its own, or as part of another supplement. However the dose that people take varies greatly. Vitamin D, like all vitamins, is essential and has several important functions in the body and brain that scientists are only just beginning to understand. Also just like other vitamins, taking very high doses might not help and could be harmful. However, because we get most of our vitamin D by exposing our skin to the summer sun, many people in Scotland could do with a little extra.

This information sheet was produced primarily to support a specialist dietetic clinic for children with neurodevelopmental disorders. It describes emerging evidence on the importance of vitamin D for health and wellbeing. It should give families enough information to help them decide if a vitamin D supplement might be helpful for their child.

Vitamin D and healthy bones.

It is quite common for people in Scotland to have too low a level of vitamin D in the blood. A recent study showed that a third of Scottish adults have too little vitamin D for healthy bones. This can increase the risk of rickets in children, osteoporosis in adults, and bone fractures generally. It is widely accepted that vitamin D is essential for good "*Musculoskeletal health*".

Vitamin D and other aspects of health & wellbeing.

In addition, some conditions that involve the immune system or inflammation, are more common in populations that have low levels of vitamin D. These include eczema, diabetes, inflammatory bowel disease, heart problems, bowel cancer and multiple sclerosis. We also know that vitamin D is required in gene regulation, neurodevelopment and normal brain function. Low vitamin D levels are more common in autism, ADHD, depression and dementia.

The link between poor health and low vitamin D could just be a coincidence of course. There is currently too little evidence to know whether or not vitamin D can help reduce the risk of these conditions. We also do not know if vitamin D can help manage symptoms in any of these conditions (although some studies have shown success in treating depression). However we do know that vitamin D can influence inflammatory and immune processes and is needed in the brain. It makes sense to ensure that you have enough vitamin D for healthy bones at least. If you do, it may have other health benefits for other parts of the body and brain too.

Too little or too much of a good thing?

For many nutrients, including vitamin D, there is a difference between the amount required to prevent physical signs of deficiency, and the larger amount associated with the best health and wellbeing. However, there is also a point above which more is not helpful, and a lot more is potentially harmful. Read on for more information about likely effective and safe vitamin D intakes.

Vitamin D and sunlight

The main source of vitamin D is exposure of the skin to sunlight in the summer months. However, Scotland has a short summer with relatively few sunny days. Also, many people spend more time indoors than we did historically. It has been assumed, for many years, that spending 10 to 15 minutes outside per day in summer

with face and forearms exposed, will allow the skin to produce enough vitamin D to meet our needs. However, some argue that this assumption fails to sufficiently take account of the weather and latitude of Scotland. In addition, skin cancer rates are rising so people use sun screen to reduce this risk. Finally, people with a dark skin tone (eg: people of African Caribbean and South Asian ethnicity), have high levels of melanin and are less able to synthesise vitamin D in their skin.

Vitamin D and sunscreen

The use of sunscreen is entirely appropriate to prevent the skin burning. However, exposing the skin to some sun, in summer, without sunscreen is also important so that vitamin D can be produced. The more skin that is exposed, the more vitamin D is produced. Most is produced between April and September. Make sure that you apply sun screen, clothing or go indoors or into the shade **before** burning. How long this takes depends on your skin and the power of the sun of course. Remember that foundation make-up often contains sunscreen too.

Vitamin D deficiency and indoor lifestyle

Some people burn very easily or are on medication where it is not safe for the skin to be exposed to a lot of sun. Some people have occupations and working hours that make it difficult to get enough sun. Others just prefer to stay out of the sun or generally prefer time indoors to time outside. Living in Scotland already puts people at a greater risk of vitamin D deficiency. People who are unwilling or unable to spend time outdoors are at even greater risk of vitamin D deficiency than the average person in Scotland.

Vitamin D and Diet

Vitamin D can come partly from the diet. Liver and oily fish are quite rich sources. Dairy products, eggs, mushrooms, meat, margarine and infant formula milk also contain some vitamin D. It is quite difficult to get enough vitamin D from your diet alone (except for formula fed babies). Even if you did, it might not be a very healthy or balanced diet if it is very high in dairy products, liver or margarine.

Vitamin D Supplements

The European Food Safety Authority (EFSA) are suggesting an adequate intake (AI) for children (over 12 months of age) and adults, is 15micrograms per day (EFSA consultation document, March 2016). This is for “*musculoskeletal health*” only. It also assumes minimal exposure to sunlight and so is quite relevant to Scotland. The 15 micrograms per day figure is also the same as the recommendation of the Food & Nutrition Board (USA).

EFSA have also set a **safe upper tolerable level (UL) of 100micrograms** per day. This should not be exceeded. It may be that there a range of health benefits from having higher intakes of vitamin D than 15 micrograms. For example, some studies have used vitamin D supplements to treat depression. In these studies, only the ones giving 20 micrograms per day or more were effective. The evidence to support this is not yet available to make any firm recommendations about benefits that are not musculoskeletal. **The main thing is to ensure the adequate intake of 15 micrograms per day is achieved and that the upper limit is not exceeded.**

Vitamin D supplements are available as tablets, capsules or liquid drops. They can be purchased “over the counter” without a prescription. Many infants, pre-school children and pregnant women are already taking some vitamin D as part of the “Healthy Start” vitamin supplement (www.healthystart.nhs.uk).

In some specific cases such as rickets, intestinal malabsorption, chronic liver disease, hypoparathyroidism, and osteoporosis, vitamin D may be prescribed by your doctor, either on its own or with calcium. If, for any reason, your doctor has tested your vitamin D levels and found that you are deficient, they might prescribe vitamin D, possibly at a fairly high dose, for a limited period of time. The intakes described in this information sheet assume that blood testing is not available and that you might be taking this dose on long term basis.

Most supplement packaging in the UK, says how much vitamin D the supplement has in micrograms or μg . (The first letter is Greek. It is like a “u” but with a tail on the left). Some supplements are described in “Units” or “International Units” or “I.U” for short. To help you convert one unit to the other, use the following:

- 1 “I.U” = 0.025 μg .
- 1 μg = 40 International Units.
- A dose of 15 μg = 600 IUs.

Cautions

When you are working out what dose to take, remember that other supplements and infant formula milk may already be providing quite a bit already:

- Vitamin & mineral supplements or cod liver oil often provide 5 to 10 micrograms per daily dose already. Check the label carefully.
- Children who are taking over 500mls (1 pint or 16 ounces) per day of formula milk or “follow on” or “growing up” milks will already be getting vitamin D and may not need a supplement at all. If you do still want to provide a supplement, you will need to calculate carefully to avoid giving too much from the milk and supplements combined. Once again, check the label (remember that human breast milk is the best source of nutrition for babies).
- Do not exceed the recommended dose of the “*Healthy Start*” vitamin, in order to get more vitamin D. This could lead to too high an intake of folic acid or vitamin A (both of which are also in this supplement).
- Vitamin D should only be used with caution and under medical supervision, in cases of hypercalcaemia.