

Preventing, Managing
& Treating Infection
in Adults Living
With Cancer

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The CancerCare Connect® Booklet Series offers up-to-date, easy-to-read information on the latest treatments, managing side effects and coping with cancer.

Founded in 1944, CancerCare® is the leading national organization providing free, professional support services and information to help people manage the emotional, practical and financial challenges of cancer. Our comprehensive services include case management, counseling and support groups over the phone, online and in person, educational workshops, publications and financial and co-payment assistance. All CancerCare services are provided by master's-prepared oncology social workers.

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CancerCare®
National Office
275 Seventh Avenue
New York, NY 10001

Toll-free 800-813-HOPE (4673)
Fax 212-712-8495
Email info@cancercare.org
Web www.cancercare.org

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EDITOR

Ruth E. Berggren, MD, MACP

Professor of Medicine, Director, Center for Medical Humanities & Ethics, UT Health San Antonio

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Our immune system is a complex network of organs, cells and molecules that protects us from infection.

Cancer and its treatment can weaken the immune system, increasing the risk of infection from foreign substances such as viruses, bacteria and fungi.

For example:

- **Chemotherapy.** Chemotherapy may lower neutrophils, a type of white blood cell that plays a key role in fighting infection.
- **Immunotherapy.** Some cancer-targeting immunotherapies modify the immune system to recognize that the cancer is foreign to the body and needs to be attacked. However, these drugs may also attack healthy cells, triggering side effects that can lead to infection.
- **Surgery.** Any type of surgery, including surgery as a cancer treatment, carries a risk of infection.
- **Medical devices.** Devices such as catheters and ports that deliver cancer drugs to the body can cause an infection.
- **The cancer itself.** The risk of infection can also be increased in blood cancers such as leukemia, lymphoma and myeloma.



Preventing Infections

Following is guidance to help prevent infections during cancer treatment:

- **Understand your white blood cell count.** If you are receiving chemotherapy, talk to your doctor about when your white blood cell count is likely to be at its lowest, as that is when you are at the highest risk of infection.
- **Keep up with your immunizations.** Talk to your health care team about the vaccines you should get and when they should be given.
- **Put an extra emphasis on cleanliness.** Wash your hands often with warm water and soap. Keep cuts, scrapes and surgical scars clean. Pay special attention to keeping the skin at the site of catheters and ports clean.
- **Avoid crowded places.** If you can't avoid being with a large group of people, maintain social distancing and wear a mask, especially indoors. Additionally, stay away from people who are sick or have been recently exposed to a viral illness.
- **Pay attention to your oral hygiene.** Brush, rinse and floss as recommended by your dentist to control mouth bacteria. While most of these bacteria are harmless, some can enter the digestive system and cause infection.
- **Stay hydrated.** Drinking the recommended amount of water provides the cells with oxygen, which helps protect from the effect of viruses. Experts commonly recommend 64 ounces each day, but check with your health care team about what is right for you.
- **Be aware of your eating habits.** Don't share food, utensils or drinking glasses. Avoid food that is raw or undercooked.

Preventing Neutropenia

Neutropenia is a condition in which there are abnormally low levels of neutrophils, a type of white blood cell that helps prevent and fight infections. If it occurs, chemotherapy-induced neutropenia typically happens 3-7 days following receiving chemotherapy. The severity depends on the type and dose of the chemotherapy.

Chemotherapy-induced neutropenia—and the resulting increased risk of infection—can be prevented by the use of drugs that stimulate cells in bone marrow to produce additional white blood cells. The white blood cell boosters approved by the U.S. Food and Drug Administration (FDA) are filgrastim (Neupogen), pegfilgrastim (Neulasta) and sargramostim (Leukine).

Treating Infections

General signs of a possible infection include fever, fatigue, cough or diarrhea. If you had surgery, be on the alert for redness and/or swelling at the incision site. If treated by external radiation therapy, open skin or painful areas could indicate the presence of an infection.

Contact your health care team right away if you experience any of these symptoms. Your doctor will recommend a treatment approach tailored to the type of infection and your individual circumstances.

Viral Infections

Viral infections are passed from person to person. They include the common cold, the flu, herpes, coronaviruses, mononucleosis (mono), measles, viral pneumonia, viral hepatitis, viral meningitis and human immunodeficiency virus (HIV).

Most often, treating viral infections focuses on relieving symptoms until the immune system can get rid of the infection. There are antiviral drugs for certain types of viral infections, including HIV, herpes and hepatitis C.

Antibiotics are not effective in treating viral infections and should not be used. See “What is antimicrobial resistance?” in the Frequently Asked Questions section.



Bacterial infections

Bacteria are single-celled organisms found in air, soil and water, as well as on (and in) our bodies. Most of the bacteria in our bodies is not harmful and some are actually helpful—for example, bacteria in the digestive tract help in the digestion of food. But some bacteria can cause an infection.

Here are examples of bacterial infections:

- Bacterial food poisoning (e.g., E. coli, Salmonella)
- Bacterial meningitis
- Botulism
- Lyme disease
- Pneumococcal pneumonia
- Strep throat
- Tuberculosis
- Urinary tract infections (UTIs)
- Whooping cough

Bacterial infections are usually treated with antibiotics, medications that can either destroy bacteria or stop them from multiplying. The “class” (type) of antibiotic prescribed depends on the kind of bacteria causing the infection.

If your doctor prescribes a course of antibiotics, it’s important to take all of the medication even if you begin to feel better after a few days.



Fungal infections

Fungi are a group of organisms that include yeasts, molds and mushrooms. Fungi produce spores, microscopic particles that allow them to reproduce. Fungi spores are widespread in the environment, and people breathe in or come in contact with them every day without getting sick. However, people with weakened immune systems have a higher risk of developing an infection from fungi spores.

The symptoms of a fungal infection vary depending on the type of fungi, but typically include red, itchy, inflamed and/or cracking skin.

Fungal infections are often treated with creams, gels and lotions that are applied directly to the skin. Some infections are treated with prescription antifungal medication taken orally (by mouth) and corticosteroids. It is also important to keep the affected area dry.

There are certain types of fungal infections more commonly seen in people with weakened immune systems. Those types include:

- **Aspergillosis**, caused by a common mold than can live both outdoors and indoors.
- **Candidiasis**, a yeast infection commonly seen in the mouth and throat (also called “thrush”) or in the vagina.
- **Invasive candidiasis**, a more serious form of candidiasis that can affect the blood, heart, brain, bones and other parts of the body.
- **Mucormycosis**, a rare but serious infection caused by a group of molds called mucormycetes.
- **Pneumocystis pneumonia (PCP)**, which causes inflammation and fluid buildup in the lungs.

Treatment depends on the specific type of fungal infection and its severity.



The Importance of Clinical Trials

Clinical trials are the standard by which we measure the worth of new treatments and the quality of life of patients as they receive those treatments. For this reason, doctors and researchers urge people with cancer to take part in clinical trials.

Your doctor can guide you in making a decision about whether a clinical trial is right for you. Here are a few things that you should know:

- Often, people who take part in clinical trials gain access to and benefit from new treatments.
- Before you participate in a clinical trial, you will be fully informed as to the risks and benefits of the trial, including any possible side effects.
- Most clinical trials are designed to test a new treatment against a standard treatment to find out whether the new treatment has any added benefit.
- You can stop taking part in a clinical trial at any time for any reason.

General Side Effects

In addition to increasing the risk of infection, some side effects may occur across treatment approaches. This section provides tips and guidance on how to manage these side effects should they occur.

Managing Digestive Tract Symptoms

Nausea and vomiting

- Avoid food with strong odors, as well as overly sweet, greasy, fried or highly seasoned food.
- Eat meals that are chilled, which often makes food more easily tolerated.
- Nibble on dry crackers or toast. These bland foods are easy on the stomach.
- Having something in your stomach when you take medication may help ease nausea.

Diarrhea

- Drink plenty of water. Ask your doctor about using drinks such as Gatorade, which provide electrolytes as well as liquid.
- Over-the-counter medicines such as loperamide (Imodium A-D and others) and prescription drugs are available for diarrhea but should be used only if necessary and after having a discussion with a member of your health care team.
- Choose fiber-dense foods such as whole grains, fruits and vegetables, all of which help form stools.
- Avoid food high in refined sugar and those sweetened with sugar alcohols such as sorbitol and mannitol.

Loss of appetite

- Eating small meals throughout the day is an easy way to take in more protein and calories, which will help maintain your weight. Try to include protein in every meal.
- To keep from feeling full early, avoid liquids with meals or take only small sips (unless you need liquids to help swallow).
- Keep high-calorie, high-protein snacks on hand such as hard-boiled eggs, peanut butter, cheese, granola bars, liquid nutritional supplements, nuts and canned tuna.
- If you are struggling to maintain your appetite, talk to your health care team about whether appetite-building medication could be right for you.

Managing Fatigue

Fatigue (extreme tiredness not helped by sleep) is one of the most common side effects of many cancer treatments. If you are taking a medication, your doctor may lower the dose of the drug, as long as it does not make the treatment less effective. If you are experiencing fatigue, talk to your doctor about whether taking a smaller dose is right for you.

There are a number of other tips for reducing fatigue:

- Take several short naps or breaks during the day.
- Take short walks or do some light exercise, if possible.
- Try easier or shorter versions of the activities you enjoy.
- Ask your family or friends to help you with tasks you find difficult or tiring.

Fatigue can be a symptom of other illnesses, such as anemia, diabetes, thyroid problems, heart disease, rheumatoid arthritis and depression. So be sure to ask your doctor if they think any of these conditions may be contributing to your fatigue.

Managing Pain

To help your doctor prescribe the best medication, it's useful to give an accurate report of your pain. Keep a journal that includes information on:

- Where the pain occurs
- When the pain occurs
- How long it lasts
- How strong it is on a scale of 1 to 10, with 1 being the least amount of pain and 10 the most intense
- What makes the pain feel better and what makes it feel more intense

There are a number of options for pain relief, including prescription and over-the-counter medications. It's important to talk to a member of your health care team before taking any over-the-counter medications, to determine if they are safe and will not interfere with your treatments.

Physical therapy, acupuncture and massage may also be of help in managing your pain. Consult with a member of your health care team before beginning any of these activities.



The Role of Pharmacists in Your Cancer Treatment Journey

Pharmacists are highly accessible members of the health care community. While pharmacists are often employed by independent or chain drug stores, they also work in clinics, hospitals and specialty pharmacies (organizations which manage the dispensing, reimbursement, case management and other services specific to medications for complex or chronic conditions).

Regardless of the type of medicine that a doctor prescribes, pharmacists help people by:

- **Explaining how the medication works.** Your doctor or another member of your health care team may have reviewed the ins-and-outs of the medication when you received your prescription, but hearing the information more than once is helpful—especially at what can be a stressful time.
- **Reinforcing how the medication is to be taken.** For example, some medications should be taken with meals; others should be taken on an empty stomach. If the medication is self-administered via an injection, the pharmacist can explain the proper injection technique.
- **Reviewing what side effects might occur.** This information is provided in the Package Insert (PI) that accompanies the medication, but it can be valuable to hear it explained in everyday language. The pharmacist can also monitor any side effects you may experience and offer guidance (in collaboration with your health care team) on possible ways to relieve the symptoms these side effects may cause.

- **Explaining what your insurance covers.** An insurer may require that the generic version of the drug be dispensed, if one exists. Your pharmacist can help explain any differences between the original drug and the covered drug, including any out-of-pocket cost implications.
- **Ensuring patients take their medication as prescribed.** Pharmacists can provide tips to help you take your medication as prescribed, such as using a pill sorter to stay organized, and signing up for automated refill reminder calls or text messages from the pharmacy. They may also suggest that you download a medication reminder app for use on your smart phone or tablet. Many of these apps are available for free or at a small cost.
- **Recommending financial resources.** There are a number of financial aid organizations and patient assistance programs available to help patients with their out-of-pocket expenses. Your pharmacist can be a good source of information about these resources.



Communicating With Your Health Care Team

As you manage your cancer, it's important to remember that you are a consumer of health care. The best way to make decisions about health care is to educate yourself about your diagnosis and get to know the members of your health care team, including doctors, nurse practitioners, physician assistants, nurses, dietitians, social workers and patient navigators.

Here are some tips for improving communication with your health care team:

Start a health care journal. Having a health care journal or notebook, either on paper or in a digital format, will allow you to keep all of your health information in one place. You may want to write down the names and contact information of the members of your health care team, as well as any questions for your doctor.

Prepare a list of questions. Before your next medical appointment, write down your questions and concerns. Because your doctor may have limited time, ask your most important questions first and be as specific as possible.

Bring someone with you to your appointments or have them be present during telehealth sessions. Even if you have a journal and a prepared list of questions or concerns, it's always helpful to have support during your appointments. The other person can serve as a second set of ears. They may also think of questions to ask your doctor or remember details about your symptoms or treatment that you may have forgotten.

Write down your doctor's answers. Taking notes will help you remember your doctor's responses, advice and instructions. If you cannot write down the answers, ask the person who accompanies you to do that for you. If you have a mobile device, like a tablet or smartphone, ask if you can use it to take notes. Writing notes will help you review the information later.

Record your visit if your doctor allows it. Recording the conversation with your doctor gives you a chance to hear specific information again or share it with family members or friends.

Incorporate other health care professionals into your team. Your medical oncologist is an essential member of your health care team, but there are other health care professionals who can help you manage your diagnosis and treatment:

- Your primary care physician should be kept updated about your cancer treatment and any test results.
- Your local pharmacist is a great source of knowledge about the medications you are taking. Have all of your prescriptions filled at the same pharmacy to avoid the possibility of harmful drug interactions.
- Make sure your oncologist knows of any other medical conditions you have, or any pain you are experiencing, so that they can consult with your primary care physician or your specialist if needed.
- Ask your oncologist to send a summary of your visits to your primary care physician and all doctors involved in your care.

Remember, there is no such thing as over-communication.

CancerCare's Free Support Services and Programs

It can be very difficult to receive a diagnosis of cancer, and adjusting to the necessary changes in your life can be challenging.

CancerCare® can help. We are a national nonprofit organization providing free, professional services to anyone affected by cancer. Our licensed oncology social workers can provide support and education, help in navigating the complicated health care system and offer information on support groups and other resources.

To learn more about how CancerCare helps, call us at 800-813-HOPE (4673) or visit www.cancercares.org.

You will likely also build your own personal support network composed of family and friends. In doing so, it's best to take some time to think about the people in your life and how they are best suited to help. Match the task to their strengths—ask a family member who loves to shop to pick up something for you at the store, or ask a friend who's a good listener to come over for a chat.



Frequently Asked Questions

Q: What is antimicrobial resistance?

A: Antimicrobials—including antibiotics, antivirals and antifungals—are medicines that prevent and treat infections. Antimicrobial resistance (AMR) occurs when bacteria, viruses and fungi (pathogens) change over time and become resistant to these medicines. This makes infections harder to treat and increases the risk of severe illness. Misuse and overuse of antimicrobials are the primary reasons pathogens become resistant to treatment.

For example, antibiotics (a type of antimicrobial) are essential to treat serious bacterial infections, but they are frequently used to treat illnesses that are not caused by bacteria or could get better on their own. Taking antibiotics when not appropriate or necessary encourages harmful bacteria to become resistant. This means antibiotics may not work when they are really needed.

Q: What is sepsis and how is it treated?

A: Chemotherapy-induced neutropenia may lead to an “endogenous” infection, in which the body becomes infected with its own bacteria. If this occurs, the infection can spread through the bloodstream, causing a body-wide infection called sepsis.

The primary treatment for sepsis is a course of antibiotics. For severe sepsis and septic shock (in which dangerously low blood pressure occurs) the antibiotics are often given directly into a vein. Antibiotic treatment should start very shortly after diagnosis to reduce the risk of serious complications.

Q: What is lymphopenia?

A: Lymphopenia is a condition in which a person has an abnormally low level of lymphocytes in their blood. Lymphocytes are a type of white blood cell that fight infection, and people with lymphopenia have a higher risk of developing an infection. The condition can be caused by cancer treatments, including chemotherapy and radiation. Blood or lymphatic cancers such as leukemia and lymphoma can also cause lymphopenia. People with lymphopenia will need treatment for any infections that occur as a result of the condition.

Q: What is a treatment summary and why is important?

A: A treatment summary is a document that you create and keep in your possession. Maintaining your own records allows you and your family members to have instant access to the specifics of your cancer diagnosis and treatment. A treatment summary should include:

- Your name and date of birth
- Date of diagnosis
- Prescribed therapy/therapies, including dates started and stopped and dosages when appropriate
- Dates and types of post-diagnosis testing, and the results of these tests
- Other medications and supplements you are taking
- Names, affiliations and contact information of all members of your health care team

Talk to your doctor or a member of your health care team about your intention to create a treatment summary, and ask what else they suggest be included. Take your treatment summary with you when you visit any doctor, not just your oncologist.



Resources

CancerCare®

800-813-HOPE (800-813-4673)
www.cancercares.org

American Cancer Society

800-227-2345
www.cancer.org

Cancer.Net

Patient information from
the American Society of
Clinical Oncology
888-651-3038
www.cancer.net

National Cancer Institute

800-422-6237
www.cancer.gov

CLINICAL TRIALS WEBSITES**ClinicalTrials.gov**

www.clinicaltrials.gov

EmergingMed

www.emergingmed.com

National Cancer Institute

www.cancer.gov

Cancer Support Community

888-793-9355
www.cancersupportcommunity.org

National Coalition for Cancer

Survivorship
877-622-7937
www.canceradvocacy.org

Medicine Assistance Tool

www.medicineassistancetool.org

This booklet is supported by Pfizer.



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