



## **Education**

### **Anemia**

#### **What is anemia?**

Anemia is a blood disorder that is defined as:

- having fewer red blood cells (RBCs) than normal, or
- having less hemoglobin than normal (hemoglobin is the part of red blood cells that carries oxygen).

When there are not enough red blood cells or there is too little hemoglobin, the blood is not able to carry enough oxygen to all parts of the body.

There are several different kinds of anemia, such as:

- iron deficiency anemia
- hemolytic anemia
- vitamin B-12 deficiency anemia
- folic acid deficiency anemia
- anemia caused by inherited abnormalities of RBCs (for example, sickle cell anemia and thalassemia)
- anemia caused by chronic (ongoing) disease, such as rheumatoid arthritis.

#### **How do the different forms of anemia occur?**

##### **Iron deficiency anemia:**

This most common form of anemia results from not having enough iron in the blood. Iron is a mineral that is important to all body cells. It is particularly important for blood cells because iron is needed to make hemoglobin. Iron deficiency anemia may be caused by a lack of iron in the diet or a loss of blood.

##### **Hemolytic anemia:**

This kind of anemia occurs when red blood cells are destroyed or damaged by infection, drugs, or inherited conditions.

##### **Vitamin B-12 (cobalamin) deficiency anemia:**

This type of anemia results when the stomach or intestines have trouble absorbing vitamin B-12. For example, an immune system disorder called pernicious anemia prevents normal absorption of the vitamin by the intestinal tract. Stomach or intestinal illness, some medicines, and some inherited disorders may also cause vitamin B-12 deficiency. Some vegetarians may not get enough vitamin B-12 from the foods they eat.

Besides causing anemia, a lack of vitamin B-12 affects the nervous system and may cause symptoms of numbness, tingling, balance problems, depression, or memory problems.

##### **Folic acid deficiency anemia:**

Anemia due to a lack of folic acid in the diet is similar to B-12 deficiency anemia, but there is no damage to specific nerves. However, it can cause depression. Not enough folic acid in a woman's diet at the time she becomes

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pregnant or during early pregnancy can cause birth defects. This type of anemia is common in:

- pregnant women
- people whose intestines have problems absorbing nutrients from food
- people using some daily medicines, such as phenytoin, sulfasalazine, and possibly birth control pills
- alcoholics, who often suffer from malnutrition.

### **Anemia caused by inherited problems with red blood cells:**

The most common types of inherited problems that cause anemia because the red blood cells are abnormal are sickle cell anemia and thalassemia.

**Sickle cell anemia** is an inherited disease that causes abnormal, sickle-shaped red blood cells. Sickle cell disease is most prevalent among people who are African, African American, Mediterranean (Italian or Greek), Middle Eastern, East Indian, Caribbean, and Central or South American. The abnormal RBCs are damaged or destroyed as they pass through the circulatory system. The anemia causes many symptoms. It can cause a condition called sickle cell crisis. The crisis may occur under certain conditions such as altitude or pressure changes, low oxygen, or some illnesses. In sickle cell crisis the RBCs become even more deformed and block tiny blood vessels, causing severe, prolonged pain and other complications.

**Thalassemias** are a group of inherited anemias caused by abnormal hemoglobin. The abnormal hemoglobin may cause abnormal red blood cells as well as low hemoglobin levels. Thalassemias most commonly affect people of Mediterranean descent, but some types also affect peoples of Africa, Asia, India, and the South Pacific. Most forms of thalassemia are mild, but some forms cause life-threatening disease in children.

### **Anemia caused by disease:**

Some of the ongoing (chronic) diseases that may cause anemia are:

- cancer
- rheumatoid arthritis
- ongoing infections
- kidney disease.

### **What are the symptoms?**

Mild anemia usually does not produce symptoms.

More severe anemia is associated with:

- weakness
- fatigue
- skin, gums, and nail beds that are pale.

Other symptoms of worsening anemia include:

- lightheadedness, especially when you change positions, for example, when you stand up
- fast heartbeat
- shortness of breath
- fainting
- chest pain.

Jaundice (yellow skin and eyes) may be a symptom of hemolytic anemia.

### **How is it diagnosed?**

Your health care provider will carefully review your symptoms and examine you. You will have a complete blood count (CBC) to confirm anemia and to see how severe it is. You may need other tests to determine the type of anemia.

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## **How is it treated?**

The treatment depends on the type of anemia you have. You will have follow-up visits with your health care provider to check your blood count and the effect of your treatment.

### **Iron deficiency anemia:**

To treat iron deficiency anemia (if there is no underlying disease causing blood loss), your health care provider may simply prescribe iron supplements and/or a diet of foods rich in iron.

### **Vitamin B-12 deficiency anemia:**

If you have this form of anemia because your stomach does not absorb vitamin B-12 well, the usual treatment is a shot of vitamin B-12 once a month. In some cases your health care provider may prescribe an oral tablet.

### **Folic acid deficiency anemia:**

The treatment for folic acid deficiency anemia is daily oral folate tablets. This anemia is similar to vitamin B-12 deficiency anemia. You should not start taking folate supplements until your health care provider has made sure you do not have vitamin B-12 deficiency anemia.

### **Anemia caused by inherited abnormalities of RBCs:**

Sickle cell anemia usually requires frequent treatments. Sickle cell crisis requires IV (intravenous) fluids, rest, pain relief, and sometimes a blood transfusion.

The treatment for thalassemia depends on such factors as the severity of the anemia, your age, and the risk of blood transfusions. When blood transfusions are needed for acute anemia, there is a very small risk that you will get a blood-borne disease such as hepatitis or AIDS, even though donated blood is carefully screened. For this reason, your health care provider will recommend a transfusion only when it is clearly the best treatment for you. People who have thalassemia must **not** take iron tablets.

### **Anemia caused by chronic disease:**

Fortunately, the effects of this type of anemia usually tend to be mild. For certain conditions, such as chronic kidney disease, your health care provider may prescribe regular shots of erythropoietin. These shots cause your body to make more red blood cells.

## **How long will the effects last?**

The symptoms of mild, easily treated anemias, such as iron deficiency anemia, respond quickly to treatment and improve in just a few days.

The symptoms of chronic anemias, such as sickle cell anemia, come and go. Anemia associated with a chronic disease usually improves or worsens as the disease improves or worsens.

## **How can I take care of myself?**

Follow your health care provider's instructions. Take your medicine as prescribed.

## **What can I do to help prevent anemia and problems it causes?**

The prevention of anemia depends on the cause. If your anemia is caused by a deficiency in your diet, eating foods rich in the missing nutrient will help to prevent a recurrence.

To prevent the complications of vitamin B-12 deficiency anemia, follow your health care provider's treatment of vitamin B-12 injections.

If you have sickle cell disease, it is important not to get dehydrated (that is, not to lose too much body fluid) during hot weather, exercise, or illness. Dehydration can trigger a sickle cell crisis.

Genetic counseling is important for families with inherited anemia.

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