



# Blood Management Institute

Cooperman Barnabas  
Medical Center | **RWJBarnabas**  
HEALTH

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**To contact the Blood Management Institute at  
Cooperman Barnabas Medical Center, please call 973-322-2950.**

# Anemia

Anemia is a condition in which there are less red blood cells or hemoglobin in your blood than normal. Hemoglobin is the part of red blood cells that carries oxygen to the tissues of the body. Anemia results in not enough oxygen reaching these tissues.

## Symptoms

Symptoms may occur suddenly or they may develop slowly. They include:

- Fatigue
- Weakness
- Dizziness
- Headache
- Low body temperature
- Pale skin
- Rapid or irregular heartbeat
- Shortness of breath or chest pain, especially with physical activity

## Causes

Common causes of anemia include:

- Excessive bleeding
  - » Bleeding may be internal or external. This includes bleeding from heavy periods or from the ulcers or colon polyps.
- Poor nutrition
  - » Nutrients such as iron, vitamin b12 and folate are needed to make red blood cells. A poor diet can lead to decreased red cell production.
- Chronic diseases
  - » Kidney, thyroid, and liver disease
  - » Cancer
  - » HIV, AIDS
- Blood disorders
- Bone marrow disorders that decrease red blood cell production
- Spleen problems that increase red blood cell destruction
- Excess destruction of red blood cells due to infection, medicines, and autoimmune disorders

## Diagnosis

Additional blood tests are often needed. These help your health care provider determine the best treatment.

## Treatment

Treatment varies depending on the cause of anemia. Treatment can include:

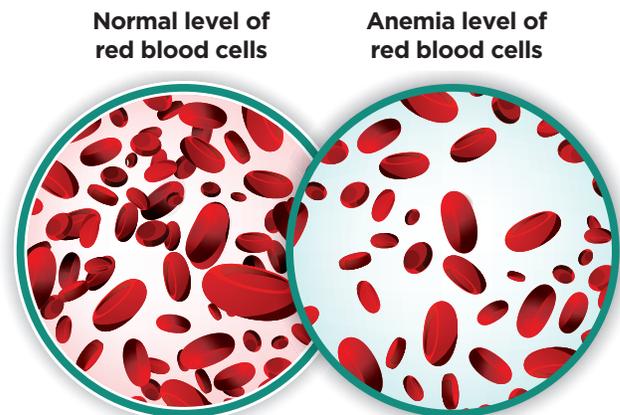
- Supplements of iron, vitamin B12 or folic acid
- Erythropoietin stimulating agents (ESAs)
- Blood transfusion
- Dietary changes
- Hospitalization may be needed if there is significant continual blood loss

## Anemia and Surgery

Preoperative anemia is associated with poor outcomes such as slower recovery. Anemia is also associated with increased risk of blood transfusion. For better outcomes, it is best to correct, if possible, anemia before surgery.

## Anemia and Pregnancy

Untreated anemia during pregnancy can lead to complications such as prematurity, spontaneous abortions, low birth weight and postpartum depression. Anemia is also associated with increased risk of blood transfusions, whether delivering vaginally or via caesarian section. It is recommended that anemia be treated prior to delivery for best outcomes.





## Treatment of Anemia

### Iron

Iron is a mineral in the body that directly affects hemoglobin. Hemoglobin is a protein that helps blood carry oxygen to your organs.

Without enough iron, your body will be unable to make the hemoglobin you need to function at your physical best.

### Intravenous Iron Therapy

Intravenous (IV) iron therapy is an iron infusion in which iron is delivered directly into the bloodstream through the use of an IV catheter.

Side effects are rare, but can include:

- Itchiness
- Rash
- Flushing
- Muscle and joint pain
- Fever
- Chest pain
- Inflammation at injection site
- Anaphylaxis\*

*\*Less than 1 % experience anaphylaxis reaction.*

**Inform clinical staff immediately if you experience any of these symptoms.**

### Preparing for IV Iron Therapy

- Stop oral iron
- No fasting required

### Iron Infusion Therapy and Pregnancy

IV iron therapy during pregnancy is completely safe. Treatment is given at lower doses on a more frequent basis to ensure the safety of the mother and baby.

## Iron-Rich Foods

Eating iron rich foods along with IV iron therapy can be very beneficial.

Foods that are excellent sources of iron:

- Green vegetables (spinach, kale, chard, broccoli, peas)
- Dried fruits (apricots, prunes, raisins, peaches, dates)
- Legumes (lentils, chickpeas, soybeans)
- Liver and other organ meat
- Red meat
- Pumpkin seeds
- Shellfish

## Supplemental Treatments

### Vitamin C

Vitamin C boosts your immune system and helps fight disease. Vitamin C coupled with iron leads to better absorption of iron in the body.

### High Vitamin C Foods

- Fruits (oranges, strawberries, kiwi, guava, grapefruit)
- Vegetables (broccoli, sweet yellow, red and green peppers, spinach)
- Dried herbs (coriander)

### Vitamin B12

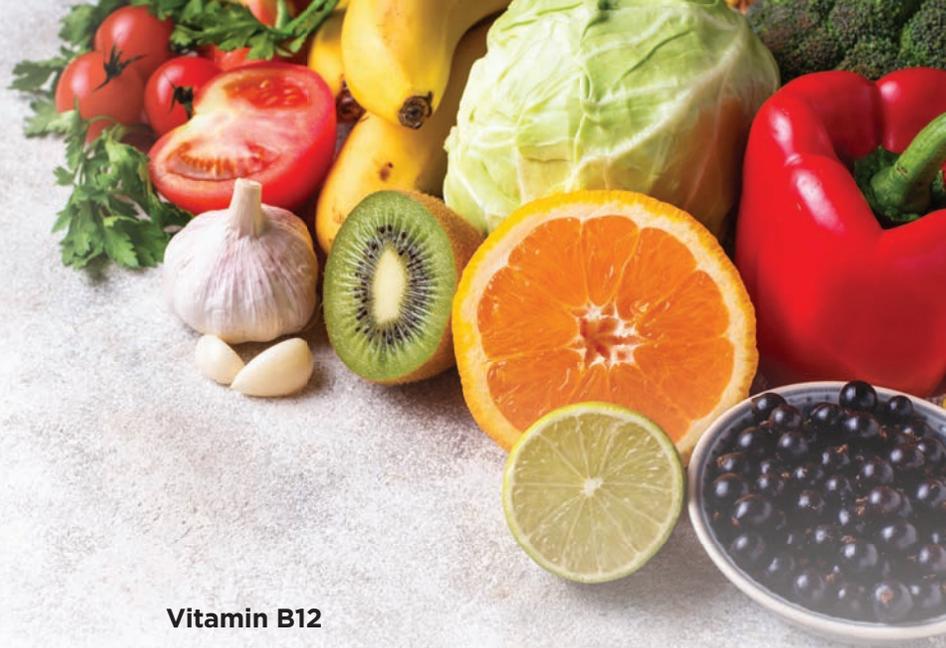
Vitamin B12 is an essential vitamin that is required for the body to function properly. It helps with red blood cell formation and ultimately can prevent anemia.

### Vitamin B12 and Pregnancy

Vitamin B12 is essential for the baby's neural tube formation, brain and spine development. When combined with folate (or folic acid), vitamin B12 works to produce red blood cells. Keeping healthy vitamin B12 levels will also improve your energy and stress levels.

### Food Sources of Vitamin B12

- Eggs
- Dairy (yogurt, milk, cheese)
- Meat and poultry
- Fish (salmon, cod, trout)
- Shellfish (shrimp, oysters, clams)
- Fortified Cereals (any cereal added with extra vitamins )\*





## Folic Acid

Folic Acid is a form of vitamin B called folate. The body uses it to make normal red blood cells and to produce and repair DNA. Folic Acid is essential for normal growth and development.

## Folic Acid and Pregnancy

Folic Acid helps prevent major birth defects that affect the brain, spinal cord, and spine (neural tube defects). The American College of Obstetricians and Gynecologists, The Center for Disease Control and Prevention, and The March of Dimes recommends childbearing women to take 400 mcg of folic acid daily.

## Food Sources with Folic Acid

- Legumes
- Eggs
- Vegetables (spinach, brussel sprouts, asparagus, broccoli, beets)
- Fruits
- Nuts and seeds
- Fortified cereals and grains

For more information on foods visit [myfooddata.com](https://myfooddata.com), powered by the U.S. Department of Agriculture (USDA).

## Erythropoietin

Erythropoietin (EPO) is a hormone that is produced in the kidney and stimulates bone marrow to make red blood cells. The red blood cells produce hemoglobin and prevent anemia.

- Recombinant EPO is a synthetic or “man-made” version of the hormone
- EPO is NOT a blood product, but some forms contain blood fractions (a protein from donor blood)
- Recombinant EPO is administered through an injection.

Possible side effects:

- High blood pressure
- Swelling
- Fever
- Nausea
- Pain at the injection site

**Inform clinical staff immediately if you experience any of these symptoms.**

## Rh-Negative Blood Type and Pregnancy

During your pregnancy, you should expect to be tested for your blood type and Rh factor. Your Rh factor can play a role in your baby's health, so it is important to know this information.

### What is blood type?

Your blood type tells you about markers found on the surface of your red blood cells (RBCs). Your blood type can be A, B, AB, or O.

### What is an Rh Factor?

An Rh Factor is a protein found on some red blood cells. Those that carry this protein are considered Rh-positive and those that do not carry this protein are referred to as Rh-negative.

### I am Rh-negative and pregnant. What does this mean?

If you are Rh-negative and are having a baby who is Rh-positive, you may be exposed to your baby's blood during pregnancy or when you give birth. Your body can make antibodies that can hurt or destroy RBCs that are Rh-positive.

Being Rh-negative will not harm your baby during your first pregnancy. But during your next pregnancy if you are carrying another Rh-positive baby, the antibodies you made when you were first exposed can pass into the baby's bloodstream and attack the baby's RBCs. This is called Rh-sensitization. Rh-sensitization can result in fetal anemia (low iron in the blood), miscarriage, stillbirth, or hemolytic disease of the newborn – a condition where the baby's RBCs swell and rupture. Fortunately, Rh-sensitization is rare because women who are Rh-negative can get an injection to stop their bodies from making antibodies to Rh-positive blood.

### What is RhoGAM?

RhoGAM is an Rh immune-globulin that prevents you from making antibodies that attack Rh-positive blood cells. RhoGAM is a prescription medication given by intramuscular injection. It is typically given at:

- 28 weeks of pregnancy (first dose)
- 72 hours after you delivery (second dose)

A woman may also get RhoGAM if she has had a miscarriage, an amniocentesis, or any bleeding during pregnancy.

If you are pregnant and have any concerns about your Rh-type, please consult your health care provider.

**To schedule an appointment with the  
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**Cooperman Barnabas** | **RWJBarnabas**  
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