

Patient information from BMJ

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Vitamin D deficiency

Not getting enough vitamin D can cause serious health problems in adults and children, including weak or deformed bones, and severe kidney damage.

Vitamin D deficiency is the most common vitamin deficiency worldwide and is underdiagnosed. But it is easy to treat.

What is vitamin D deficiency?

Vitamin D deficiency simply means that you don't have enough vitamin D in your body. It is a very common problem. In the US, 40 in every 100 people over the age of 50 don't get enough vitamin D.

Vitamin D is vital for staying healthy. Foods that contain vitamin D include:

- fatty fish, such as mackerel and salmon
- calves' liver
- cheese
- egg yolks.

But most foods contain little or no vitamin D. And even foods that are rich in vitamin D, or "fortified" with extra vitamin D, wouldn't give us enough of it from a normal diet. So we can't get enough of it from what we eat.

The main way we get vitamin D is from sunlight on our skin. But you might not get much vitamin D this way if:

- you don't spend much time outside
- you live somewhere that doesn't get much sun for much of the year
- you have dark skin. The brown pigment in dark skin blocks most of the sun's rays
- you are always covered up when you go outside, or
- you always wear sunscreen in the sun.

You will probably have heard that spending too much time in the sun can increase your chance of getting skin cancer. This is certainly true, especially if you get sunburn.

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But vitamin D deficiency is linked to many more health problems, including:

- some cancers, including prostate cancer and breast cancer
- severe kidney damage
- autoimmune diseases (where your immune system attacks your own cells)
- type 2 diabetes
- heart disease
- high blood pressure
- infections, and
- weak bones and teeth.

Spending a sensible amount of time in the sun, without getting burned, can help you get the vitamin D you need to help protect against these problems. So the sensible sun message is that:

- a little sun is good for you
- but don't get burned. Avoiding sunburn helps prevent skin cancer.

What are the symptoms?

People with a mild vitamin D deficiency probably won't have any symptoms. But that doesn't mean it's not a problem. Having even a mild vitamin D deficiency means you are more likely to get one of the conditions listed above.

People with a serious deficiency might have more noticeable symptoms.

In children, the most obvious result of vitamin D deficiency is a condition called rickets. Rickets is not common in countries where most children get good nutrition. It is more common in poorer countries and where there is a low level of education about nutrition.

In children with rickets, the bones become weak and can bend under pressure. This can cause bow-leggedness and deformed bones in the forearms. These bone problems usually appear when the child is between 6 months and two years old.

Children with rickets or a severe vitamin D deficiency might also:

- grow more slowly than healthy children
- have pain in their bones
- be irritable, probably because of the pain in their bones
- struggle or fail to do the physical things that healthy children of their age do, such as walking and running, moving easily, and using their hands for certain tasks
- have delayed tooth development and other dental problems
- have cramps, weakness, or numbness in their muscles

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- have spasms or seizures.

People who develop severe vitamin D deficiency as adults don't usually have the bone deformities that can occur in children. But they might have other symptoms in their bones, including:

- bone pain
- pain in the hips, which can cause a "waddling" gait when they walk
- tiredness and a general feeling of being unwell (this is called malaise).

The main health problems caused by vitamin D deficiency in adults are weak bones, which can lead to falls and fractures, and kidney damage.

If your doctor thinks that you or your child has vitamin D deficiency, or problems with your bones caused by lack of vitamin D, he or she might suggest blood tests, or x-rays to check your bones.

What treatments work?

Treating vitamin D deficiency is usually simple. Sensible sun exposure and vitamin D supplements are usually all that's needed.

In children, treating the deficiency will help bones to grow normally and become strong. In adults, the bones will become stronger and less painful.

In most countries, most people can get enough vitamin D from the sun in spring and summer if they spend a sensible amount of time outside and are not completely covered up. For example, having bare arms should be enough.

But in many countries getting vitamin D in winter is a problem. Health authorities in many countries now recommend that people take vitamin D supplements at these times.

The amount of vitamin D you need for good health depends on a variety of things, including:

- your age. Older people might need more vitamin D
- how severe your deficiency is
- whether you are taking any medications that can affect how your body absorbs vitamin D
- whether you have a medical condition that stops you absorbing vitamin D properly. These include celiac disease, cystic fibrosis, liver failure, and Crohn disease. If you have had bariatric (weight-loss) surgery you will also be less able to absorb vitamin D
- your body weight. People who are very overweight might need to take more vitamin D.

In children with a severe deficiency, doctors recommend a course of high-dose vitamin D supplements for 6 to 8 weeks, followed by a lower dose that they will need to take for the rest of their lives.

In many countries it is also recommended that very young children who are getting nutrition only from their mother's milk should be given vitamin D supplements.

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Some people who don't absorb supplements well might need to use a sunbed. If this applies to you, your doctor will tell you what type of tanning bed is suitable and how much time it is safe to spend on a tanning bed.

Too much sunbed use can cause sunburn and increase your chance of getting skin cancer.

Your doctor will also recommend calcium supplements, as calcium is essential for strong bones.

Is it possible to have too much vitamin D?

Yes. You should not take more vitamin D than your doctor recommends. Taking too much vitamin D in the form of supplements can cause serious health problems, including heart and kidney problems.

What will happen?

Treating vitamin D deficiency is easy and usually produces good results.

Most bone problems in children get better after treatment, usually within 6 months. And the earlier they get treatment, the better the outlook.

Adults also have great improvements in bone strength and other symptoms within a year or two.

People treated for a severe vitamin D deficiency will probably need to take vitamin D supplements for the rest of their lives.

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