

# What is a mineral deficiency?

Minerals are specific kinds of nutrients that your body needs in order to function properly. A mineral deficiency occurs when your body doesn't obtain or absorb the required amount of a mineral.

The human body requires different amounts of each mineral to stay healthy. Specific needs are outlined in recommended daily allowances (RDA).

The RDA is the average amount that meets the needs of about 97 percent of healthy people. They can be obtained from food, mineral supplements, and food products that have been fortified with extra minerals.

A deficiency often happens slowly over time and can be caused by a number of reasons. An increased need for the mineral, lack of the mineral in the diet, or difficulty absorbing the mineral from food are some of the more common reasons.

# What types of mineral deficiency are there?

There are five main categories of mineral deficiency: calcium, iron, magnesium, potassium, and zinc.

## Calcium deficiency

Calcium is needed for strong bones and teeth. It also supports proper function of your blood vessels, muscles, nerves, and hormones.

Natural sources of calcium include milk, yogurt, cheese, and small fish with bones, beans, and peas. Vegetables such as broccoli, kale, and Chinese cabbage also provide calcium. Some foods are also fortified with the mineral, including tofu, cereals, and juices.

A calcium deficiency produces few obvious symptoms in the short term. That's because your body carefully regulates the amount of calcium in the blood. Lack of calcium over the long term can lead to decreased bone mineral density called osteopenia.

If left untreated, osteopenia can turn to osteoporosis. This increases the risk of bone fractures, especially in older adults.

Severe calcium deficiency is usually caused by medical problems or treatments, such as medications (like diuretics), surgery to remove the stomach, or kidney failure. Symptoms of a severe deficiency include:

- cramping of the muscles
- numbness
- tingling in the fingers
- fatigue
- poor appetite
- irregular heart rhythms

# Iron deficiency

More than half of the iron in your body is in red blood cells. Iron is an important part of hemoglobin, a protein that carries oxygen to your tissues.

Iron is also a part of other proteins and enzymes that keep your body healthy. The best sources of iron are meat, poultry, or fish. Plant-based foods such as beans or lentils are also good sources.

Iron deficiency develops slowly and can cause anemia. It's considered uncommon in the United States and in people with healthy diets. But, the World Health Organization estimated in a 2008 report that iron deficiency causes approximately half of all anemia cases worldwide.

The symptoms of iron-deficiency anemia include feeling weak and tired. You may be performing poorly at work or school. Children may exhibit signs through slow social and cognitive development.

# Magnesium deficiency

The body needs magnesium for hundreds of chemical reactions. These include responses that control blood glucose levels and blood pressure. Proper function of muscles and nerves, brain function, energy metabolism, and protein production are also controlled by magnesium.

Roughly 60 percent of the body's magnesium resides in the bones while nearly 40 percent resides in muscle and soft tissue cells. Good sources of magnesium include:

- legumes
- nuts
- seeds
- whole grains
- green leafy vegetables, such as spinach

**Magnesium deficiency** is uncommon in healthy people. The kidneys can keep magnesium from leaving the body through the urine. Still, certain medications and chronic health conditions like alcoholism may cause magnesium deficiency.

Magnesium needs are also highly influenced by the presence of disease. In this situation, the RDA for magnesium may not be sufficient for some individuals.

Early signs of magnesium deficiency include:

- fatigue
- weakness
- loss of appetite
- nausea
- vomiting

Magnesium deficiency can lead to the following symptoms if left untreated:

- numbness
- tingling
- muscle cramps
- seizures
- abnormal rhythms of the heart

# Potassium deficiency

Potassium is a mineral that functions as an electrolyte. It's required for muscle contraction, proper heart function, and the transmission of nerve signals. It's also needed by a few enzymes, including one that helps your body turn carbohydrates into energy.

The best sources of potassium are fruits and vegetables, such as bananas, avocado, dark leafy greens, beets, potatoes, and plums. Other good sources include orange juice and nuts.



The most common cause of potassium deficiency is excessive fluid loss. Examples can include extended vomiting, kidney disease, or the use of certain medications such as diuretics.

Symptoms of potassium deficiency include muscle cramping and weakness. Other symptoms show up as constipation, bloating, or abdominal pain caused by paralysis of the intestines.

Severe potassium deficiency can cause paralysis of the muscles or irregular heart rhythms that may lead to death.

# Zinc deficiency

Zinc plays a role in many aspects of the body's metabolism. These include:

- protein synthesis
- immune system function
- wound healing
- DNA synthesis

It's also important for proper growth and development during pregnancy, childhood, and adolescence. Zinc is found in animal products like oysters, red meat, and poultry. Other good sources of zinc include:

- beans
- nuts
- whole grains
- dairy products

Zinc deficiency can cause loss of appetite, taste, or smell. Decreased function of the immune system and slowed growth are other symptoms.



Difficulty with digestion of food or absorption of nutrients can result in mineral deficiency. Potential causes of these difficulties include:

- diseases of the liver, gallbladder, intestine, pancreas, or kidney
- surgery of the digestive tract
- chronic alcoholism
- medications such as antacids, antibiotics, laxatives, and diuretics

Mineral deficiency can also result from an increased need for certain minerals. Women, for instance, may encounter this need during pregnancy, heavy menstruation, and post menopause.

# What are the symptoms of mineral deficiency?

The symptoms of a mineral deficiency depend upon which nutrient the body lacks. Possible symptoms include:

- constipation, bloating, or abdominal pain
- decreased immune system
- diarrhea
- irregular heart beat
- loss of appetite
- muscle cramping
- nausea and vomiting
- numbness or tingling in the extremities
- poor concentration
- slow social or mental development in children
- weakness or tiredness

# How is a mineral deficiency treated?

The treatment for a mineral deficiency depends upon the type and the severity of the deficiency. Underlying conditions are also a factor.

Your doctor may order further tests to identify the amount of damage before deciding on a treatment plan. This can include treatment for other diseases or a change in medication.

## **Dietary changes**

A change in eating habits may help if you have a minor mineral deficiency. People with anemia due to a lack of iron in the diet, may be asked to eat more meat, poultry, eggs, and iron-fortified cereals.

You may be referred to a registered dietitian if your deficiency is more severe. They'll help you modify your eating habits. This will include guidelines on how to eat a well-balanced diet rich in fruits, vegetables, and whole grains.

The dietitian may also ask you to keep a food diary to track what foods you're eating and your progress.

# Supplements

Certain mineral deficiencies cannot be treated with diet alone. You may be required to take a [multivitamin](#) or mineral supplement.

These may be taken alone or with other supplements that help the body absorb or use the mineral. [Vitamin D](#), for example, is usually taken along with calcium.

Your healthcare provider will decide how much and how often you should take supplements. It's important to follow your provider's instructions because excessive intake of certain supplements can be harmful.

## **Emergency treatment**

Hospitalization may be required in very severe cases of mineral deficiency. Minerals and other nutrients can be administered intravenously.

Treatment may be required one or more times a day for several days. This type of treatment can have side effects including fever or chills, swelling of the hands or feet, or changes in heartbeat.

Your healthcare provider will administer additional blood tests to determine whether treatment was successful.



# Phosphorus Deficiency



Medically reviewed by Dena Westphalen, Pharm.D. — By Ashley Marcin — Updated on March 13, 2018

[Symptoms](#) | [Causes](#) | [Diagnosis](#) | [Treatment](#) | [Complications](#) | [Foods](#) | [Outlook](#)

## Overview

Phosphorus is a mineral that's found in the bones and processed by the kidneys. In fact, **85 percent** of the phosphorus found in the body resides in the bones and teeth.

While calcium often gets the spotlight for protecting bone health, phosphorus is just as important. The mineral also exists in smaller amounts in cells and other tissues for growth and repair. It's part of a bigger picture — a balance of other vitamins and minerals in the body, like vitamin D, [iodine](#), [magnesium](#), and zinc.

A phosphorus deficiency is [uncommon](#). It happens when the body has low levels of this vital mineral. Poor diets or eating disorders may contribute to a deficiency. Other medical conditions or situations that cause levels to fall include [diabetes](#), inherited disorders, and alcoholism.

# What are the symptoms?

You may experience a number of bone-related symptoms if you have a phosphorus deficiency. For example, you may have bone pain or fragile bones that break more easily. Loss of appetite is another symptom that may make it difficult to boost your phosphorus levels through a healthy diet.

Other symptoms include:

- anxiety
- fatigue
- irregular breathing
- irritability
- joint stiffness
- numbness
- weakness
- changes in body weight

In addition, children who don't have enough phosphorus in their bodies may experience poor growth patterns or issues with bone and tooth development.

# Common causes

You gain phosphorus through the foods you eat. If you don't have an adequate diet or have conditions that affect your ability to store and use this mineral, you may develop a phosphorus deficiency (hypophosphatemia).

## Starvation


Phosphorus deficiency is **rare**. Even when people don't get enough of this mineral in their diets, the body can compensate by reabsorbing what's already in the bloodstream. That said, severe starvation cases can result in hypophosphatemia.

If you are **deficient** in other vitamins — like **vitamin D** — you may also have more trouble absorbing phosphorus and other minerals, like calcium, because of how they work together.

## Diabetes

Diabetes can also lead to a deficiency, especially for people recovering from an episode of [diabetic ketoacidosis](#). This means that the body isn't producing enough insulin and can't break fat down as fuel. As a result, acids build up in the blood, which can cause a phosphorus deficiency.

## Alcoholism

Alcoholism may lead to malnutrition as well. As a result, people with alcoholism may develop nutritional deficiencies, including hypophosphatemia. Deficiency may be [particularly](#)  likely in people who are hospitalized due to alcohol abuse.

## Anorexia

Individuals who are in treatment for [eating disorders](#) like [anorexia](#) may be on refeeding treatments. If these treatments are high in calories but too low in phosphorus, a deficiency may arise.

## **Inherited disorders**

There are also certain genetic disorders that affect the body's ability to store phosphorus. These disorders are often the result of excreting too much phosphorus in the urine or not absorbing the mineral from foods.

# Complications of a long-term deficiency

Without treatment, low phosphorus levels may lead to complications, especially if there is also a calcium imbalance. If the deficiency is severe enough, it may become life-threatening. If you're experiencing signs of deficiency, seek medical help.

## Rickets

This [disease](#) is [more common](#) in children. It's also related to vitamin D deficiency, which inhibits the body's ability to absorb both calcium and phosphorus. Symptoms include delayed growth, spinal pain, muscle weakness, and skeletal deformities.

# Treatment options

Most people don't need to supplement their phosphorus. Usually, foods give the body enough of this mineral. That said, if you suspect you have a deficiency, contact your doctor. You may have an underlying condition that affects your ability to store phosphorus. Treatment of the condition and eating a healthy diet may help get your levels back to normal.



Some people also need supplementation to get their levels back on track. Supplements should only be taken under medical supervision, as a surplus of phosphorus can also have health implications. How much you

# Foods rich in phosphorus

If you're looking to boost your levels without supplements, you can focus on foods rich in phosphorus. However, not all phosphorus-rich foods are part of a healthy diet. Most processed foods do contain high amounts of this mineral, for example. Work with a dietician if you're in need of more phosphorus in your diet.

## Beverages

- beer
- cocoa or chocolate drinks
- dark colas
- drinks made with milk
- canned iced teas
- milk

# Dairy

- cheese
- liquid nondairy creamers
- custard and pudding
- ice cream
- yogurt
- cream soups

# Protein

- oysters
- sardines
- fish roe
- eggs
- nuts and legumes
- beef liver
- salmon
- chicken liver
- other organ meats

# Other foods and prepared foods

- chocolate candies
- caramel candies
- most processed foods
- oat bran muffins
- pizza
- brewer's yeast
- whole grains
- hard potatoes
- dried fruits
- garlic cloves