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Low Red Blood Cell Counts (Anemia)

What is anemia?

When you don't have enough healthy red blood cells, you have a condition called anemia. This means **your blood has lower than normal hemoglobin (Hgb) levels**. Hemoglobin is the part of the red blood cell (RBC) that carries oxygen to all the cells in your body. Anemia is a common side effect in patients with cancer.

What causes anemia?

There are many different reasons a person with cancer might have anemia. Some common causes are:

- The cancer itself
- Cancer treatment, such as [radiation](#)¹ or [chemotherapy](#)²
- Blood loss (this can be bleeding from a tumor, bleeding from cancer cells getting into blood vessels, or bleeding caused by other conditions like heavy menstruation or bleeding from a stomach ulcer)
- Missing certain vitamins or minerals in the diet because of not eating enough
- Low iron levels in blood
- Major organ problems (including severe heart, lung, kidney, or liver disease)
- Red blood cells (RBCs) being destroyed by the body before they're replaced
- The body making fewer RBCs
- Having chronic kidney disease
- Having conditions like sickle cell disease or thalassemia (inherited disorders of red blood cells)
- A combination of any of these factors

Some risk factors may make a person with cancer more likely to have anemia. These include:

- Certain chemotherapy drugs such as platinum-based chemotherapy (this is a certain group of chemo drugs)
- Certain tumor types (such as lung or ovary tumors)
- Having a low hemoglobin level before you had cancer

Symptoms of anemia

Anemia often starts slowly, so you may not notice symptoms at first. As your hemoglobin level gets lower you may have one or more of these symptoms:

- Fast heartbeat
- Fast breathing rate
- [Shortness of breath](#)³(trouble breathing)
- Trouble breathing when doing things like walking, climbing stairs, or even talking (exerting yourself)
- Dizziness or lightheadedness
- Chest pain
- [Swelling](#)⁴ in the hands and/or feet
- Color of skin, nail beds, mouth, and gums looking more pale than usual
- Extreme tiredness ([fatigue](#)⁵)

Anemia can range from mild to life-threatening, depending on your hemoglobin level and the symptoms you are experiencing. Some of these symptoms are more serious than others. Your doctor will explain your hemoglobin level and the severity of your anemia.

If you have any of these symptoms, tell your doctor or nurse right away. If you can't reach your cancer care team right away, you may need to get immediate care at an emergency room.

Let your cancer care team know if you have any other medical problems such as heart or lung disease, as this may make your symptoms from anemia worse. It's important to watch for anemia and its symptoms throughout your treatment. Tell your cancer care team if you're having any of the symptoms described here. Be sure to mention how the symptoms affect your day-to-day life. Doing so will help you get the treatment you need

when you need it.

Tests for causes of anemia

A **complete blood count (CBC)** is a [blood test](#)⁶ that measures your hemoglobin level and other characteristics of your red blood cells (such as their size). This test not only shows if you have anemia, but it can also help your doctor figure out what might be causing it.

You might also need other tests to help to find what is causing it. These could include:

- **Blood chemistry tests** to check organ function and levels of vitamins and minerals
- A blood test called **a reticulocyte count** (Reticulocytes are very young red blood cells just released from the bone marrow, so this test shows how many new red cells your body is making.)
- **A bone marrow exam** to make sure your bone marrow is working as it should
- Blood tests to look at your **iron, vitamin B12, and folate levels**
- **A test of your stool** (feces) to check for blood (called a **fecal occult blood test** or **FOBT**)

Your doctor or nurse can use the results of these tests, along with your medical information and a physical exam, to get an idea of what might be causing your anemia. Sometimes no cause can be found other than “anemia of chronic disease.” This type of anemia is often found in people with long-lasting problems like congestive heart failure, inflammatory diseases, or cancer.

Problems anemia can cause

The first thing the doctor needs to know is how severe your anemia is. Anemia can affect your quality of life and has been found to shorten survival in people with cancer. It can make you feel very tired because cells in your body can't get enough oxygen. In some cases, this lack of oxygen may be bad enough to threaten your life. Anemia can also make your heart work harder. So if you already have a heart problem, anemia can make it worse. Anemia can also make it hard for you to breath normally, making it challenging to do your usual activities.

Severe anemia may mean you have to delay your cancer treatment or have your treatment dose reduced. It can also cause some cancer treatments to not work as well as they should.

Your cancer care team may try to figure out your risk of serious problems from the anemia based on any symptoms you are having and your hemoglobin level. If you're not having symptoms, they will try to figure out how likely you are to have them in the near future. This will be based on a number of things, including:

- Your hemoglobin level and other lab results
- The type of cancer treatments you've had in the past
- The chances that any treatments you're now getting could make the anemia worse
- Whether you have lung, heart, or blood vessel (circulation) problems
- Your age

If you don't seem to be at risk for problems from anemia, your cancer care team will watch your hemoglobin level closely and ask about symptoms each time you visit the office.

Treatments for anemia

Anemia in cancer patients is usually treated based on the cause. Sometimes, treatment of anemia delays cancer treatment until your red blood cells recover. There are 2 main goals in treating anemia:

- Treat the cause of the anemia
- Raise the hemoglobin level so that symptoms get better

The most common treatments of anemia in patients with cancer include:

- Iron therapy
- Red blood cell transfusion, commonly known as blood transfusion
- Erythropoiesis-stimulating agents (ESAs)
- Other drugs

Your doctor will look at your test results, symptoms, how long you've been having the symptoms, the cancer type, cancer treatment, and other factors. Talk to your cancer care team about what treatment is right for you. As with any medical problem, the expected benefits of treatment should always outweigh the possible risks.

Iron therapy

If your iron levels are low, your doctor may supplement them with iron pills or iron given

through your veins (iron infusion). Iron [infusions](#)⁷ carry a risk of allergic reaction. Your doctor will discuss with you what form of iron would be best for your situation. Your doctor may also ask you to try to eat more iron-rich foods. There are two types of iron in food: heme and non-heme.

Heme iron is found in animal products. Heme iron is more easily absorbed by the body than non-heme iron. Examples of foods that contain heme iron are:

- Red meat
- Fatty fish
- Chicken and turkey

Non-heme iron is found in plant-based foods. Examples of foods that contain high amounts of non-heme iron include:

- Dark green leafy vegetables such as spinach, kale, collard greens, or chard
- Beans and lentils
- Tofu
- Fortified cereals
- Dried fruits such as raisins, apricots, and peaches
- Enriched pasta and rice.

Non-heme iron is best absorbed by the body when eaten at the same time as fruits and vegetables high in Vitamin C. Examples of foods high in vitamin C include

- Citrus fruits
- Tomatoes
- Dark green leafy vegetables
- Berries.

Blood transfusions to treat anemia

A [blood cell transfusion](#)⁸ is a safe and a common way to treat anemia in people with cancer. It can help the patient feel better and helps oxygen get to vital organs. While blood transfusions can help symptoms very quickly, sometimes the relief is temporary depending on the cause of anemia.

Whether a blood transfusion might be needed depends on how severe your symptoms

are and your hemoglobin level. A transfusion might be done if your hemoglobin level reaches a certain number or if your symptoms get too bothersome

A blood transfusion requires careful matching of donated blood to the recipient's blood. Blood products are tested to be sure they are safe and the same kind of blood type as the recipient. But, receiving a blood transfusion also has some risks

- **Transfusion reaction:** This happens when the patient's immune system attacks proteins on the foreign blood cells. This often looks like an allergic reaction. Most of these reactions are minor and can be treated, but sometimes they can be more serious.
- **Transfusion-related lung injury:** This is one of the more serious risks. It can cause trouble breathing and require treatment in the hospital.
- **Getting exposed to certain germs, such as the hepatitis B or C virus:** The careful blood testing and screening that's used today has greatly decreased the risk of infections.
- **Transfusion-related circulatory overload (TACO):** This can happen if blood is given too quickly for the heart to handle it.
- **Iron overload:** People who get many blood transfusions may end up with too much iron, which would then need to be treated.

Erythropoiesis-stimulating agents (ESAs)

Another way to treat anemia in some patients is to use drugs that tell the body to make more red blood cells. ESAs work like a hormone (called **erythropoietin**) made by the kidneys to help the body make its own new red blood cells. If one of these drugs is recommended, your health care provider will talk to you about the risks and the benefits of the drug. These drugs can cause very serious side effects. Still, they can help patients getting chemotherapy have higher hemoglobin levels and need fewer blood transfusions. This may result in a gradual improvement of anemia-related symptoms.

ESAs are given as shots under the skin, and how long they take before they start working may be different for different patients. Talk to your doctor about the risks and benefits of the ESA you will be receiving..

Other drugs to treat anemia

Depending on the type of anemia you have, the anemia may also be treated with vitamin B12 or folic acid supplementation.

Talk to your doctor about what kind of anemia you have, the recommended treatment, and the risks and benefits of the treatment.

Managing anemia at home

What to look for

- New or worsening tiredness that makes it harder to do your regular activities
- Chest pain or shortness of breath when you're active
- Skin, nail beds, or gums that are more pale than usual
- Dizziness
- Weakness
- Bright red, dark red, or black stool
- Dark brown or bright red vomit

(The last 2 are signs of bleeding, which can be a cause of anemia.)

What the patient can do

- Balance rest and activities. Only do activities that you can tolerate
- Keep a log of your symptoms, what time they occur, and what makes them worse or better, and discuss with your health care provider at your appointment
- Tell your cancer team if you're not able to get around as well as usual.
- Plan your important activities when you have the most energy.
- Eat a balanced diet that includes protein (such as fish, meat, eggs, cheese, milk, nuts, peas, and beans). Try to include iron-rich foods in your diet
- Drink 8 to 10 glasses (8 oz) of water a day, unless you are given other instructions by your cancer care team. It's OK to drink other liquids instead of water – just not beer, wine, or other alcoholic drinks. Check with your doctor to see what a safe amount of liquids is for you.

What caregivers can do

- Schedule friends and family members to prepare meals, clean the house, do yard work, or run errands for the patient. You can use websites that help organize these things, or get someone else to look into this for you.
- Watch for confusion, faintness, or dizziness.

Call the cancer care team if the patient

- Has chest pains
- Has shortness of breath when resting
- Feels dizzy or faint
- Gets [confused](#)⁹ or can't concentrate
- Has not been able to get out of bed for more than 24 hours
- Has blood in their stool
- Has dark brown or bright red vomit

Hyperlinks

1. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/radiation.html
2. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/chemotherapy.html
3. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/shortness-of-breath.html
4. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/swelling.html
5. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/fatigue.html
6. www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-your-lab-test-results.html
7. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/infusion-immune-reactions.html
8. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/blood-transfusion-and-donation.html
9. www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/changes-in-mood-or-thinking/confusion.html

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Written by

The American Cancer Society medical and editorial content team
(www.cancer.org/cancer/acs-medical-content-and-news-staff.html)

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