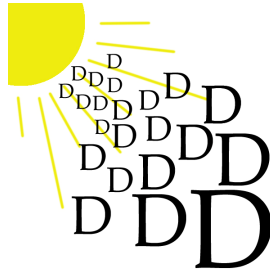


Name: \_\_\_\_\_

Vitamin D level: \_\_\_\_\_  
(Under 25: definitely low. 26-50: slightly low)  
(51-75: borderline)



[This version is designed to print as serial pages on A4 in landscape format]

## Vitamin D Deficiency

Your blood test shows a low Vitamin D level.

This is a very common condition in the UK. Most affected people either don't have any symptoms, or have vague aches and pains, and are unaware of the problem.

## Why we need Vitamin D

A main action of Vitamin D is to help calcium and phosphorus in our diet to be absorbed from the gut. Calcium and phosphorus are needed to keep bones healthy and strong.

Vitamin D may also help to prevent other diseases such as cancer, diabetes and heart disease.

Control of cell growth, nerve and muscle and immune function, and reducing inflammation depends on Vitamin D as well.

A mild lack of vitamin D may not cause symptoms but can cause general aches and pains. A more severe lack can cause serious problems such as rickets (in children) and osteomalacia (in adults).

## Where we get Vitamin D

A main source of vitamin D is made by our own bodies. It is made in the skin by the action of sunlight.

This is a good thing because most foods contain no or very little vitamin D naturally. Foods that contain vitamin D include:

- Oily fish (such as sardines, pilchards, herring, trout, tuna, salmon and mackerel) and cod liver oil.
- Fortified foods (this means they have vitamin D added to them) such as margarine, some cereals, infant formula milk.

There is little or no vitamin D in UK milk and dairy products. Only infant formula milk and margarine have statutory vitamin D supplementation in the UK.

Egg yolk, liver, and wild mushrooms contain only small quantities of vitamin D.

**Vitamin D and sunlight** Ultraviolet B (UVB) rays in sunlight convert cholesterol in the skin into vitamin D. For a fair-skinned person, it is estimated that around 20-30 minutes of sunlight on the face and forearms around the middle of the day 2-3 times a week is sufficient to make enough vitamin D in the summer months in the UK.

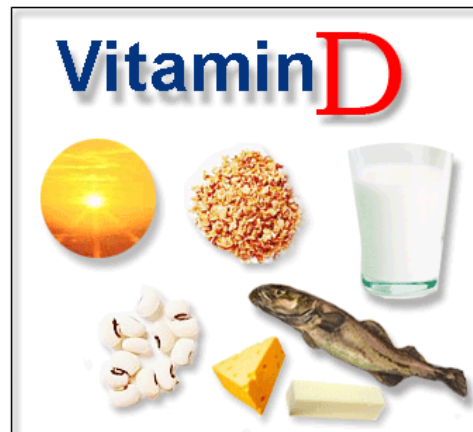
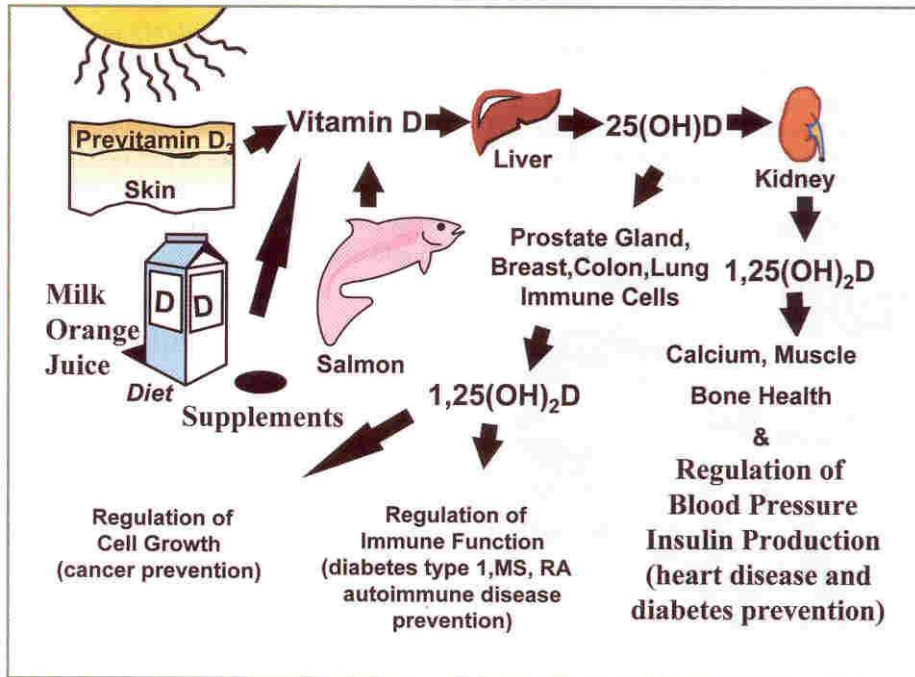
However, for people with pigmented skin and the elderly, the amount of time needed exposed to sunlight to make enough vitamin D can be much more than this. **Note:** it is not the same as sunbathing; the skin simply needs to be exposed to sunlight. But, the sunlight has to fall directly on to bare skin (through a window is not enough).

For six months of the year (October to April), much of western Europe (including 90% of the UK) lies too far north to have enough UVB rays in sunlight necessary to make vitamin D in the skin. So, many people in the UK are at risk of not getting enough vitamin D unless they get it in their diet.

**Note:** too much exposure to the sun's rays can be damaging. Sunburn should be avoided at all costs (mainly because it can increase your risk of skin cancer).

## Who gets Vitamin D deficiency

Vitamin D deficiency means that there is not enough vitamin D in your body. Broadly speaking, this can occur in three situations:



### Increased need for vitamin D

- Growing children, pregnant women, and breast-feeding women need extra vitamin D because it is required for growth.

### The body is unable to make enough vitamin D

- People who get very little sunlight on their skin are at risk of vitamin D deficiency. This is more of a problem in the most northern parts of the world where there is less sun.
- People who stay inside a lot. For example, those in hospital for a long time, or housebound people.
- People who cover up a lot of their body when outside. For example, wearing veils such as the niqab or burqa.
- People with pigmented skin (because less sunshine gets through the skin).
- Strict sunscreen use can potentially lead to vitamin D deficiency, particularly if high sun protection factor (SPF) creams (factor 15 or above) are used. Nevertheless, children especially should **always** be protected from the harmful effect of the sun's rays and should never be allowed to burn or be exposed to the strongest midday sun.
- Elderly people have thinner skin than younger people and so are unable to produce as much vitamin D. This leaves older people more at risk of vitamin D deficiency.
- Some medical conditions can affect the way the body handles vitamin D.
- Vitamin D deficiency can also occur in people taking certain medicines - examples include: carbamazepine, phenytoin, primidone, barbiturates and some anti-HIV medicines.

### Not enough dietary vitamin D

Vitamin D deficiency is more likely to occur in people who follow a strict vegetarian or vegan diet, or a non-fish-eating diet.

## Symptoms of vitamin D deficiency

### No symptoms

Many people have no symptoms, or only vague ones such as tiredness or general aches. Because symptoms of vitamin D deficiency are often very nonspecific or vague, the problem is often missed.

### Symptoms in babies and children (severe deficiency)

- Babies with severe vitamin D deficiency can get muscle spasms (cramps), seizures and breathing difficulties. These problems are related to consequent low levels of calcium.
- Children with severe deficiency may have soft skull or leg bones. Their legs may look curved (bow-legged). They may also complain of bone pains, often in the legs, and muscle pains or muscle weakness. This condition is known as rickets.
- Poor growth. Height is usually affected more than weight. Affected children might be reluctant to start walking.
- Tooth delay. Children with vitamin D deficiency may be late teething as the development of the milk teeth has been affected.
- Irritability in children can be due to vitamin D deficiency.
- Children with vitamin D deficiency are more prone to infections. Respiratory (breathing) symptoms can occur in severe cases. Breathing can be affected because of weak chest muscles and a soft ribcage.

### Symptoms in adults (severe deficiency)

- General vague aches and pains and a general sense of not being well are the common symptoms.
- In more severe deficiency (known as osteomalacia), there may be more severe pain and also weakness. Muscle weakness may cause difficulty in climbing stairs or getting up from the floor or a low chair, or can lead to the person walking with a waddling pattern.
- Bones can feel painful to moderate pressure (often more noticeable in the ribs or shin bones). Not uncommonly, people have a hairline fracture in the bone which is causing tenderness and pain. Bone pain often also occurs in the lower back, hips, pelvis, thighs and feet.

## How is Vitamin D deficiency diagnosed

It may be suspected from your medical history, symptoms, or lifestyle.

A simple blood test for vitamin D level can make the diagnosis.

Blood tests for calcium and phosphate levels and liver function may also show changes linked to a low level of vitamin D.

## Treatment for Vitamin D deficiency

The treatment is to take vitamin D supplements. This is a form of vitamin D called ergocalciferol or calciferol. Vitamin D can be given as an injection or as a medicine (liquid or tablets). Your doctor will discuss the dose and schedule, depending on your situation, age, severity of the deficiency.

### Maintenance therapy after deficiency has been treated

After vitamin D deficiency has been treated, the body's stores of vitamin D have been replenished.

After this, *maintenance* treatment is often needed long-term, to prevent further deficiency in the future.

It is likely that your risk factor for vitamin D deficiency still exists.

The dose needed for maintenance may be lower than that needed to treat the deficiency.

## The prognosis (outlook)

The outlook is usually excellent. Both the vitamin levels and the symptoms generally respond well to treatment. However, it can take time (months) for bones to recover and symptoms such as pain to get better or improve.

## Cautions with Vitamin D supplements

Care is needed with vitamin D supplements in certain situations:

- If you are taking certain other medicines: digoxin (for an irregular heartbeat - atrial fibrillation) or thiazide diuretics such as bendroflumethiazide (commonly used to treat high blood pressure). In this situation, avoid high doses of vitamin D, and digoxin will need monitoring more closely.
- If you have other medical conditions: kidney stones, some types of kidney disease, liver disease or hormonal disease. Specialist advice may be needed.
- Vitamin D should **not** be taken by people who have high calcium levels or certain types of cancer.
- You may need more than the usual dose if taking certain medicines which interfere with vitamin D. These include: carbamazepine, phenytoin, primidone, barbiturates and some medicines for the treatment of HIV infection.

Multivitamins are not suitable for long-term high-dose treatment because the vitamin A they also contain can be harmful in large amounts.

## Side-effects from vitamin D supplements

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

However, very high doses can raise calcium levels in the blood. This would cause symptoms such as thirst, passing a lot of urine, nausea or vomiting, dizziness and headaches. If you have these symptoms, you should see your GP promptly, so that your calcium level can be checked with a blood test.

## Follow-up

Most people who are treated for vitamin D deficiency will need to be reviewed a few weeks or months after starting treatment - depending on how severe their symptoms are. A further review after one year is advised.

## Useful source of information

### Patient.co.uk

Web: <http://www.patient.co.uk/health/Vitamin-D-Deficiency.htm>

Medical information for patients

Some of the information in this leaflet is extracted from this site.

### Healthy Start scheme

Web: [www.healthystart.nhs.uk](http://www.healthystart.nhs.uk)

A government-run scheme where you can get free vouchers every week, which you swap for milk, fresh fruit, fresh vegetables and infant formula milk. You can also get free vitamins. You could qualify if you receive certain benefits or if you are pregnant and aged under 18.

## NOTES

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