

Vitamin C deficiency

Vitamin C cannot be made by the human body and so is an essential component of the diet. It is needed for the health and repair of various tissues in the body, including skin, bone, teeth and cartilage.

Persistent lack of dietary vitamin C can lead to a condition called scurvy. Symptoms of scurvy include easy bruising, easy bleeding and joint and muscle pains. Vitamin C deficiency can be treated with supplements of vitamin C and a diet rich in vitamin C.

What is vitamin C?

Vitamins are a group of substances needed in small amounts by the body to maintain health. Vitamin C is also called ascorbic acid. It cannot be made by the human body and so is an essential component of your diet. Vitamin C is needed to make a substance called collagen which is required for the health and repair of various tissues in the body, including:

- Skin.
- Bone.
- Cartilage.
- Ligaments and tendons.
- Blood vessel walls.
- Teeth.

Foods rich in vitamin C

There are various foods that are rich in vitamin C, including:

- Citrus fruits like oranges, grapefruit, limes and lemons.
- Berries such as blackcurrants, strawberries, raspberries, blueberries and cranberries.

- Cantaloupe melon and watermelon.
- Kiwi fruit.
- Vegetables such as spinach, green and red peppers, tomatoes, cauliflower, cabbage, broccoli, Brussels sprouts and potatoes.

Certain foods such as cereals are fortified with vitamin C in the UK (and many other countries), which means that they have vitamin C added to them. Vitamin C is also found in fresh milk, fish and offal such as liver and kidney.

Most vitamin C in the human diet is from fruit and vegetables. Cooking fruit and vegetables reduces their vitamin C content by around a third.

The recommended daily intake of vitamin C in the diet depends on age and sex. Recommendations may vary in different countries. Pregnant and breastfeeding women also need higher amounts of vitamin C in their diet.

- Children aged 1-10 years need 30 mg of vitamin C per day.
- Children aged 11-14 years need 35 mg of vitamin C per day.
- Children over the age of 15 years and adults need 40 mg per day.

What is vitamin C deficiency?

Deficiency, or a lack, of vitamin C in your body happens because of insufficient amounts of vitamin C in your diet. Over time, a lack of vitamin C means that new collagen cannot be formed.

This causes various tissues in your body to start to break down and the health and repair of your body to become affected. Persistent (chronic) vitamin C deficiency, usually over a period of around three months or more, can lead to an illness known as scurvy.

How common is vitamin C deficiency?

Scurvy due to vitamin C deficiency is rare in the UK. It is more common in poorer countries where malnutrition is more common. There are studies to show it is increasing in the United States amongst people reliant on fast food restaurants.

There are certain groups of people who are more at risk of vitamin C deficiency. They include:

- People dependent on drugs and/or alcohol who may not have a healthy, balanced diet.
- People who go on very restrictive diets.
- People living on a low income who tend not to buy foods with a high vitamin C content.
- People with a medical condition that affects the body's ability to digest and absorb food, such as [Crohn's disease](#) and [ulcerative colitis](#).
- Older people or neuro-atypical people who may eat a less varied diet.
- [Smokers](#). Smoking affects the absorption of vitamin C from foods and also vitamin C is used up in the body more quickly in those who smoke.
- [Pregnant](#) and [breastfeeding](#) women because they need higher amounts of vitamin C.

What are the symptoms of vitamin C deficiency?

Early symptoms

The first symptoms of vitamin C deficiency tend to be:

- Tiredness and weakness.
- Muscle and joint pains.
- Easy bruising.
- Spots that look like tiny, red-blue bruises on the skin.

Other symptoms

- Dry skin.
- Splitting hair.

- Swelling and discoloration of the gums.
- Sudden and unexpected bleeding from the gums.
- [Nosebleeds](#).
- Poor healing of wounds.
- Problems fighting infections.
- Bleeding into joints, causing severe joint pains.
- Changes in the bones.
- Tooth loss.
- [Weight loss](#).

If not diagnosed and treated, vitamin C deficiency can also lead to shortness of breath, nerve problems, [high temperature \(fever\)](#) and fits (convulsions). Bleeding inside the brain and around the heart can cause death in some people with untreated vitamin C deficiency. However, this is extremely rare.

Do I need any investigations?

Vitamin C blood tests are almost never done on the NHS. Most specialists advise that they are very difficult to interpret and rarely useful. There are private providers who advise vitamin C blood tests but they are expensive and it is unlikely that they are of benefit.

People who eat a balanced diet with fruit and vegetables are unlikely to be deficient in vitamin C.

The symptoms of vitamin C deficiency are often similar to other micro-nutrient deficiencies so sometimes blood tests will be suggested to check for other deficiencies in the diet. Vitamin C is also needed for the absorption of iron from food. Therefore, iron deficiency often occurs in people who are deficient in vitamin C.

[X-rays](#) or [scans to look at your bones](#) may also be suggested because specific changes to the bones, including 'thinning' of the bones, are often seen in someone with vitamin C deficiency.

What is the treatment for vitamin C deficiency?

The treatment for vitamin C deficiency is to replace the vitamin C that is lacking in the diet. This can be achieved by taking [vitamin C supplements](#) and by eating a diet rich in vitamin C.

After a period of time, vitamin C supplements can usually be stopped. However, it is important to continue to eat a diet rich in vitamin C after the supplements are stopped. This will help to avoid becoming deficient in vitamin C again.

What is the outlook (prognosis)?

People with vitamin C deficiency usually make a full recovery. Once treatment to replace vitamin C is started, symptoms usually quickly improve within days or weeks.

How to prevent vitamin C deficiency

Vitamin C deficiency can be prevented by ensuring a healthy, balanced diet that contains plenty of fruit and vegetables, including those high in vitamin C that are listed above. As a rough guide, the amount of vitamin C needed daily by an adult is equivalent to that provided by one large orange.

Taking supplements can help if someone has a poor diet but taking too much vitamin C (more than 1000 mg a day) can be harmful, causing abdominal pains and diarrhoea.

Further reading

- [Agarwal A, Shaharyar A, Kumar A, et al](#); Scurvy in pediatric age group - A disease often forgotten? J Clin Orthop Trauma. 2015 Jun;6(2):101-7. doi: 10.1016/j.jcot.2014.12.003. Epub 2015 Jan 5.
- [Al-Dabagh A, Milliron BJ, Strowd L, et al](#); A disease of the present: scurvy in "well-nourished" patients. J Am Acad Dermatol. 2013 Nov;69(5):e246-7. doi: 10.1016/j.jaad.2013.04.051.
- [Dietary Requirements](#); British Nutrition Foundation
- [Maxfield L, Crane JS](#); Vitamin, C, Deficiency (Scurvy)

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