

Anemia

Introduction

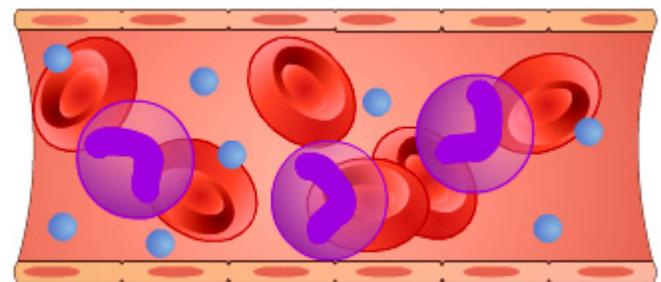
Anemia happens when a person doesn't have enough red blood cells. When you don't have enough red blood cells, your blood can't carry enough oxygen to your body.

About 30% of the world's population is anemic. Most cases of anemia are mild and easily treated. But severe or long-lasting anemia can damage the heart, brain and other organs of the body. It may even cause death.

This reference summary will help you understand anemia, including its symptoms and causes. It will also discuss risk factors, treatment and prevention.

Blood

Anemia is a disease of the blood. Blood helps distribute the nutrients, oxygen and hormones the body needs. It also carries toxins and waste materials to the liver and kidneys to be removed from the body.



Blood

Hormones are chemicals made by glands in the body. Hormones circulate in the bloodstream and control the actions of certain cells or organs. Some hormones can also be made in the laboratory.

Blood is made of blood cells floating in plasma. Plasma is mostly made of water with chemicals in it. These chemicals include cholesterol, proteins, hormones, minerals, vitamins and a type of sugar called glucose.

There are three basic types of blood cells: red blood cells, white blood cells and platelets.

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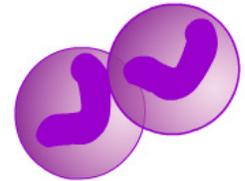
Red blood cells, or RBCs, are also called erythrocytes. They make up almost half of the blood. Red blood cells are disc-shaped and look like doughnuts without holes in the center.



Red Blood Cells

Red blood cells are filled with hemoglobin. Hemoglobin is a protein that picks up oxygen in the lungs and delivers it to cells all around the body. Hemoglobin also picks up carbon dioxide, or CO₂, from the cells to be breathed out from the lungs.

White blood cells, or WBCs, are also called leukocytes. They fight disease and infection by attacking and killing germs that get into the body. There are several types of white blood cells. Each type fights different kinds of germs in different ways.



White Blood Cells

Platelets are also called thrombocytes. They are small pieces of cell that help blood clot and stop bleeding.



Platelets

Blood cells are made in the bone marrow. The bone marrow is a spongy tissue located inside some bones. It contains young parent cells called stem cells. Stem cells can grow into all 3 types of blood cells. Not having enough of one type of blood cell is called a low blood count. Health care providers also call this a cytopenia.

A low red blood cell count is called anemia. With some types of anemia, you may have low numbers of all three types of blood cells. Anemia can also happen if your red blood cells don't contain enough hemoglobin or if the hemoglobin is defective.

Symptoms

The most common symptom of anemia is feeling tired or weak. Other symptoms may include:

- Shortness of breath.
- Pale skin.
- Lightheadedness.
- Chest pain.
- Feeling the heart beat.
- Headache.
- Ringing or humming in the ears.
- Increased sleepiness.
- Coldness in the hands and feet.



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The more severe the anemia and the more quickly it develops, the worse the symptoms tend to be. Many other problems can cause these symptoms, so health care providers must perform tests to find out if the symptoms are related to anemia. If you have symptoms of anemia, see your health care provider to find out whether you are suffering from that condition.

Complications

Anemia can cause complications if left untreated. This is why it is important to talk with your health care provider if you have the symptoms of anemia. Complications of anemia are caused by the heart needing to work harder to pump oxygen-rich blood through your body.

Anemia can cause arrhythmias. An arrhythmia is a problem with the rate or rhythm of the heartbeat. Over time, arrhythmias can damage your heart and possibly lead to heart failure.

Anemia makes it harder for your body to get blood and oxygen to other organs in your body. This can damage the other organs. Anemia can weaken people who have cancer or HIV or AIDS. This can make their treatments not work as well.



Anemia can also cause many other health problems.

Sometimes other health conditions can increase the likelihood of complications. For example, people who have kidney disease and anemia are more likely to have heart problems.

Causes

Anemia can be caused by one or more of the following causes:

- Blood loss.
- Lack of red blood cell production.
- High rates of blood cell destruction.

Blood loss and iron deficiency are the common causes of anemia. Iron-deficiency anemia is a condition that happens if you don't have enough iron in your body. The body needs iron to make hemoglobin.



The body may not make enough red blood cells for many reasons. In some cases, a genetic condition inherited from the parents may be the reason.

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Examples of non-genetic or acquired conditions that can prevent your body from making enough red blood cells include poor nutrition, imbalances in hormones, some chronic diseases and pregnancy. The following sections will look more closely at each of these.

A diet that lacks iron, folic acid or vitamin B12 can prevent your body from making enough red blood cells. Your body also needs small amounts of vitamin C, riboflavin and copper to make red blood cells. Certain conditions can also make it hard for your body to absorb these nutrients.

Anemia can also happen during pregnancy due to low levels of iron and folic acid. Also, during the first 6 months of pregnancy, plasma increases faster than the number of red blood cells. This dilutes the blood and can lead to anemia.

Your body needs the hormone erythropoietin to make red blood cells. Erythropoietin stimulates the bone marrow to make these cells. A low level of this hormone can lead to anemia. Chronic diseases, like kidney disease and cancer, can make it hard for your body to make enough red blood cells.

Some infants are born without the ability to make enough red blood cells. This condition is called aplastic anemia. Other people can get aplastic anemia from certain medicines, toxins and infectious diseases.

Anemia can also be caused by acquired or inherited conditions that cause your body to destroy too many red blood cells. An acquired condition that can do this is an enlarged or diseased spleen. The spleen is an organ that removes worn out blood cells from the body. If the spleen is enlarged or diseased, it may remove too many blood cells.



Some cancer treatments may affect the bone marrow or the red blood cells' ability to carry oxygen. If bone marrow is damaged, it can't make red blood cells fast enough to replace the ones that died or were destroyed.

Also, people with HIV/AIDS may develop anemia due to infections or medicines used to treat their diseases.

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Inherited conditions that destroy too many red blood cells include sickle cell anemia, thalassemias and a lack of certain enzymes. Sickle cell anemia is a serious disorder in which the body makes crescent-shaped red blood cells. These abnormal red blood cells are called sickle cells. Sickle cells are stiff and sticky and can easily block blood flow. Thalassemias are inherited blood disorders. They cause the body to make fewer healthy red blood cells and less hemoglobin than normal.

Risk Factors

Anemia is a common condition. People in all age, racial and ethnic groups can get anemia. But there are certain risk factors that increase the chances of getting anemia.

Women of childbearing age are at a higher risk for anemia. This is because women in this age range lose blood from menstruation. Anemia can also happen during pregnancy.

Patients who have lost a lot of blood during a surgical operation or because of an injury can develop anemia.

Some babies are also at risk for anemia due to iron deficiency. Premature infants or infants who are only fed breast milk or formula that isn't fortified with iron can develop iron-deficiency anemia.

Infants between 1 and 2 years of age are also at risk of anemia. They may not get enough iron in their diets, especially if they drink a lot of cow's milk. Cow's milk is low in iron and can prevent the body from absorbing iron from iron-rich foods.

Teenagers are at increased risk of anemia. Growth spurts during these years puts them at higher risk of iron-deficiency anemia.

Researchers continue to study how anemia affects older adults. More than 10% of older adults have mild forms of anemia. Many of these people have other medical conditions as well.



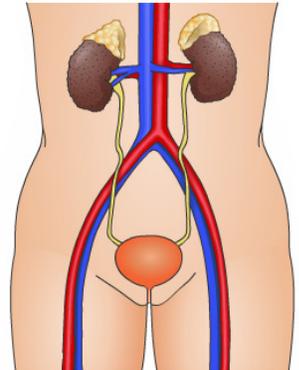
A person with long-term or serious illnesses is also at a higher risk of anemia. These illnesses include:

- Cancer.
- Diabetes.
- Heart failure.
- HIV/AIDS.
- Inflammatory bowel disease.
- Kidney disease.
- Liver disease.
- Rheumatoid arthritis.
- Thyroid disease.



Other risk factors include:

- A diet low in iron, vitamins or minerals.
- A family history of inherited anemia.
- Blood loss from surgery or an injury.
- Long-term infections.



Diagnosis

When diagnosing anemia, your health care provider will ask about any symptoms you may have. They will also ask about the medicines you take, your diet and whether you have a family history of anemia.

Your health care provider will do a physical exam and may run some blood tests to help diagnose anemia.

If your health care provider thinks you have anemia due to internal bleeding, he or she may suggest other tests to look for the source of the bleeding.

Your health care provider may also want to do bone marrow tests. These tests show whether your bone marrow is healthy and making enough blood cells.

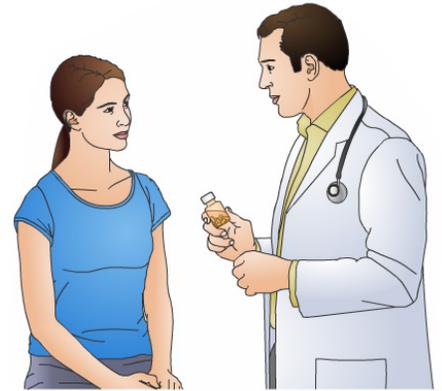


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Treatment

Treatment of anemia depends on the type, cause, and the severity of the anemia. Treatments may include dietary changes or supplements, medicines or procedures.

Low levels of vitamins or iron in the body can cause some types of anemia. Your health care provider may recommend that you include more iron-rich foods in your diet.



Your health care provider may also suggest supplements.

Iron supplements are a good way to take in more iron. Other common supplements that may be suggested are vitamin B12, folic acid, and vitamin C.

- Iron is needed by the body to make hemoglobin.
- Low levels of vitamin B12 can lead to pernicious anemia, a specific type of anemia. Vitamin B12 is needed by the body to make healthy red blood cells.
- Folic acid is needed by the body to make and maintain new cells. It can help pregnant women avoid anemia.
- Vitamin C helps the body absorb iron.

Your health care provider may prescribe medicines to increase the number of red blood cells your body makes. Medicines can also treat an underlying cause of anemia.

Medical procedures may be needed to treat severe anemia. These procedures can include blood transfusion, blood and marrow stem cell transplant, or surgery. A blood transfusion is a safe, common procedure in which blood is given to you through an intravenous line in one of your blood vessels.

A blood and bone marrow stem cell transplant replaces your damaged stem cells with healthy ones from another person. Stem cells are found in the bone marrow. They develop into red and white blood cells and platelets.

If you have serious or life-threatening bleeding that's causing anemia, you may need surgery. Surgery can be used to control ongoing bleeding. It may also be needed to remove the spleen if your body is destroying red blood cells at a high rate in your enlarged spleen.

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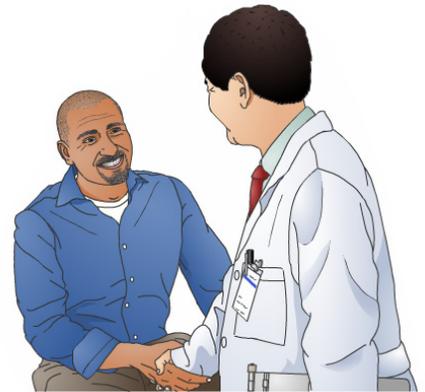
Summary

A low red blood cell count is called anemia. When you do not have enough red blood cells, your blood cannot carry enough oxygen to your body. It is estimated that about 30% of the world's population is anemic.

Anemia has three main causes: blood loss, lack of red blood cell production or high rates of blood cell destruction. These causes may be due to many diseases, conditions or other factors.

The more severe the anemia and the more quickly it develops, the worse the symptoms tend to be. If you have symptoms of anemia, see your health care provider to find out whether you have the condition.

Severe or long-lasting anemia can damage the heart, brain, and other organs of the body. It may even cause death. But most cases of anemia are mild and easily treated by including more iron-rich foods in your diet or by iron supplements.



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