

Basic Hygiene Practices During Chemotherapy

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.

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 mouth.

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).

More Tips for Keeping Your Mouth Healthy

Here are some additional things that you can do to keep your mouth healthy:

- 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, Skin Care and Bathing

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 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, Scrapes, Injury and Infection

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.

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.

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- 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).

When to Call Your Doctor or Nurse

Any time you change a bandage you should check for signs of infection. Call the doctor or nurse if you notice 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

Caring for Children With Cancer

What You Should Know

It is normal for parents who are caring for a child with cancer to feel scared and nervous. But with planning, you can help your child through his or her treatment, and watch your child return to a normal life. Knowing the signs and symptoms of an infection and knowing the steps you can take to prevent infections may help make this challenging time easier to get through.

This Health Tip Sheet will give you some important information that will help you take care of your child. The other Tip Sheets will give you helpful information as well.

Chemotherapy and Infection

Chemotherapy is the most commonly used treatment for childhood cancers. These powerful cancer-fighting drugs work by killing the fastest-growing cells in the body—both good and bad. That means that along with killing cancer cells, healthy white blood cells called neutrophils often get destroyed too. When the number of white blood cells is reduced, a condition called neutropenia occurs and can increase your child's risk for getting an infection. This is a common and serious side effect of cancer treatment.

Since the length of time it takes your child's blood counts to drop depends on the dose and type of drug used, you should talk to your child's doctor about when they are likely to be at an increased risk for infection.

When caring for your child, it is important to do the following:

Take your child's temperature if he or she feels warm, has the chills, or does not look or feel well.

Treat a fever as a medical emergency. A fever may be the only sign of infection your child will experience. Call his or her doctor immediately if they develop a fever, even in the middle of the night. Do not wait for the office or clinic to open.

Know the other signs or symptoms of infection and call your child's doctor immediately if he or she is experiencing any of these signs or symptoms. Take steps to lower your child's chances of getting an infection.

Fever

A fever is an oral (by mouth) temperature of 100.4 degrees Fahrenheit (38.0 degrees Celsius) or higher.

Other Signs and Symptoms of Infection

While monitoring your child for a fever is important, there are several other signs or symptoms you should know about that may mean your child has an infection, including the following:

- Chills and sweats
- Shortness of breath
- Stiff neck

- Runny or stuffy nose
- Change in cough or a new cough
- Sore throat
- Earache
- Headache

Additional signs and symptoms that may mean your child has an infection include:

- Burning or pain when using the bathroom
- Increased urination
- Stomach pain
- Loose bowels/diarrhea
- Vomiting
- Changes in skin (e.g., blisters, rash, skin sores); check your child's skin and mouth daily
- Sores or pain around the rectum
- Redness, swelling, pain, or pus at the site of a surgical wound or central venous access device (central line or port)
- New onset of pain
- Change in mental status (e.g., confusion, depression)

Children who receive chemotherapy can be at high risk for getting a serious infection. If this happens and your child does not receive medical care right away, your child could get very sick and may even be at risk for dying. If any of the above signs occur, contact your child's doctor or nurse immediately. Do not wait until their office or clinic is open.

Preventing Infections

Keep in mind that playing with friends, attending school, and other daily activities, such as sports are a big part of your child's life. How soon your child should resume these activities after chemotherapy should be discussed with your child's doctor.

Over the next few pages, there are some steps you should take to lower your child's risk for picking up an infection:

- Encourage your child to wash his/her hands often to prevent the spread of germs from one person to another. You and other family members should also wash your hands regularly. Hand washing is the most important way to prevent infection. If soap and water are not available, you may use hand sanitizer.
- Encourage your child not to use cups, eating utensils, or toothbrushes used by others.
- Encourage proper mouth care. Have your child brush his or her teeth with a soft toothbrush after waking up in the morning, before going to bed at night, and after eating meals.
- Help your child avoid contact with other children and adults who have infections such as colds, diarrhea, flu, chicken pox, or shingles.
- Your child should not receive any live virus vaccine, such as oral polio or the mumps, measles, rubella vaccine (MMR), or varicella vaccine (the chicken pox vaccine) while on treatment. Live vaccines can cause illness, as your child's body cannot get rid of the viruses. Your child's healthcare provider should advise about vaccinations and what is safe to receive. To be safe, talk to your child's healthcare provider about

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vaccinations that your other children or family members should receive.

- It is important that your child receives an annual flu vaccine, as should his or her close contacts, including the other members of your immediate family. 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.
- Talk to your child's doctor before taking them to the dentist

More Tips on Preventing Infections

Here are some additional steps you should take to lower your child's risk for picking up an infection:

- Discuss your child's condition, treatment and infection risk with school personnel.
- Discuss international travel plans with your child's doctor.
- Check with your doctor before letting your child use a swimming pool or hot tub.
- Try to stop your child from playing with toys that have come into contact with other children. Regularly wash soft toys and security blankets in the washing machine, and wipe down other toys to keep them clean.
- Do not feed your child raw or undercooked meat or eggs.
- As a caregiver, you should avoid artificial nails.

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:
 - Redness
 - Swelling
 - Soreness
 - Any drainage (including pus)

Any of these could be the sign of an infection.

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.

Are there certain days I'm more at risk than others?

During your nadir, the period of time beginning about 7–12 days after you finish each chemotherapy dose—and possibly lasting for 5–7 days—is when you may be at the greatest risk for infection. During this time, try to avoid cleaning up after your pet by asking a friend or relative to take over these chores

Effects of a Low White Blood Cell Count During Chemotherapy

White Blood Cells Protect You

Watch this video of how white blood cells protect against infection by attacking germs that enter your body.

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 7-12 days after you finish each chemotherapy dose—and possibly lasting for 5-7 days, 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.

How Chemotherapy Affects Your White Blood Cells

Watch this video that shows what happens when the number of white blood cells is reduced (a condition called neutropenia)

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.

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:

During cold and flu season, when more people are sick.

During your nadir, the period of time beginning about 7-12 days after you finish each chemotherapy dose-and possibly lasting for 5-7 days-is when you may be at the greatest risk for infection.

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.

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.

Gardening and Housekeeping

Gardening

During your nadir, the period of time beginning 7–12 days after you finish each chemotherapy dose—and possibly lasting for 5-7 days—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.

Housekeeping and Disinfecting

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.

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

Medication Tips During Chemotherapy

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.

To help strengthen your immune system during chemotherapy, your doctor may also prescribe medicine that will help your body make more white blood cells. The medicine may shorten the duration of your nadir.

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.

Neutropenia and Nadir

WHAT IS NEUTROPENIA?

Neutropenia, pronounced noo-troh-PEE-nee-uh, is an abnormally low number of white blood cells (neutrophils). These cells are the body's main defense against infection. Neutropenia is a common side effect of chemotherapy treatment and increases your risk for infections. If you have neutropenia, doctors will sometimes refer to this as having a "low ANC," or absolute neutrophil count.

WHAT IS NADIR?

Nadir is a term that basically means low point. When a person with cancer reaches their "nadir" following each chemotherapy cycle, it means that the person's blood cell counts are the lowest they will be during that treatment cycle. Each chemotherapy treatment comes with a nadir period.

While the term nadir is used in reference to all blood cell counts, the concern during nadir is the drop in white blood cells, since they help your body fight infection.

After the nadir, your blood cell count will start to rise, decreasing the risk of danger and recovering to a safe level before your next treatment. Your next dose of chemotherapy will only be given after your blood counts have left the nadir and recovered to a safe level.

WHAT HAPPENS DURING MY NADIR?

If you're in your nadir period, the good news is that you just completed another round of chemotherapy and are one step closer to having this behind you. However, you may be more likely to develop an infection during your nadir because your body's first line of defense (white blood cells) will be at its lowest point. You should carefully watch for signs and symptoms of infection during this time.

You can also take extra precautions to prevent infections, like washing your hands regularly and staying away from sick people.

To help strengthen your immune system during chemotherapy, your doctor may prescribe medicine that will help your body make more white blood cells. The medicine may shorten the duration of your nadir.

HOW DO I KNOW WHEN MY NADIR IS?

Your doctor or nurse will tell you. Chemotherapy treatment will usually involve a number of doses (sometimes called cycles). In general, starting approximately 7-12 days after each chemotherapy dose, and lasting for 5-7 days, the number of white blood cells in your body will be at its lowest.

For example, if you have a dose of chemotherapy on August 7, you are at highest risk of getting an infection between August 14 and August 19. This period varies slightly depending upon the chemotherapy drug, or combination of chemotherapy drugs, given.

WHAT CAN I DO?

- Find out from your doctor and/or nurse exactly when your white blood cell count is likely to be at its lowest and ask for their advice on the steps

Neutropenia and Nadir

you can take to avoid picking up an infection.

- Wash your hands regularly and try to avoid situations where you may come into contact with people who are sick.
- Take your temperature any time you feel warm, flushed, chilled, or not well, and call your doctor or nurse immediately if you have a temperature of 100.4°F (38°C) or higher.
- Call your doctor immediately if you develop a fever or are not feeling well.
- To find out your risk for developing a low white (neutropenia), take our short Risk Assessment Quiz.

Signs and Symptoms of Infections During Chemotherapy

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 (38°C) or higher.

You should also be sure to do the following:

- Keep a working thermometer in a convenient location and know how to use it.
- Take your temperature any time you feel warm, flushed, chilled, or not well.
- Be aware of when you are likely to be at highest risk for infection due to a low white blood cell count. Your doctor and/or nurse will let you know when your white blood cell count is likely to be at its lowest. This period is sometimes referred to as the nadir, which means "lowest point". During your nadir, the period of time beginning 7-12 days after you finish each chemotherapy dose-and possibly lasting up to 5-7 days-is when you may be at the greatest risk for infection.
- 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 reopens before you call.
- If you have to go to the emergency room, it's important that you 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 other signs and 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

Signs and Symptoms of Infections During Chemotherapy

- 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.

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.

It's also important for you to know that an infection can lead to a potentially life-threatening complication called sepsis. It's very important to call your doctor immediately if you get an infection or develop any other signs or symptoms of an infection.

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 7-12 days after you have received each chemotherapy dose—and possibly lasting for 5-7 days, 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. 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.

Understanding Your Risk for Infection During Chemotherapy

- Your doctor or nurse has told you that you have a low white blood cell count in the past.

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?

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 (38°C) or higher
- 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 additional 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.

Vaccinations and the Flu

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.