
Low White Blood Cell Counts (Neutropenia)

A lowered level of immunity is called **immunosuppression**. Certain diseases, including cancer, and certain treatments, including chemotherapy and radiation therapy, can cause some people to have immunosuppression. This is usually referred to as having a low white blood cell count, but you might hear other words to describe it too.

What is neutropenia?

Neutropenia is defined as a lower than normal number of neutrophils (a type of white blood cells). White blood cells are part of the immune system. There are different types of white blood cells, and they each have a key role in the body's defense against germs:

- Neutrophils
- Lymphocytes (which include T-lymphocytes and B-lymphocytes)
- Monocytes
- Macrophages

Neutrophils are key infection-fighters

Neutrophils form a very important defense against most types of infection. Normally, most of our white blood cells are neutrophils. In patients with cancer, neutropenia is usually caused by treatment. When looking at your risk of getting an infection, doctors look at the number of neutrophils you have.

If your neutrophil count is low, the doctor may say you are **neutropenic**. For most people with cancer, having a low neutrophil count is the biggest risk factor for getting a

serious infection. Ask your doctor if your cancer treatment will cause your neutrophil count to drop.

Lymphocytes can mark, signal, and destroy germs

Some treatments, most often those given during a [bone marrow \(stem cell\) transplant](#)¹, can cause a shortage of lymphocytes. B and T lymphocytes help fight viruses, but have different jobs:

- B-lymphocytes make special proteins called **antibodies** that recognize and kill certain germs. They also can mark germs to be destroyed by other cells.
- T-lymphocytes make signaling substances called **cytokines** that tell other cells what to do. They also destroy cells infected by viruses.

Monocytes and macrophages help recognize invaders

- They help lymphocytes recognize germs.
- They can surround and digest germs that have been coated by antibodies (the proteins made by B-lymphocytes).
- They help fight bacteria, fungi, and parasites.

What is an absolute neutrophil count (ANC)?

You might hear your doctor or nurse talk about your absolute neutrophil count or ANC. This is the number of neutrophils you have in a certain amount of blood. Your health care team will use your ANC to get an idea of how well your immune system might work during treatment. A [blood test](#)² called a **complete blood count** (CBC) is used to see how well your immune system is working. It measures your white blood cells (WBCs), and your cancer care team is able to figure out your ANC from your WBC count. Your cancer care team will use your ANC to get an idea of how your immune system is affected by treatment and how well it is working to protect you from infection.

As the ANC gets lower, the usual signs of infection, such as fever, pus, pain, swelling, and redness, may not show up when an infection starts. This is because these signs are caused by neutrophils fighting off germs, and if you don't have enough neutrophils to fight infection, you won't produce the signs. This can make it hard to know if you have an infection. The good thing is that another WBC, called the monocyte, can still cause signs of infection in a person who has neutropenia. Sometimes in people with severe

neutropenia a fever may be the only sign of an infection. The lower your ANC is and the longer it stays low, the higher your risk of infection will be.

Ask your doctor if your cancer treatment might cause your neutrophil count to drop. Your cancer care team will help you find the ANC on your lab results and can help explain more about it.

What can cause or increase the risk for neutropenia?

- Some types of chemotherapy
- Radiation therapy
- Bone marrow or stem cell transplant
- Steroids

Symptoms of neutropenia

- Fever
- Chills
- Mouth sores
- Cough
- Difficulty breathing
- Abdominal or rectal pain

Problems neutropenia might cause

- Increased risk for infection
- In a person with a healthy immune system, the usual signs of infection may include fever, pus, pain, swelling, and redness. As the ANC gets lower, many of these signs may not show up when an infection starts. This is because these signs are caused by neutrophils fighting off germs, and you don't have enough neutrophils to produce the signs.
- Your cancer care team may have to delay your treatment or reduce your dose to prevent further neutropenia

Treatment of neutropenia

Treatment may include one or a combination of the following:

- Myeloid growth factors: These are proteins that stimulate the bone marrow to produce more white blood cells to help the body fight infections. They are also known as **growth factors** or **colony-stimulating factors (CSFs)**. Examples of growth factors include filgrastim (Neupogen, [other names](#)³), tbo-filgrastim (Granix), pegfilgrastim (Neulasta, [other names](#)⁴), and eflapegrastim (Rolvedon).
- Antibiotics may be given in certain instances to help prevent infection.
- Cancer treatment may be delayed to give your body enough time to make more white blood cells and recover your ANC.

Talk to your cancer care team about what to watch for. Call your doctor if you have a fever (your cancer care team will let you know what temperature they consider a fever) or any other symptoms of neutropenia.

Hyperlinks

1. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/stem-cell-transplant.html
2. www.cancer.org/treatment/understanding-your-diagnosis/tests/understanding-your-lab-test-results.html
3. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/biosimilar-drugs/list.html
4. www.cancer.org/treatment/treatments-and-side-effects/treatment-types/biosimilar-drugs/list.html

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