

Vitamin D deficiency

Children's Hospital

Information for Patients

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What is Vitamin D?

Vitamin D is needed for developing and keeping bones and muscles healthy, especially in growing children. Vitamin D controls calcium levels in the blood, which is also needed for developing healthy bones.

Where do we get vitamin D from?

Most of our vitamin D (90%) is made in the skin with the help of sunlight (UVB rays). UVB sunlight is available in the UK between 10am to 3pm from April to September. Unlike other vitamins, only a small amount (10%) comes from the food we eat, even if we have a healthy diet.

What causes vitamin D deficiency?

Low levels of vitamin D (vitamin D deficiency) is caused mainly due to lack of sunlight in UK. This is also made worse by the mostly cloudy weather and long winter.

What happens if you don't have enough vitamin D?

Most children have no symptoms, or minor ones such as tiredness or aches. Children with low vitamin D can develop a condition called Rickets. Symptoms include bone pains, delays in walking and soft leg bones (bow legged).

Very rarely in severe vitamin D deficiency where calcium is also very low, symptoms of muscle spasms (cramps) and fits can happen. Some infants born to vitamin D deficient mothers also develop heart failure due to thickening and weakening of the heart muscle. Long term vitamin D deficiency increases the risk of developing weak bones (osteoporosis).

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How common is vitamin D deficiency?

It is very common among both children and adults in the UK. Certain groups of children are at higher risk and these include children with darker skin (Black and Asian ethnicity) if they spend limited time in the sun (veiled, sun sensitive skin, etc.); children with limited movement who may spend little time outdoors; those not having enough calcium in their diet; those on anticonvulsant medication; and if you have family members who also have vitamin D deficiency.

Infants born to mothers with low vitamin D levels have very low body stores of vitamin D at birth. While breast milk is the best food for babies, it contains only a very small amount of vitamin D so these babies will remain low in vitamin D. Many children with vitamin D deficiency also have low calcium in their diet. As their bones are growing, this puts them at high risk of low calcium levels and weak bones.

How is vitamin D deficiency diagnosed?

Vitamin D deficiency is diagnosed with a blood test. The test will be done if there are symptoms and risk factors to vitamin D deficiency.

What is the treatment for vitamin D deficiency?

The treatment is to take a vitamin D supplement. Vitamin D is available as liquid, tablet or injection. The liquid form is most widely used for treatment in children. It is taken once daily for 6 to 8 weeks, up to 12 weeks as advised by your doctor. It can be taken at any time of the day with or without food. The dose will be advised by your doctor and you may need a repeat prescription from your GP to finish the course of treatment. Once the treatment is completed, your child will need a plan to maintain the normal level as advised below.

Occasionally, your child may need extra calcium if their calcium level is low but you will be advised by your doctor.

Are there any side effects from vitamin D treatment?

It is very unusual to get side effects from vitamin D if taken in the prescribed dose.

How can I improve my child's vitamin D levels and prevent vitamin D deficiency in the future?

It is very important to maintain the right level of vitamin D in the blood. Here are some helpful things you can do particularly amongst the high risk group:

As sunlight is the main place that we get vitamin D from, your child should have short periods of time in the sun.

Please be aware:

- Most people can make all of the vitamin D they need by going out for short periods and leaving only areas of skin that are often exposed uncovered (such as forearms, hands or lower legs) and without sunscreen from late March or early April to the end of September, especially if at some point between 11am to 3pm.
- It is not known how much time is needed in the sun to make enough vitamin D to meet body's needs because there are other things that affect this such as skin colour and how much skin is exposed. The advice is to be careful not to burn in the sun to reduce the risk of skin cancer, so take care to cover up or protect the skin with sunscreen before the skin starts to turn red or burn.
- Sunscreen can block the skin from making vitamin D. Getting the right amount of sun exposure time to make the right amount of vitamin D but not getting sunburn changes from person to person. Be careful not to burn in the sun and apply sunscreen before the skin turns red or burns. Being out in the sun without sunscreen when the skin starts to turn red or burn doesn't mean that more vitamin D will be made but will damage the skin.
- You cannot get enough vitamin D by sitting next to a closed sunny window.
- People with genetically darker skin need more time in sunlight to produce the same amount of vitamin D as people with lighter skin.
- Children under 6 months of age should be kept out of direct strong sunlight.
- You can't get enough vitamin D from sunlight between October and end of March in the UK.

The NHS website has further information here: <https://www.nhs.uk/conditions/vitamins-and-minerals/vitamin-d/>

Diet

Vitamin D that we get from our food can help to improve our vitamin D levels. Vitamin D can be found in oily fish (tuna, salmon, and mackerel), eggs and fortified food like some breakfast cereals, yoghurt and most infant formula. Your child should also have daily foods which contain calcium. This can be found in milk and milk products such as yoghurt, cheese, etc.

The Department of Health (DoH) recommends everyone to consider taking a daily vitamin D supplement during the winter months (early October to end of March) to avoid vitamin D levels dropping due to lack of sunlight, particularly in the high risk group, unless the child is drinking 500ml or more of infant formula as formula milk has added vitamin D.

Daily vitamin D supplements should be at least:

- From birth to 1 year age: 8.5 to 10 micrograms (= 340 to 400 units or IU) daily
- Aged 1 to 4 years: 10 micrograms (= 400 units or IU) daily
- Over the age of 4 years: 10 micrograms (= 400 units or IU) daily

The amount of vitamin D in supplements that you can get in the UK can be written in either units, international units (IU) or microgram. 1 microgram (µg) of vitamin D = 40 units or IU.

Can you have too much vitamin D supplement?

Children who are at high risk of vitamin D deficiency can take the vitamin D supplement all year round unless there is a change in the amount of sun they are exposed to and they are no longer at high risk of low levels.

If you choose to give vitamin D supplement to your child, 10 micrograms (= 400 units or IU) a day is safe for throughout the year. Children aged 1 to 10 years shouldn't have more than 50 micrograms (= 2000 units or IU) a day, and infants under 12 months shouldn't have more than 25 micrograms (= 1000 units or IU) a day. If the vitamin D is given as a multivitamin preparation with other vitamins included, be careful not to give more than these amounts in total.

Please talk to your pharmacist or doctor for help with this if you need it.

Does vitamin D deficiency affect other family members?

If your child has been found to have low vitamin D, it is highly likely that the rest of the family have the same problem. If you are a mother who is breastfeeding or planning future pregnancies, it is very important that you get your vitamin D levels checked. Please seek advice from your GP.

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