

Anemia

Reviewed by SickKids Staff | Last updated: March 5th 2010

An overview of the causes, symptoms and treatment of the blood disorder anemia.

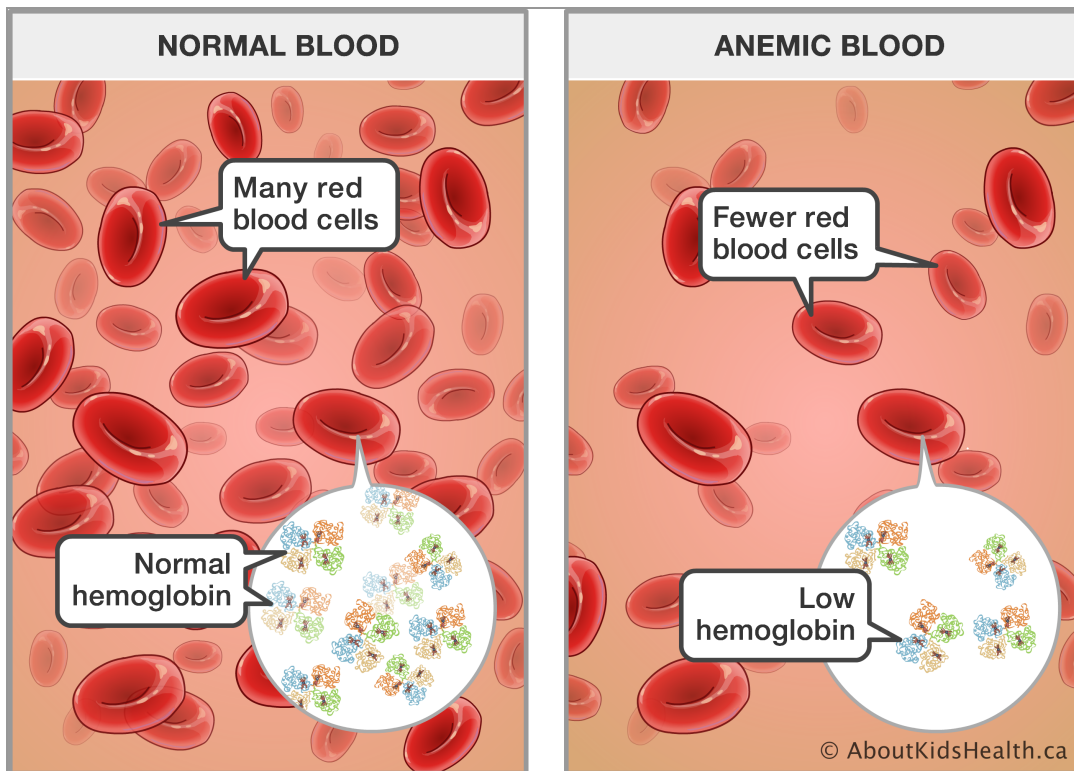
Key points

- Most commonly, anemia is caused by not enough iron in the blood.
- If your child is often tired, weak and pale, see your doctor about anemia.
- Infant formulas should be enriched with iron if your baby is not yet eating solid foods.
- Offer your child foods that are rich in iron, including meat and green vegetables.

What is anemia?

Anemia is a lack of either hemoglobin or red blood cells in the body. Hemoglobin (say: HE-mo-globe-in) is the iron-rich protein in red blood cells (RBCs) that allows transport of oxygen to the tissues.

Anemia occurs when the amount of hemoglobin in a person's blood is too low. This means there is not enough delivery of oxygen to the body. This can cause paleness, tiredness or fatigue, and weakness.



In normal blood, there are lots of red blood cells. These cells contain a normal type and amount of hemoglobin molecules which work to deliver oxygen to the body. In a person with anemia there are fewer red blood cells or there is less or abnormal hemoglobin in the red blood cells. This can result in less oxygen being delivered to various body tissues.

Anemia can last a short time or a long time. In mild cases, treatment is a simple change in diet. More severe cases need medical treatments.

Signs and symptoms of anemia

Symptoms depend upon the severity of the anemia, how fast the drop occurred, and its cause. It also depends on how well a child's body adapts to a low level of hemoglobin. Symptoms may include:

- Pale skin, because hemoglobin causes blood to be red coloured.
- Lack of energy, because of reduced oxygen in the body.
- Shortness of breath after exercise or play, due to lack of oxygen in the body.

Causes and types of anemia

There are several types of anemia. In general, they are classified by cause.

Nutritional anemias

Iron deficiency anemia is the most common type of anemia. It is caused by a lack of iron in the diet. Iron is needed to make hemoglobin. Infants fed only breast milk, non-iron fortified cow milk formulas, or whole cow's milk may be at risk for iron deficiency after six months of age. Infant formulas should be enriched with iron if your baby is not yet eating solid foods.

Healthy mothers delivering full-term babies have sufficient stores of iron for their babies until six months when other solid feeds high in iron content are recommended. The iron in breast milk is well absorbed. Breastfeeding is recommended with the introduction of solid foods at some point between six months and two years of age. It is not the exclusive breastfeeding but not introducing solids high in iron at the recommended time, which is the concern for developing anemia.

Vitamin deficiency anemia is a lack of folic acid, vitamin B12 or vitamin E in the diet. The body needs all these nutrients to make hemoglobin.

Anemias cause by disease

Sickle cell anemia is an inherited disease that causes RBCs to be an abnormal shape. These cells cannot flow through the body as well as normal RBCs. This can lead to less delivery of oxygen to the body.

Anemias of chronic disease can be caused by kidney failure, cancer and Crohn's disease. Anemia may also be caused by bone marrow disease and autoimmune diseases such as lupus.

Aplastic anemia is a rare and serious disease causing the body to stop making enough new blood cells. A child may be born with this anemia or develop it after a viral infection or exposure to a drug. Sometimes, it is an early sign of leukaemia.

Hemolytic anemias are usually a genetic disease causing the abnormal destruction of too many RBCs.

Other causes of anemia

- Anemia caused by bleeding, either acute or chronic. Anemia from chronic blood loss is most common in the gastrointestinal tract. This is often caused by a cow's milk protein allergy.
- Low levels of thyroid hormone or testosterone.
- As a side effects of certain medications.

Risk factors for anemia

There are some groups of children that have a higher risk of developing anemia. Factors that may cause a higher risk include:

- prematurity and low birth weight
- recent immigration from the developing world
- poverty
- obesity or poor eating habits
- excessive consumption of cow's milk
- bottle feeding beyond 18 months of age

What your child's doctor can do about anemia

Your child's doctor will conduct a simple blood test that will show the amount of hemoglobin in your child's blood. The number, size, and shape of the RBCs will show the type of anemia. Hemoglobin can be measured quickly with a few drops of blood. The amount of RBCs compared to the total blood volume will also be measured. This test is known as the hematocrit.

Your child's doctor will also do a physical exam and ask about your child's energy levels, general health, diet, and family history.

Treatment of anemia

Treatment depends on how severe your child's anemia is and what is causing it. Common treatments include:

- Iron containing medicines and supplements.
- Infant iron-rich formula.
- Dietary changes, such as reducing milk and increasing iron. Iron rich foods include including meat and green vegetables. A child who does not eat meat should eat plenty of green vegetables like kale, spinach, collard greens, and artichokes.
- Folic acid and vitamin B12 supplements.

Anemia caused by a more serious disease may require:

- Blood transfusions for certain types of anemia. These include hypoplastic anemia, thalassaemia, and hemoglobinopathies. Frequent blood transfusions can cause a build-up of iron in the body that has toxic effects. Your child may be given drugs that remove iron from the body along with the transfusions.
- Treatment with medicines to fight infection.

- Treatment to make the bone marrow produce more blood cells.
- Removal of the spleen. Some conditions, such as congenital spherocytosis and congenital elliptocytosis, cause the spleen to destroy too many red blood cells.
- A bone marrow transplant may be a treatment option in severe cases of sickle cell anemia, thalassemia, and aplastic anemia.

Long term effects of anemia

Untreated anemia in children can have a serious effect on a child's growth. Anemia may affect mental development and function. This often leads to attention problems, delays in reading ability, poor school performance and in very rare cases - stroke.

When to seek medical assistance

Call your child's regular doctor if:

- Your child is often very pale, tired and short of breath.
- You suspect your child may have anemia.

Please visit [AboutKidsHealth.ca](https://www.aboutkidshealth.ca) for more child health information.

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