

Neutropenia (Low White Blood Cell Counts)

People with a low white blood cell count have a condition called **neutropenia**. Other names for having a low white blood cell count may include leukopenia, low WBC, low leukocyte count, and being immunocompromised.

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What causes neutropenia?

Neutropenia can be caused by cancer, cancer treatments, or something not related to cancer. Some common causes are:

- **Cancers affecting the bone marrow** (leukemias, lymphomas, multiple myeloma)
- **Cancer treatments** such as chemo, targeted drug therapy, and bone marrow or stem cell transplant
- **Disorders that affect the bone marrow** such as [myelodysplastic syndromes¹](#) (MDS)
- **Many types of infections** such as COVID-19, Epstein-Barr virus (EBV), HIV, and hepatitis

- **Immune conditions** such as rheumatoid arthritis (RA) or systemic lupus erythematosus (lupus)
- **Nutrition problems** including low vitamin B12, copper, or folate
- **Chronic idiopathic neutropenia** (CIN) is long-term neutropenia without a clear cause

If chemotherapy, medicine, or other treatment is causing neutropenia, the dose might be lowered, the treatment switched, or the treatment held off until your body recovers.

What do white blood cells do?

White blood cells (WBCs) are part of our immune system. The immune system protects the body from infection and other immune problems.

Each type of white blood cell has a certain job in your immune system. So, levels of certain types of white blood cells might be higher or lower depending on what's going on in your body.

- **Neutrophils** make up over half of our WBCs. They destroy bacteria.
- **Lymphocytes** use and create antibodies to attack bacteria and viruses.
- **Eosinophils** help with inflammation, parasites, and allergic reactions.
- **Basophils** help with asthma and allergic reactions.

When you're sick, more neutrophils are released, causing other WBC levels to go down. When you have bad allergies, your eosinophils or basophils might increase.

How is neutropenia diagnosed?

Neutropenia itself doesn't usually cause any signs or symptoms.

If you are getting medicine or other treatments that often cause neutropenia, your cancer care team might check your white blood cell counts with blood tests.

- [Blood tests](#)² such as complete blood count with differential (CBC with diff), complete metabolic panel (CMP), and blood cultures to check your organs and levels of vitamins and minerals
- [Tests on body fluids](#)³ (such as stool, urine, sputum, or spinal fluids)
- [Imaging scans](#)⁴ (such as an x-ray, MRI, or CAT scan)

Signs and symptoms of infection in people with cancer

The signs and symptoms of infection depend on the cause. Some of the most common ones are:

- Fever
- Chills and sweats
- Fast heartbeat
- Breathing problems or cough
- Dizziness or lightheadedness
- Rash, redness, swelling, or sores on the skin (especially near the genitals, rectum, or around a catheter, tube, or drain)
- Pus or yellow discharge from a wound, injury, or drain or catheter
- Pain or swelling in the joints or bones
- Pain, swelling, or sores in the gums, mouth, or throat
- Pain in the abdomen (belly) or rectum
- Pain or burning when peeing
- Sore throat
- Sores or white patches in the mouth or on the tongue

How is neutropenia treated?

Managing neutropenia depends on the cause. But if you have signs of an infection and have a low WBC count, you might be started on a treatment before they know what is causing it.

- **Antibiotics, antiviral, and antifungal medicines** are often given when someone has a low WBC and is having fever.
- **Growth factors** are medicines that help the bone marrow make more white blood cells. They are also called granulocyte colony-stimulating factors (G-CSFs). They're usually given as a shot.

What is an absolute neutrophil count (ANC)?

Absolute neutrophil count (ANC) is the number (instead of the percentage) of

neutrophils you have in a certain amount of blood. Your cancer care team will use your ANC to get an idea of how well your immune system is working during treatment. This test measures the total number of WBCs and what percent of that total number are neutrophils, lymphocytes, monocytes, eosinophils, and basophils. You will also see an ‘absolute’ number for each type of WBC.

Every lab has its own set range of what it considers normal. So, the normal range (or reference range) might be slightly different depending on where you have your tests done.

What is the nadir?

You might also hear the word **nadir** when your cancer care team is talking about your blood counts or ANC. When the number of white blood cells goes down because of cancer treatments (especially chemotherapy), the very lowest number is called the **nadir**.

The nadir usually occurs about 7 to 10 days after getting chemo. This is when a person is most at risk for a severe infection. Numbers of other blood cells (red blood cells and platelets) may be very low as well. After a nadir, blood counts start to slowly increase as the cells in your body recover.

If you have neutropenia

- Wash your hands often. If you don't have soap and clean running water, use hand sanitizer or hand wipes.
- Avoid large crowds of people and people who are sick. Wear a mask if you go out.
- Don't share toothbrushes, forks, spoons, cups, or straws.
- Don't let your pets lick your face.
- Ask your doctor which vaccines you should get and when.

When to get help

Call your cancer care team or get medical help if you have:

- A temperature over 100.4 F
- Chills or sweating
- New or worsening confusion

- Dizziness, lightheadedness, or have been falling down
- Chest pain
- Trouble breathing even at rest

Learn more about [neutropenic fevers, infection, and sepsis](#)⁵ in people with cancer.

Hyperlinks

1. www.cancer.org/cancer/types/myelodysplastic-syndrome.html
2. www.cancer.org/cancer/diagnosis-staging/tests/understanding-your-lab-test-results.html
3. www.cancer.org/cancer/diagnosis-staging/tests/understanding-your-lab-test-results.html
4. www.cancer.org/cancer/diagnosis-staging/tests/imaging-tests.html
5. www.cancer.org/cancer/managing-cancer/side-effects/infections.html

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Last Revised: February 6, 2024

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