

HEALTH TIP SHEETS

COMBINED HIGH RISK TIP SHEETS



Understanding Your Risk for Infection During Chemotherapy

What Is an Infection?

It's important for you to understand what an infection is before you learn about the things that might put a person at a higher risk for getting one. An infection occurs when germs enter a person's body and multiply, causing illness, organ and tissue damage, or disease. Some common germs and infections include the following:

Bacteria: Very small microorganisms. Some types of bacteria enter the human body from the air, water, soil, or food, and can cause infections and disease. Common bacterial infections include pneumonia, bronchitis, and ear infections.

Virus: A very simple microorganism that may cause illness or disease. Viral infections are passed on from other people. Common viral infections include the common cold, herpes, and flu.

Your immune system helps your body protect against these germs. Cancer and chemotherapy can damage this system, reducing your number of infection-fighting white blood cells and making it harder for your body to fight infection from germs.

Who Is at Risk?

People receiving chemotherapy may be at risk for getting infections. You are likely to be at higher risk between 7 and 12 days after you have received each chemotherapy treatment – and possibly lasting up to one week, when your white blood cells are at their lowest numbers. This period of time is often called your nadir, meaning “lowest point.” This period varies slightly depending upon the chemotherapy drug, or combination of drugs, used. Your doctor and/or nurse will let you know exactly when your white blood cell count is likely to be at its lowest.

There are certain risk factors that may make it more likely for you to develop serious infections while your white blood cell count is low:

- You are 65 years or older.
- You are female.
- You are unable to take care of yourself without assistance and are bed-bound.
- You have lost a lot of weight in a short time (unintentional weight loss).
- You have another condition that makes it more difficult to fight off infections (i.e., diabetes, kidney disease, high blood pressure, congestive heart failure, an autoimmune disease, liver disease, chronic bronchitis, or emphysema).
- You have a type of cancer that affects the blood or lymph nodes (for example, leukemia).
- Your cancer has spread to other parts of the body.
- You have had chemotherapy or radiation in the past.
- You are receiving more than one chemotherapy drug.
- The chemotherapy that you are receiving is strong.
- Your doctor or nurse has told you that you have a low white blood cell count in the past.

The stronger the chemotherapy, the more of your white blood cells will be killed, making your immune system weaker. Strong chemotherapy may also make your immune system weaker for longer, which also increases your risk for getting an infection.

If you are receiving chemotherapy, you may be at risk for getting an infection. Take the right steps toward preventing infections during cancer treatment by visiting www.PreventCancerInfections.org



Scan And Learn More

What is Nadir?

Chemotherapy treatment will usually involve a number of chemotherapy doses (sometimes called cycles). The period of time beginning 7–12 days after you finish each chemotherapy dose—and possibly lasting up to one week—is when you have the fewest white blood cells in your body. Because of this, it will be extra hard for your body to fight off germs during this time.

This period of time is sometimes referred to as nadir, which means “lowest point”. For example, if you have chemotherapy on August 7, you are at highest risk of picking up an infection between August 14 and August 19. This period varies slightly depending upon the chemotherapy drug, or combination of drugs, used.

What Can You Do During Your Nadir?

- Find out from your doctor and/or nurse exactly when your white blood cell count will be at its lowest.
- Be extra careful during this time.
- Try to remember to take your temperature every evening, and call your doctor if you have a temperature of 100.4°F or higher for more than 1 hour, or a one-time temperature of 101°F or higher.

Talking to Your Doctor or Nurse About Your Risk

Remember, although following these infection prevention steps will help you from picking up germs, no matter how careful you are, you may still get an infection. If you do develop an infection during your chemotherapy treatment, it is important to know that it is not your fault!

To find out more about the risks for getting an infection during your chemotherapy treatment, speak with your doctor or nurse. Below are some questions that you can ask:

- Will the cancer treatment I am receiving make me more likely to develop a low white blood cell count?
- Am I at increased risk for getting an infection because of my medical history or other things?
- If I get an infection, how severe is it likely to be, and how long might it last?
- Will you do anything special to help keep me from getting infections?
- What can I do to lower my risk for infection?
- How will I know if I have an infection?
- What should I do if I think I have an infection?
- If I get a fever (increase in body temperature), does that mean I have an infection?
- How will you decide how to treat my infection?
- What will you do if the treatment does not get rid of my infection?
- What are the likely side effects of the proposed treatments for infection?
- What other factors might increase my chances of getting an infection?

Understanding the Effects of a Low White Blood Cell Count

White Blood Cells

Your body has different types of blood cells that work in a number of ways to keep you healthy. It's important for you to understand how your white blood cells protect you against infection by attacking germs that enter your body. This is why your doctor or nurse will check your white blood cell count throughout your treatment.

Chemotherapy and White Blood Cells

Chemotherapy is a commonly used treatment for cancer. These powerful cancer-fighting drugs work by killing the fastest-growing cells in the body—both good and bad. This means that along with killing cancer cells, your healthy white blood cells, called neutrophils, are killed too.

When the number of neutrophils is reduced, a condition called neutropenia occurs and your risk for getting an infection is increased. Between 7 and 12 days after you have received each chemotherapy treatment—and possibly lasting up to one week, your white blood cells are at their lowest numbers. This period of time is often called your nadir, meaning “lowest point”. This is when you are more likely to develop neutropenia. This period varies slightly depending upon the chemotherapy drug, or combination of drugs, used. Your doctor and/or nurse will let you know exactly when your white blood cell count is likely to be at its lowest.

You should watch very carefully for signs and symptoms of infection during this time. During these high-risk days, you should take your temperature any time you feel warm, flushed, chilled, or not well.

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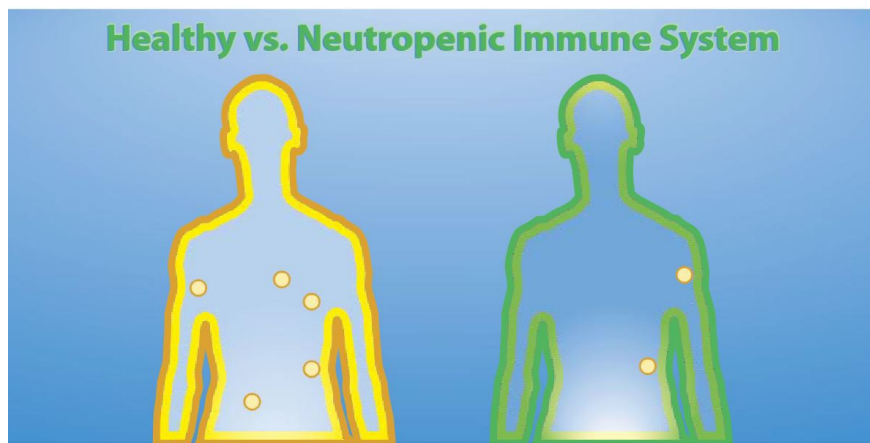
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Low White Blood Cell Count

To help show what we mean, take a look at the picture below. You will notice that the figure on the right features a person who is going through chemotherapy and has fewer white blood cells than the healthy person on the left. As a result, the person on the right has an immune system that is not as strong. This means they are less able to fight against germs that may enter the body and are at higher risk for getting an infection.



If You Have a Low White Blood Cell Count

If chemotherapy is likely to make your white blood cell count very low, you may get medicine to raise your white blood cell count and help lower your risk of infection.

If you have a low white blood cell count, remember that you have a great resource in your doctor or nurse! Be sure to talk to them about ways that you can better cope with low white blood cell counts. They can give you resources and guidance to keep your body as healthy as possible during this time. If you have questions, call your doctor or nurse. They are there to help you.

Remember that when your white blood cell count is low, your body isn't as well equipped to fight off germs. For this reason, it is very important to reduce your risk of infection and familiarize yourself with the signs and symptoms of infection.

Signs and Symptoms of Infection

Fever

Many times, fever may be our body's only sign of an infection. Infections during chemotherapy can be life threatening and may delay future chemotherapy treatments. Because your white blood cell count is low, your body may not be able to fight the infection on its own. This is why it's very important that you call your doctor immediately, even if it is in the middle of the night, if you have a temperature of 100.4°F or higher for more than 1 hour, or a one-time temperature of 101°F or higher.

Monitoring Your Temperature

If your doctor or nurse tells you that you have a low white blood cell count, they will also let you know exactly when it is likely to be at its lowest point. This period is sometimes called the **nadir**.

During these high-risk days, you should take your temperature any time you feel warm, flushed, chilled or not well. However, sometimes you may have a fever without any symptoms. This is why it's important that you take your temperature every night when your white blood cell count is low. A fever is much more likely to happen at night, between 5 p.m. and midnight.

It's also important to do the following:

- Keep a working thermometer in a convenient location and know how to use it.
- Keep your doctor's phone numbers with you at all times. Make sure you know what number to call during their office hours and what number to call after hours. If you have a fever during a time when the office is closed, DO NOT wait until the office re-opens before you call.
- If you have to go to the emergency room, it's important that to tell the person checking you in that you are a cancer patient undergoing chemotherapy. This is because if you have an infection you shouldn't sit in the waiting room for a long time. Infections can get very serious the longer they go untreated.

Additional Signs and Symptoms

While developing a fever is the most serious side effect and should be treated as an emergency, there are several other signs or symptoms you should be aware of that may indicate you have an infection:

- Chills and sweats
- Change in cough or new cough
- Sore throat or new mouth sore
- Shortness of breath
- Nasal congestion
- Stiff neck
- Burning or pain with urination
- Unusual vaginal discharge or irritation
- Increased urination
- Redness, soreness, or swelling in any area, including surgical wounds and ports
- Diarrhea
- Vomiting
- Pain in the abdomen or rectum
- New onset of pain
- Changes in skin, urination, and mental status

If you experience any of these signs or symptoms you should call your doctor immediately

BASIC HYGIENCE PRACTICES

Hand Washing

One of the best ways to keep yourself from getting sick is to keep your hands clean. You should also encourage friends and family members to keep their hands clean. Let's take some time to learn more about when and how to wash your hands.

When to Wash Your Hands

Wash your hands with soap and water:

- Before, during, and after cooking food
- Before you eat
- After going to the bathroom
- After changing diapers or helping a child to use the bathroom
- After blowing your nose, coughing, or sneezing
- After touching your pet or cleaning up after your pet
- After touching trash
- Before and after treating a cut or wound or before caring for your catheter, port or other access device.

How to Wash Your Hands

To avoid getting sick and getting those around you sick, you need to make sure that you are washing your hands the right way.

Step 1: The first step is to wet your hands with clean running water. It doesn't matter if the water is warm or cold, but you want to be sure to apply soap.

Step 2: Rub your hands together until you make suds and scrub them well. Make sure that you scrub the backs of your hands, between your fingers, and under your nails.

Step 3: Continue rubbing your hands together for at least 20 seconds. If you need some help figuring out how long 20 seconds is, hum the "Happy Birthday" song from beginning to end twice.

Step 4: Next, rinse the soap off of your hands under running water.

Step 5: Finally, dry your hands using a clean towel or air dry. And remember, not only is hand washing easy, but it is one of the best ways to help prevent the spread of germs no matter where you are.

Chemotherapy and the Mouth

The medicine that you are taking to treat your cancer has an effect on the way the cells in your body make new cells. When the healthy cells in your mouth are affected, this can lead to a number of side effects.

Tongue: Your cancer medication can reduce the number of infection-fighting cells in your blood for a short period of time, and during this time your body's ability to combat infection may be lowered. Because of this, you are more likely to get an infection in the lining of your mouth. The most common of these infections is a fungal infection called thrush. Thrush usually appears as a white coating in the mouth and on the tongue.

Gums: There are times that the medicine you are taking may cause your gums to become sore and bleed.

Soft palate: Because of your medicine, your mouth may become very sore, causing small ulcers to form. This soreness is called mucositis and can be very painful.

Mouth: Just as your medicine may affect the lining of the mouth, it can also have an impact on the glands that make your saliva. This can cause you to have dry

Keeping Your Mouth Healthy

There are a number of things that you can do to keep your mouth healthy:

- Brush your teeth and clean your dentures when you wake up, before you go to bed, and after every meal.
- Use a soft toothbrush.
- Get a new toothbrush every 3 months.
- Use the mouthwash your doctor or nurse recommends to avoid getting mouth sores. If you do develop mouth sores, speak to your doctor about whether to substitute mouthwash for salt or plain water mouth rinses, as this will cause less discomfort.
- Check with your doctor or nurse before flossing your teeth because your chemotherapy may increase your chances of bleeding when you floss.
- Avoid using toothpicks.
- Try to stay away from things that may irritate your mouth: alcohol, tobacco, spicy food, garlic, onion, vinegar, crunchy foods, and acidic drinks (e.g., orange and grapefruit juice).
- Keep your lips moist by using lip balm.
- Try to drink at least eight glasses of fluid a day.
- Check your mouth daily for redness, swelling, sores, white patches, or bleeding, and let your doctor or nurse know if any of these signs of infection are present.
- Check with your doctor or nurse before having any dental work done.

Skin Changes

The medicines that you take to treat your cancer may cause your skin to change in a number of ways. These changes, like dry skin and irritation, can lead to openings in the skin where germs can enter and infection can set in. A few changes to your daily hygiene routine as soon as chemotherapy begins and throughout your treatment can help to keep your skin healthy and lower your risk for infection. An important part of this routine is bathing.

Skin Care and Bathing

Following the tips below will help protect your loved one's skin from damage and infection:

- Bathe every day and use warm water.
- Avoid soaking in spas or hot tubs.
- Use a mild soap for bathing.
- Use a soft towel to gently wash skin.
- Be sure to clean feet, groin, underarms, and other sweaty areas well.
- Do not rub skin with the towel, instead pat it dry.
- Do not share bath towel with other family members.
- Use unscented lotion or moisturizing cream on skin after it has dried completely.

Protecting Skin From Cuts and Scrapes

While you are going through chemotherapy, your body will not be able to fight germs off as well as it normally would. At every step of your treatment, it is important to protect yourself from getting an infection. One of the ways you can do this is by protecting your skin from cuts and scrapes because these are easy ways for germs to enter your body.

Protecting Skin From Injury and Infection

If you follow a few simple steps you can protect yourself from injury and infection:

- Use an electric razor instead of a blade when shaving to prevent nicks.
- Be careful when handling sharp items.
- Wear gloves when gardening to protect your hands from cuts and scrapes.
- Use caution when exercising to avoid grazing or scraping your skin.
- Use caution when walking on wet or slippery surfaces to avoid falling and scraping your skin.
- Do not cut, tear, or bite cuticles.
- Avoid manicures and pedicures.
- Do not squeeze or scratch pimples.
- Wear clothing that is appropriate for the type of activity you plan to do (for example, wearing long sleeves and gloves when gardening).

Wound Care

As we discussed before, infection is what can happen when germs enter your body. One of the many ways that germs can make their way in is through a break in your skin like a cut or scrape. Because of your cancer and some of the medicines you are taking, it is important to take care of these wounds properly before they become a serious problem. Although there are things that you can do to lower your chance of getting a cut or a scrape, accidents happen. If you scrape your skin or get a minor cut, follow these simple steps to lower your risk for getting an infection:

- Step 1: Wash and dry your hands with soap and water.
- Step 2: Place the wound under running water to rinse out any dirt. Any large debris can be removed using a clean pair of tweezers.
- Step 3: Wash the skin around the cut with warm soap and water and apply antibiotic cream.
- Step 4: Use an adhesive bandage to cover the wound. You may also use gauze and hypoallergenic tape to cover the wound if your skin is sensitive.
- Step 5: Change the bandage daily, or if it becomes wet or dirty.

Wound Care: When to Call Your Doctor or Nurse

Any time your loved one changes a bandage he or she should check for signs of infection. Call the doctor or nurse, if you or your loved one notices any of the following:

- Drainage, especially if it is yellow in color
- Odor coming from the wound
- Redness in skin around the wound
- Swelling of the skin around the wound
- Pain or tenderness

FRIENDS, FAMILY , AND PUBLIC PLACES

Crowds and Public Places

When undergoing chemotherapy, if you feel up to it, it is generally fine to visit public places. Just remember your immune system is weaker than usual and it may be harder for your body to fight off infections. If you do go out, try to avoid situations where you might come into close contact with people who may be sick. For example, eating at a restaurant or going to a movie is OK, but you should try to avoid a situation where you are in a crowd.

This is especially important:

- Between 7 and 12 days after receiving each chemotherapy treatment—and possibly lasting up to one week— (sometimes called the nadir) when your immune system is likely to be at its weakest and you are at the greatest risk for picking up germs. Be sure to ask your doctor or nurse when your immune system is likely to be at its weakest.
- During cold and flu season, when more people are sick.

To further protect yourself, you should wash your hands or use hand sanitizers when you return home to get rid of any germs you might have picked up.

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Spending Time With Friends and Family

Your friends and family are a big part of your support system, and spending time with them is important. Keep in mind that unless a friend or family member is sick or highly contagious, most doctors and nurses agree that the benefits of spending time with your friends and family outweigh the risks.

To help prevent you from picking up germs, you can ask friends and family to wash their hands when visiting you. You can also consider keeping hand sanitizer at home and asking family members and visitors to use it.

MEDICATION

Taking Your Medication as Prescribed

Your doctor has developed a plan to treat your cancer and help you feel better. The doctor may prescribe one or more medications to help with your cancer treatment.

Whether you receive treatment or medicine in a hospital, clinic, or at home, it is important to follow the tips below to ensure that your treatment is carried out as intended:

- Take your medication exactly as your doctor tells you or prescribes.
- Do not skip a dose.
- Do not run out of your medicine. Call your pharmacy when you notice that you are running low on your medication and need a refill. Call your health care provider if you notice your refills are almost up.
- Never take medicine that is prescribed for someone else, even if it is the same type and dose as yours.
- Do not use leftover or outdated medicine.
- Report any side effects that you may experience right away.
- Talk to your doctor before taking any over-the-counter medicine that was not prescribed or suggested by your doctor.

Treating a Low White Blood Cell Count

If your doctor or nurse tells you that you have a low white blood cell count, they may also talk to you about starting a type of medication to boost the number of white blood cells in your system. This may help lower your risk of infection.

VACCINATIONS AND THE FLU

Flu Symptoms

The “flu” is a term used when talking about a number of different influenza viruses. Because you have cancer, you are at a higher risk for getting complications from the flu (which could result in a hospital stay). Flu-like symptoms can also be a sign of an extremely serious infection that is not the flu and could result in a hospital stay or even death.

If you get any of the following sign or symptoms, call your doctor immediately:

- Temperature of **100.4°F or greater**
- Headache
- Body aches
- Chills
- Fatigue
- Cough
- Sore throat
- Runny or stuffy nose
- Vomiting
- Diarrhea

The Flu Vaccine

It is common for people getting chemotherapy to have a weakened immune system. The Centers for Disease Control and Prevention (CDC) recommends that people with cancer get the seasonal flu shot as soon as it is available. This will help you to avoid getting the flu. Talk to your doctor or nurse about when to get a flu shot.

Here are a few more things you can do to protect yourself against getting the flu:

- Be sure to ask for the seasonal flu shot, not the nasal spray flu vaccine. The flu shot is made up of inactivated viruses (killed) and the nasal spray vaccines are made up of live viruses. The flu shot is safer for those with a weakened immune system.
- Ask your doctor if you should also get a pneumococcal pneumonia shot. The flu can lead to more serious conditions, such as pneumonia, which can be life threatening to persons with a weakened immune system. This shot will protect against certain types of pneumonia and meningitis.
- Develop good health habits to stop the spread of germs.
- Cover your nose and mouth with a tissue when you cough or sneeze. Throw the tissue in the trash after you use it.
- Wash your hands often with soap and water. If soap and water are not available, use an alcohol-based hand sanitizer.
- Avoid touching your eyes, nose, or mouth. Germs spread this way.
- Try to avoid people who appear sick.
- Avoid crowds. (If you do go out, try to avoid situations where you might come into close contact with people who may be sick. For example, eating at a restaurant or going to a movie is OK, but you should try to avoid a situation where you are in a crowd.)

Flu Treatments

If you start to have flu-like symptoms, the following tips may be helpful:

- Contact your doctor or nurse IMMEDIATELY (within the hour) and follow his or her instructions. Flu-like symptoms can be a sign of a very serious infection that is not flu but that could result in hospitalization or even death.
- Take flu antiviral drugs if your doctor prescribes them.
- If you need to go to the doctor's office or emergency room, it is VERY IMPORTANT to let the staff know right away that you are undergoing chemotherapy and think you may have the flu. This is because flu-like symptoms can also be the sign of a serious infection and you shouldn't sit in the waiting room for a long time. Infections can get very serious the longer they go untreated.
- Check with your doctor before taking any medicine. This includes acetaminophen (such as Tylenol®), or ibuprofen (such as Advil®).
- Cover your mouth with a tissue when you cough or sneeze
- If your doctor diagnoses you with the flu, you should:
 - Try to stay home and away from others as much as possible to keep from making them sick (at least 24 hours after your fever is gone). This means that you may have to stay home from work or school, cancel travel plans, and avoid shopping and social events. This does NOT include going out for medical care or other necessities.

FOOD AND KITCHEN SAFETY

Preparing Your Meals

During your chemotherapy treatment, you may have a poor appetite or not feel up to eating. But you should try and eat what you can because good nutrition can help give your body the strength it needs to repair itself. It is also important to drink plenty of fluids throughout the day to stay hydrated.

Because your cancer and chemotherapy may make it harder for your body to fight off infections, it is good practice to follow proper food preparation and handling techniques. Most people follow these anyway, but they are really important at this time.

There are a number of things that can be done in the kitchen to lower your chances of getting sick from the food that you eat:

- Wash your hands with soap and water before handling food.
- Clean your countertops with a disinfectant, such as Lysol®.
- Rinse fruits and vegetables well to remove any germs, and peel them if necessary.

- Prepare raw meat and vegetables on different cooling surfaces.
- Thaw meat in the microwave or refrigerator.
- Clean any surfaces that you used to prepare meat well.
- Cook meat and eggs all the way through to kill any germs.
- Refrigerate leftovers promptly to prevent germs from growing.
- Eat refrigerated leftovers within 24 hours of preparation

Foods to Avoid

Just as there are things you need to keep in mind when preparing your food, there are things that you need to be aware of when choosing the types of food you plan to eat. Remember that your cancer, or the medicine that you are taking to treat your cancer, may increase your risk for infection.

To protect yourself, avoid the following:

- Undercooked or raw meat or eggs.
- Raw or unpasteurized products (check the label on the dairy products you buy such as milk and cheese and fruit juices, to ensure they are pasteurized). Raw and unpasteurized products contain bacteria that may cause you to become ill.
- Unwashed fruits or vegetables.

GARDENING AND HOUSEKEEPING

Gardening

During your nadir, the period of time beginning 7–12 days after you finish each chemotherapy dose—and possibly lasting up to one week—is when you may be at the greatest risk for infection. During this time you should consider avoiding gardening. At other times during your cancer treatment, gardening is a good way to get outside for some fresh air. Many people find gardening relaxing and enjoyable.

Here are a few things you should consider when gardening:

- Wearing gardening gloves can protect your hands and help to avoid cuts and scrapes. Be especially careful around roses or other plants with sharp thorns. Your skin is your first defense against infection, and any breaks in the skin create an opportunity for germs to enter your body.
- Wearing gardening gloves also protects your hands from direct contact with soil, which can contain bacteria and mold. After gardening, be sure to wash your hands with soap and water.

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Housekeeping

Keeping up with your household chores is always a challenge. It can be even harder when you are not feeling well. If possible, don't do household chores if you don't feel well. It is better to rest if you are tired or not feeling well, as this will help your body recover from chemotherapy. If you do want to do housekeeping, there are a couple of easy tips you can follow to keep your house clean and lower your chance of picking up germs

Disinfecting

Try and keep all your household surfaces clean. You can use disinfectants, such as sprays and wipes, to kill germs on the following places:

- Kitchen counter tops and floors, especially before and after food preparation
- Refrigerator door handles
- Telephones
- Door knobs and handles
- Bathroom counter tops and floors

CARING FOR YOUR PET

Germs and Your Pet

Pets can be a great source of joy, laughter, excitement, and unconditional love. For some owners, pets are considered a part of the family. Studies have shown that pets can reduce stress and anxiety, and can help improve your overall mood.

Normally, your immune system makes sure that germs carried by your pet do not make you sick, but when you are undergoing chemotherapy, your immune system is weaker than usual. During this time, there are a few things to consider when caring for your pet.

Caring for Your Pet

These steps may help prevent germs carried by your pet from entering your body through scratches on your skin or through contact with your mouth (either directly or indirectly from your hands).

- Protect your skin from direct contact with pet bodily waste (urine or feces) by wearing vinyl or household cleaning gloves when cleaning up after your pet. Wash your hands immediately afterwards.

- Cover your hand with a plastic bag or vinyl or household cleaning glove to pick up waste when walking your dog and wash your hands thoroughly as soon as you return home.
- Keep your cat's litter box away from eating areas. If possible, have someone else change the litter pan. If you must change the litter, wear vinyl or household cleaning gloves, and wash your hands immediately afterwards.
- Wash your hands with soap and water after playing with or caring for pets, especially before eating or handling food.
- Avoid being scratched or bitten by your pet. If you do get scratched or bitten, immediately wash the wounds well with soap and water.
- Stop your pet from licking your mouth or any open cuts or wounds you may have.
- Keep your pet clean and take your pet to the veterinarian for regular check-ups and vaccinations.

During your nadir, the period of time beginning 7–12 days after you finish each chemotherapy dose—and possibly lasting up to one week—is when you may be at the greatest risk for infection, you should avoid cleaning up after your pet, if possible. During this time, you might ask a friend or relative to take over these chores.

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- Be extra careful during this time.
- Try to remember to take your temperature every evening, and call your doctor if you have a temperature of 100.4°F or higher for more than 1 hour, or a one-time temperature of 101°F or higher.

CARING FOR YOUR CATHETER

About Catheters

Just as other medicines can be taken in various forms, the same is true for chemotherapy. People with cancer sometimes require that tubes be placed into their body. This is so that they can receive medications directly into the blood stream through a vein (intravenously). These tubes may be under the skin or outside the skin.

Types of Catheters

A catheter is a soft, thin tube that a surgeon inserts into a large vein, often in your chest area. Some catheters stay in place until all your chemotherapy treatments are finished. There are a few different types of catheters, but fall under two main categories: sticking out of the skin (external) or under the skin (subcutaneous).

Out of the skin (external): One end of a thin, flexible plastic tube is inserted into a large vein. The other end of the tube comes out of the skin. These are sometimes called a PICC line (percutaneously inserted central catheter). Medications are injected into this end of the tube.

Under the skin (subcutaneous): A line that is implanted entirely under the skin is usually referred to as a port-a-cath or a medi-port. These lines are usually placed in the chest, but may sometimes be placed in the arm. If you have this type of catheter, it may be connected to a small, round disc made of plastic or metal, called a port, which is also placed under your skin. Your nurse can insert a needle into your port to give you chemotherapy. This needle is often left in place for chemotherapy treatments that last for more than one day

Caring for Your Catheter or Port

Your doctor or nurse will provide detailed instructions on how to care for your central venous access device. To lower the chance of developing an infection:

- Follow your nurse or doctor's instructions.
- Keep the device clean and dry and wash your hands before touching or caring for your device.
- Contact your doctor or nurse immediately if you notice any of the following near your device because any of these could be a sign of an infection:
 - Redness
 - Swelling
 - Soreness
 - Any drainage (including pus)