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## Infections in People with Cancer

People who have cancer or who are getting cancer treatment often have a higher risk of getting an infection, and infections can be more serious than in people who don't have cancer. It's important for patients and caregivers to know the signs of an infection and when to get help.

[Why Are People with Cancer More Likely to Get Infections?](#)

[Managing Infections and Sepsis in People with Cancer](#)

[Preventing Infections in People with Cancer](#)

[Fevers](#)

[Vaccinations and Flu Shots for People with Cancer](#)

### Related Topics

- [Neutropenia \(Low White Blood Cell Counts\)](#)
- [Food Safety During Cancer Treatment](#)
- [Caring for Pets During Cancer Treatment](#)
- [Questions About COVID-19 and Cancer](#)
- [COVID-19 Vaccines in People with Cancer](#)

### Video

Find out how to protect your body from getting sick if you have cancer. Follow these tips to help stay healthy during and after cancer treatment.

[Watch this video on YouTube](#)

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# Why Are People with Cancer More Likely to Get Infections?

People with cancer may have a higher risk of infection because of changes in the immune system that control their body's defense systems.

- [What types of cancer increase a person's infection risk?](#)
- [Which cancer treatments increase infection risk?](#)
- [Nutrition and infection risks in people with cancer](#)

Many treatments for cancer can lower your white blood cell counts (causing a condition called **neutropenia**) and other cells in your immune system. This makes people with cancer more likely to get an infection because their immune system isn't working as well as it should. Other things that can increase your risk of infection include :

- Certain types of cancer and cancer treatments
- Having a [central line, tube, or drain](#)<sup>1</sup>
- Mouth or throat sores
- Being in the hospital for a very long time
- Having had a [bone marrow or stem cell transplant](#)<sup>2</sup>
- Having had an organ transplant
- Not getting enough sleep
- Poor nutrition
- Other medicines that affect your immune system (such as steroids)
- Having other health conditions such as diabetes, heart or lung problems, or autoimmune disorders

Talk to your cancer care team about what might put you at higher risk for infection.

## What types of cancer increase a person's infection risk?

Some types of cancer can increase the risk for infection:

- Cancers that grow in the bone marrow and crowd out normal blood cells (such as leukemias, lymphomas, and multiple myeloma)
- Tumors that damage or break through tissues inside the body and let in germs.

## Which cancer treatments increase infection risk?

Some [cancer treatments](#)<sup>3</sup> cause immune system problems for a short time. Others can cause long-term immune problems.

The most common cancer treatments that can increase risk for infection include:

- Surgery
- Chemotherapy
- Radiation therapy
- Immunotherapy
- Targeted drug therapy
- Bone marrow or stem cell transplant

## Nutrition and infection risks in people with cancer

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/making-treatment-decisions/tubes-catheters-drains.html](http://www.cancer.org/cancer/managing-cancer/making-treatment-decisions/tubes-catheters-drains.html)
2. [www.cancer.org/cancer/managing-cancer/treatment-types/stem-cell-transplant.html](http://www.cancer.org/cancer/managing-cancer/treatment-types/stem-cell-transplant.html)
3. [www.cancer.org/cancer/managing-cancer/treatment-types.html](http://www.cancer.org/cancer/managing-cancer/treatment-types.html)
4. [www.cancer.org/cancer/survivorship/coping/nutrition.html](http://www.cancer.org/cancer/survivorship/coping/nutrition.html)
5. [www.uptodate.com/contents/infection-prevention-precautions-for-preventing-transmission-of-infection?source=history\\_widget](https://www.uptodate.com/contents/infection-prevention-precautions-for-preventing-transmission-of-infection?source=history_widget)

## References

Anderson DJ. Infection prevention: precautions for preventing transmission of infection. *UpToDate*. UpToDate Inc; 2023. Updated March 2023. Accessed November 29, 2023. <https://www.uptodate.com/contents/infection-prevention-precautions-for-preventing-transmission-of-infection?>

Jatoi A & Loprinzi C. Pathogenesis, clinical features, and assessment of cancer

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# Managing Infections and Sepsis in

white blood cell count). A fever is often the only sign of an infection in people with neutropenia. Ask your cancer care team if and how often you need to check your temperature and when to call or get medical help.

Some cancer care teams can give you a thermometer if you don't have one. You can also get an oral thermometer (one that goes in your mouth) at any drugstore or pharmacy.

## Finding the cause of infection

If your doctor or cancer care team is worried you might have an infection, they'll need to know what type of infection and where in the body it is. This helps them choose the best medicines and treatment.

Depending on what signs or symptoms you're having, you'll get tests to look for the cause of the infection. This might include:

- [Blood tests](#)<sup>2</sup>
- [Imaging tests](#)<sup>3</sup> (such as an x-ray or CT scan)
- Samples of body fluids (such as sputum, urine, or stool)
- Samples of fluid from a wound or other area (such as around a catheter)

They might start you on a few medicines right away, while waiting for test results. This is to keep the infection from getting worse. Once they find out what types of germs are causing the infection, they will make sure you're taking the correct medicines for that type of infection.

## Treating infections in people with cancer

Infections are treated most effectively when the type of germ that is causing them is known. **Anti-infectives** is a general word for the different types of medicines used to treat infections. The most common types of anti-infectives used for people with cancer are:

- **Antibiotics** for infections caused by **bacteria** (such as urinary tract infections caused by *E coli* or *Pseudomonas* bacteria)
- **Antivirals** for infections caused by **viruses** (such as viral pneumonia caused by influenza or coronavirus)
- **Antifungals** for infections caused by **fungi** (such as thrush or yeast infections)

caused by candida yeast)

- **Antiprotozoals** for infections caused by **protozoa** (such as toxoplasmosis caused by a parasite called *Toxoplasma gondii*)

## Signs and symptoms of sepsis

Once there are signs of organ damage from sepsis, it's called **septic shock**. Common signs of septic shock include:

- A fast heart rate
- Low blood pressure
- Confusion
- Pale, cold, or clammy skin
- Nausea
- Breathing problems

Sepsis can turn into septic shock quickly. People with septic shock might need intensive care, medicines for blood pressure, and even breathing tubes. People with cancer who develop sepsis and septic shock have a higher risk of death than people who don't have cancer. Sepsis also increases your risk for getting a blood clot.

## When to get help

If you have a fever or other signs of infection, call your cancer care team, or get medical attention right away.

Signs of infection and sepsis to watch for:

Fever or lower body temperature (When to get help) | [Fever or lower body temperature](#)

**If you go to the doctor, clinic, or emergency department, wear a face mask to protect yourself from other sick people.**

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/treatment-types.html](http://www.cancer.org/cancer/managing-cancer/treatment-types.html)
  2. [www.cancer.org/cancer/diagnosis-staging/tests/understanding-your-lab-test-results.html](http://www.cancer.org/cancer/diagnosis-staging/tests/understanding-your-lab-test-results.html)
-



2023. <https://www.uptodate.com/contents/diagnostic-approach-to-the-adult-cancer-patient-with-neutropenic-fever>

Wingard JR. Overview of neutropenic fever syndromes. *UpToDate*. UpToDate Inc; 2023. Updated May 2022. Accessed November 21, 2023. <https://www.uptodate.com/contents/overview-of-neutropenic-fever-syndromes>

Wingard JR. Prophylaxis of infection during chemotherapy-induced neutropenia in high-risk adults. *UpToDate*. UpToDate Inc; 2023. Updated July 2022. Accessed November 21, 2023. <https://www.uptodate.com/contents/prophylaxis-of-infection-during-chemotherapy-induced-neutropenia-in-high-risk-adults>

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# Preventing Infections in People with Cancer

Infection is one of the most common complications of cancer and cancer treatment. It's important to know how to protect yourself from getting sick. Infections that aren't serious for many people (such as the flu) can become severe for people with weakened immune systems.

- [Types of infections in people with cancer](#)
- [Medicines to prevent infection](#)
- [Lowering your risk of infection](#)
- [Questions to ask your cancer care team](#)
- [When to get help](#)

## Types of infections in people with cancer

Bacteria are the most common cause of infection in people with cancer. Other types of germs (also called pathogens or microorganisms) include viruses, fungi, and parasites (protozoa).

## Opportunistic infections in people with cancer

Many types of infections are common and anyone can get them, but most people can recover because they have a healthy immune system. Some infections are more common or severe in people with weak immune systems. These types of infections are

called **granulocyte colony-stimulating factors (G-CSFs)**. They are given after certain types of chemotherapy that are known to severely weaken the immune system.

## Lowering your risk of infection

Here are things you can do to lower your risk of infection when your immune system is weak.

- The most important thing you can do to prevent infection is cleaning your hands. Use soap and water or hand sanitizer.
- Take a shower or bath every day.
- Use an unscented lotion to prevent dryness.
- Wear protective gloves if you're using sharp tools.
- Keep any cuts or wounds clean and dry.
- Take care of your mouth. Brush your teeth at least twice a day. Get dental checkups every 6 months.
- Don't share toothbrushes, forks, spoons, cups, or straws.

## Avoid common sources of infection

- Don't let your pets lick your face.
- Avoid large crowds and people who are sick. Wear a mask if you go out.
- Stay away from areas where dust from the ground is being blown into the air, such as construction sites.

## Practice food safety tips

- Cook all meats to the recommended safe temperature.
- Wash all fresh fruits and vegetables.
- Avoid buffets or self-serve food stations.
- Don't eat expired foods or foods that smell strange.

You can learn more about [food safety for people with cancer](#)<sup>1</sup> and what to watch for when you have low white blood cell counts.

## Questions to ask your cancer care team

- Ask about your white blood cell (WBC) counts. They're usually at their lowest (nadir) about 7 to 12 days after chemo starts. Even though you can get an infection at any time, this is when you're most likely to get seriously ill from an infection.
- Ask your cancer care team which vaccines you should get and when.
- If you're planning any travel, ask if there are any precautions you should take.

Always keep the cancer care team's contact information with you. Make sure you know when and who to call during and after regular office hours. If you go to the emergency room or urgent care, tell them you have cancer and recently received cancer treatment.

## When to get help

If you have a fever or other signs of infection, call your cancer care team, or get medical help as soon as possible.

If you have these signs of infection or sepsis (an extreme, life-threatening reaction to infection), go to the emergency room:

- Chills or sweats
- Cold, clammy, or pale skin
- Cough or trouble breathing
- New or worse confusion
- Feeling dizzy, lightheaded, or falling down
- Chest pain
- Not able to get out of bed for more than 24 hours
- Not having to pee or peeing only very little amounts that are dark orange or brown

**If you go to the doctor, clinic, or emergency department, wear a face mask to protect yourself from other sick people.**

If you have an infection, learn more about how they are treated in [Managing Infections and Sepsis in People with Cancer](#).

## Hyperlinks

1. [www.cancer.org/cancer/survivorship/coping/nutrition/weak-immune-system.html](http://www.cancer.org/cancer/survivorship/coping/nutrition/weak-immune-system.html)

## References

National Comprehensive Cancer Network (NCCN). Anemia and neutropenia: Low red and white blood cell counts. NCCN Guidelines for Patients. Updated 2021. Accessed November 21, 2023. <https://www.nccn.org/patients/guidelines/content/PDF/anemia-patient-guideline.pdf>

National Comprehensive Cancer Network (NCCN). Prevention and treatment of cancer-related infections. Version 1.2023. NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines). Updated June 2023. Accessed November 21, 2023. [https://www.nccn.org/professionals/physician\\_gls/pdf/infections.pdf](https://www.nccn.org/professionals/physician_gls/pdf/infections.pdf)

Taplitz RA, Kennedy EB, Bow EJ, et al. Antimicrobial prophylaxis for adult patients with cancer-related immunosuppression: ASCO and IDSA clinical practice guideline update. *J Clin Oncol*. 2018 Oct 20;36(30):3043-3054. doi: 10.1200/JCO.18.00374.

Wingard JR. Overview of neutropenic fever syndromes. UpToDate. UpToDate Inc; 2023. Updated May 2022. Accessed November 21, 2023. <https://www.uptodate.com/contents/overview-of-neutropenic-fever-syndromes>

Wingard JR. Prophylaxis of infection during chemotherapy-induced neutropenia in high-risk adults. UpToDate. UpToDate Inc; 2023. Updated July 2022. Accessed November 21, 2023. <https://www.uptodate.com/contents/prophylaxis-of-infection-during-chemotherapy-induced-neutropenia-in-high-risk-adults?>

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## Fevers

Infection is the most common cause of fevers in people with cancer. In patients with low white blood cells (neutropenia), fever may often be the first and sometimes only sign of infection.

- [What is a fever?](#)
- [What causes a fever?](#)
- [What are neutropenic fevers?](#)
- [If you have neutropenic fevers](#)
- [Talk to your doctor or cancer care team](#)

## What is a fever?

When your temperature is higher than normal for you, you are thought to have a fever. Normally, body temperature is between 95.5 to 99.9 (35.3 to 37.7). Your body temperature can also vary depending on your age, the time of day, and how and where it's measured. For people with cancer, a fever is defined as a temperature of 100.4 (38) or higher for at least one hour.

## What causes a fever?

Fevers can be caused by:

- Infection
- Inflammation
- Reactions to medicines or cancer treatments
- Tumors
- A [blood clot](#)<sup>1</sup> in the lungs (pulmonary embolism or PE)

In people with cancer, infection is the most common cause of fevers. People with cancer have a higher risk of infection because many cancer treatments can lower your white blood cell counts (called [neutropenia](#)<sup>2</sup>). White blood cells fight infection.

## What are neutropenic fevers?

When a person has fever **and** a low white blood cell count, it's called **neutropenic fever** or **febrile neutropenia** (FN). If you are neutropenic, it means you don't have enough neutrophils (or white blood cells) to fight off infection.

When you're neutropenic, you might not have all the common symptoms of an infection. You might not have chills, sweats, or a cough. Some people with severe neutropenia might not have any signs of infection at all or might even have a lower-than-normal body temperature.

Learn more about [neutropenia and low white blood cell counts](#).<sup>3</sup>

## Checking your temperature

Here are a few things to know about taking your temperature:

- Use a thermometer that goes in your mouth (oral). They are usually more accurate than temperatures taken from the armpit, ear, or forehead.
- Always clean your thermometer before and after use. Wash it with warm water and soap, or a cotton ball with isopropyl or rubbing alcohol.
- If you don't have a thermometer, ask your cancer care team for one or where to get one. They might have one you can take home.
- **Never place a thermometer in your rectum if you are on oral chemotherapy.**

## If you have neutropenic fevers

When you're on chemotherapy, a fever might be the first sign of an infection. If you have a fever, call your cancer care team right away.

1. [www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/blood-clots.html](http://www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/blood-clots.html)
2. [www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/neutropenia.html](http://www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/neutropenia.html)
3. [www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/neutropenia.html](http://www.cancer.org/cancer/managing-cancer/side-effects/low-blood-counts/neutropenia.html)

## References

National Comprehensive Cancer Network (NCCN). Anemia and neutropenia: Low red and white blood cell counts. NCCN Guidelines for Patients. Updated 2021. Accessed November 21, 2023. <https://www.nccn.org/patients/guidelines/content/PDF/anemia-patient-guideline.pdf>

National Comprehensive Cancer Network (NCCN). Prevention and treatment of cancer-







**For people with cancer:** In general, **anyone with a weak immune system should not get any vaccines that contain live viruses.** These vaccines can sometimes cause serious infections in people with weak immune systems.

Your doctor can help guide you about which vaccines are safe while your immune system is weak. Be sure to also talk to your doctor before anyone you spend a lot of time with (such as your children or other household members) gets any vaccines.

**For family members and caregivers of people who have cancer:** If you live with or spend a lot of time with a person who has cancer and might have a weakened immune system, it's important to talk to the doctor if you or anyone close to you is due for a vaccination of any kind. Usually, most age-appropriate vaccines can be given, but there are some exceptions.

## Flu vaccines

The Centers for Disease Control and Prevention (CDC) recommends everyone 6 months and older get a flu vaccine each year, although there are some rare exceptions.

The flu shot is a vaccine that is given to reduce your risk of getting influenza (a viral infection often called "the flu"). In people with cancer and weakened immune systems, it's important to prevent the flu because it can be serious and sometimes life-threatening. It is recommended that people with cancer get the flu shot that has an inactive (dead) flu virus every year. There is usually a different kind of flu virus expected each year, so the flu vaccines are a little different each year to help them be as effective as possible. Your cancer care team will tell you when the best time to receive the flu vaccine is depending on your cancer type and treatment.

The nasal mist version of the flu vaccine contains a weakened version of the **live virus**. **People with cancer should not get the nasal mist flu vaccine.**

**For family members and caregivers of people with weakened immunity:** It is recommended that people who live with or care for a person at high risk for flu-related problems get the flu vaccine, too. This means that if you're being treated for cancer, your family members, caregivers, and children aged 6 months and older living at home should get the flu shot.

Family members and caregivers of a person with cancer can usually get the nasal spray (at least in some flu seasons) unless the person has a severely weakened immune system and/or is being cared for in a germ-protected area. For example, household members should not get the nasal mist vaccine if a family member has recently had a

stem cell or bone marrow transplant.

Talk to your doctor for more information or if you have questions about your specific

RSV vaccines are available for adults aged 60 and over, as well as for adults in their 50s who are at higher risk of major problems from RSV. These vaccines are made of either RSV proteins or messenger RNA (mRNA, a type of genetic material), not live viruses, so they are safe to give to people with weakened immune systems.

The CDC recommends that people 75 and older get the RSV vaccine, as well as people aged 60 to 74 who are at increased risk of having problems from RSV.

## **MMR (measles-mumps-rubella) vaccine**

This vaccine is used to protect people from 3 viral diseases: measles, mumps, and rubella.

People who have weak immune systems should not get the MMR vaccine because it contains **live viruses**. But it's usually safe for other household members to get it. If needed, your doctor may consider giving you the vaccine before cancer treatment starts.

Talk to your doctor for more information or if you have questions about your situation.

**After exposure to measles:** If you have a weakened immune system and are exposed to someone with measles, let your doctor know right away. Sometimes, medicines can be given to help fight the measles infection before it starts.

## **Pneumococcus (pneumococcal pneumonia) vaccine**

This vaccine can help people with weak immune systems fight off certain lung, blood, or brain infections caused by certain bacteria. Your doctor may recommend one or more doses of the pneumococcal vaccine, depending on your age and health. In cases where people are having their spleen removed, this vaccine may be given before surgery or sometimes after surgery.

Ask your doctor if you need to get the pneumococcal vaccine and when you need to get it.

## **Meningococcal vaccines**

This vaccine helps prevent meningococcal disease, which can cause meningitis or other infections. This vaccine is typically not given during cancer treatment. It may be offered before treatment, or after a person's immune system has recovered. In cases where a

person is having their spleen removed, this vaccine may be given before surgery.

chickenpox, the virus stays dormant (inactive) in the body. It can sometimes reactivate years later and cause shingles.)

If you have a weak immune system from cancer or cancer treatment, talk to your doctor about chickenpox and shingles vaccine options and whether one of these vaccines might be right for you.

### Getting a Flu Shot When You Have Cancer

It's important to know which vaccines are safe for people with weak immune systems due to cancer and its treatment. Learn more here.

## Hyperlinks

1. [www.cancer.org/cancer/managing-cancer/treatment-types.html](http://www.cancer.org/cancer/managing-cancer/treatment-types.html)
2. [www.cancer.org/cancer/managing-cancer/coronavirus-covid-19-and-cancer/covid-19-vaccines-in-people-with-cancer.html](http://www.cancer.org/cancer/managing-cancer/coronavirus-covid-19-and-cancer/covid-19-vaccines-in-people-with-cancer.html)
3. [www.cancer.org/cancer/types/leukemia.html](http://www.cancer.org/cancer/types/leukemia.html)
4. [www.cancer.org/cancer/types/lymphoma.html](http://www.cancer.org/cancer/types/lymphoma.html)

## References

Ariza-Heredia EJ, Chemaly RF. Practical review of immunizations in adult patients with cancer. *Human Vaccines & Immunotherapy*. 2015;11(11):2606-2614.

Brant JM, Stringer LH. Neutropenia & infection. In Brown CG, ed. *A Guide to Oncology Symptom Management*. 2<sup>nd</sup> ed. Pittsburgh, PA: Oncology Nursing Society; 2015:377-378.

Centers for Disease Control and Prevention (CDC). Chickenpox Vaccination: What Everyone Should Know. 2023. Accessed at <https://www.cdc.gov/vaccines/vpd/varicella/public/index.html> on September 12, 2023.

Centers for Disease Control and Prevention (CDC). Frequently Asked Questions About RSV Vaccine for Adults. 2023. Accessed at <https://www.cdc.gov/vaccines/vpd/rsv/hcp/older-adults-faqs.html> on September 12, 2023.

Centers for Disease Control and Prevention (CDC). People at High Risk for Flu Complications. 2023. Accessed at <https://www.cdc.gov/flu/highrisk/index.htm> on September 12, 2023.

Centers for Disease Control and Prevention (CDC). Shingles Vaccination. 2023. Accessed at <https://www.cdc.gov/vaccines/vpd/shingles/public/shingrix/index.html> on September 12, 2023.

National Comprehensive Cancer Network (NCCN). NCCN Clinical Practice Guidelines in Oncology: Prevention and treatment of cancer-related infections. Version 1.2023. Accessed at [https://www.nccn.org/professionals/physician\\_gls/PDF/infections.pdf](https://www.nccn.org/professionals/physician_gls/PDF/infections.pdf) on September 12, 2023.

Palmore TN, Parta M, Cuellar-Rodriguez J, Gea-Banacloche JC. Infections in the cancer patient. In DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2019:2037-2068.

Shah MK, Kamboj M. Immunizing cancer patients: Which patients? Which vaccines? When to give? *Oncology*. 2018; 32(5):254-258.

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Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as editors and translators with extensive experience in medical writing.

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