New Patient Chemotherapy/ Immunotherapy Guide

FLORIDA CANCER SPECIALISTS
& Research Institute

My Personal Information

Physician Name: ____

Office phone number: ____

WHEN TO CALL THE OFFICE

Please do not hesitate to call the office if you have questions, concerns or if you are experiencing any of the symptoms discussed in this guide. If you call after business hours, we have a call service that will take a message and contact the physician on call. Our physicians will return calls after hours for emergency problems, such as fever, uncontrolled pain or new onset symptoms that are severe.

Contact office immediately for any of the following:

Temperature greater than 100.4°

Excessive bruising

Bleeding that will not stop

Nausea and vomiting lasting more than 24 hours

Diarrhea lasting more than 24 hours

Severe/sudden onset of new pain

Change in mental status

Contents

About this guide

This is your guide to treatment. In it, you will find information on common side effects and how to manage them. You will also find information on what symptoms or side effects to look for and when to call your physician if there are problems. If you have any questions after reading this information, please talk with your healthcare team.

Preparing for Your First Day of Treatment

Ask your physician about whether you need to address any of these things prior to starting treatment:

- Do you need to see a dentist?
- Do you need to get a hearing or vision test?
- Does your treatment require that you see a heart doctor?
- Will you need a port or PICC line for treatment?
- Do you need to see a fertility doctor about fertility planning? This should be discussed if you want to have children after treatment is complete.
- Should you get vaccines for flu, COVID-19, pneumonia, chicken pox/shingles, etc.?

Be sure to write down any questions you have, so you can talk with your physician or nurse to get the answers you need.

Please be aware this booklet is for general knowledge only. It does not replace talking with your healthcare team. If you have any questions about your treatment or side effects, please call your doctor or nurse.

Quick Tips During Treatment

- Listen to your body – There are many changes that can happen during treatment. Make sure you are talking with your healthcare team at every appointment so we can help you with any issues. You can find information on side effects and nutrition later in this booklet.
- Stay connected and let others help. Hopefully, there will be family and friends, or even church groups, who will be happy to help you with transportation, housework, yardwork or preparing meals. Let them help and keep them close. You will likely need some assistance before treatment is complete, even if you feel great in the beginning.
- Stay on schedule - You will be given a schedule for your treatments when you arrive for your first visit. The times are flexible, but you will want to do everything you can to keep your appointments. If you are not feeling well, please come to the appointment to see your doctor. If you miss an appointment, please make sure that it is rescheduled as soon as possible. Lab work will be done before your treatment and, if it is acceptable, you will proceed with your treatment.
- Drink plenty of fluids – It is very important that you stay hydrated while on treatment. The extra fluids will help rid your body of the toxins that are released as a result of your treatment. The more water you drink, the better you are likely to feel between cycles. You should be getting at least two to three liters of non-caffeinated beverages (water is preferred) each day, unless previously informed otherwise by medical professionals
- Stay active, but pace yourself – Light exercise will keep your spirits up and help with your sleep patterns; however, it is important to listen to your body and rest when necessary. You can find more information on activity during treatment later in this booklet.
- Take care of yourself – It is important that you put yourself first while you are getting treatment. Try to do the things you need before you do things for others. Again, let others help you when needed.

What is Cancer?

Normal/healthy cells divide as the body needs them. They stop dividing when they start touching like cells and they die at the end of their life cycle.

Cancer cells do not behave in this way. They often continue to divide and crowd out the normal cells of the body and they do not die. This is how tumors start to grow.

- Most cancers are named for the area of the body where they begin.
- When cancer spreads to other areas of the body, it is called metastasis.
- Treatment depends on the type of cancer and the stage of the disease.
- There are four stages of cancer. Stage I (one) cancer typically means the cancer is small and localized to one area, and that it has not spread to the lymph nodes or other parts of the body. Stage IV (four) cancer is when the cancer has spread to other areas of the body; Stage IV is often called metastatic disease.

How is cancer treated?

- Local therapy - removes or destroys cancer in just one part of the body.
- Surgery - you may see a surgeon before or after chemotherapy, depending on the plan of care.
- Radiation therapy – you may see a radiation oncologist for radiation treatments before, during or after chemotherapy.
- Systemic therapy – destroys cancer cells throughout the body. These medications are given and travel to every area in your body to best treat your cancer.
- Chemotherapy – information in next section.
- Hormone therapy – some patients may be treated with hormone therapy. This type of therapy is only effective if your cancer cells are hormone receptor positive. Your physician will discuss this with you if it is something that you will need.
- Immunotherapy/targeted therapy – see page 20
- Biosimilars – see page 22

Questions and Answers About Chemotherapy

What is Chemotherapy?

Chemotherapy (also called chemo) is a type of cancer treatment that uses drugs to destroy cancer cells.

How does chemo work?

Chemo works by interrupting the growth of cancer cells, which grow and divide quickly. Most chemo drugs do not know the difference between the normal cells and the cancer cells. They often affect the cells of your body that reproduce the fastest, such as those that line your mouth and intestines or cause your hair to grow. Damage to healthy cells may cause side effects. Often, side effects get better or go away after chemotherapy is over.

What is the goal of chemo?

Depending on the type of cancer you have and how advanced it is, there are different goals for chemo treatment:

- Cure – if cure is the goal of treatment this means that the cancer cells will be killed to the point of being undetectable.
- Control – a goal of control means that the treatment is expected to prevent the cancer from growing or spreading to other areas of the body.
- Palliative – this type of treatment helps to protect and preserve or even regain (in some cases) your quality of life.

How is chemo used?

Chemo can be used alone or with other treatments, such as surgery or radiation therapy. It is given at different times depending on the goal of treatment.

- It can be used to help shrink the size of a tumor before surgery or radiation (neo adjuvant therapy).
- It can be used after surgery or radiation to kill cancer cells that may remain in your body (adjuvant therapy).

- Sometimes it is used at the same time with radiation or biologic therapy to make the treatment more effective (concurrent treatment).
- Additional treatment with chemo may be needed if cancer returns (recurrent cancer) or to treat cancer that has spread to other parts of your body (metastatic cancer).

How does my physician decide what chemo drugs to use?

There are many different chemo drugs. They can be used alone or combined. Some are used for many types of cancer and others may only be used for one or two types. The decision is made depending on several things:

- What type of cancer are we treating?
- What is the general health of the patient? Are there other health problems that need to be considered?
- Has the patient had chemo in the past?

How often will I have to have chemo?

Treatment varies for every patient. Some patients are treated weekly and others receive treatment every two, three or four weeks. Your schedule will depend on what type of cancer you have, what the goal of treatment is and how your body reacts to treatment.

Chemo is ordered in cycles. A cycle of treatment is a period of chemo followed by a period of rest. For instance, you may have a chemo treatment one week, followed by a week of rest. These two weeks will be one cycle of chemo. The rest period gives your body time to recuperate and allow your healthy cells to rebuild.

Can I miss a cycle of chemo?

It is not a good idea to miss a treatment; however, sometimes your doctor will adjust your treatment schedule based on how you are feeling and the side effects of treatment. If this happens, the doctor/nurse will discuss this with you and explain the change. They will also review when they plan to move forward with the next treatment cycle.

How is chemo given?

Chemo can be given several ways.

- Intravenous (IV) – is given directly into a vein.
- Injection – this is a shot into a muscle or the fatty tissue just under the skin.
- Orally – many chemo drugs come in a pill form that can be taken at home. While this can be more convenient than other forms, it is very important that you stay on schedule if this is how you will be getting your chemo. Make sure that you understand exactly how and when to take your oral medications.
- Topically – some chemo drugs come in a cream that you apply to your skin.
- Intraperitoneal (IP) – this chemo goes directly into the peritoneal cavity (the area that holds your organs in your abdomen, such as your intestines, stomach, and liver).
- Intra-arterial (IA) – a form of chemo that is put directly into the artery that feeds blood to your cancer.
- Intrathecal (IT) – some chemotherapy drugs can go directly into the cerebrospinal fluid to kill cancer cells.

Intravenous chemo is the most common way to get treatment. It can be given through an IV in your arm or a port-a-cath (port) placed into your chest by a surgeon. Your surgeon will give you instructions for post-op care of your port incision. On treatment days, we access the port with a special needle and can give medication through it that cannot be given through a regular IV. We can also draw blood from your port on treatment days. On days you do not have treatment, your labs may be drawn from your port or your arm.

When treatment is completed, the needle will be removed. We will cover the area with a band aid. Please remove the band aid when you get home.

If you are not having a port placed, we will do our best to place an IV in a place that is easy. We try to stay away from joint areas of your wrist and elbow.

Occasionally, a Peripherally Inserted Central Catheter (PICC) is placed in the upper arm and can be used for many weeks in a row for treatment.

Ports and PICCs can be a source of infection for you, so please keep the area clean and dry and follow all instructions from your surgeon and nurse after placement.

Sometimes chemo is put into a pump that you take home with you. If your treatment requires this, your physician and nurse will go over what to expect and how to proceed.

How will I feel during chemo?

Chemo affects people differently. There is no way for your healthcare team to know exactly how you will react to the chemo. How you react will depend on how healthy you are before chemo, how well you hydrate and eat, and the amount of rest you get. Side effects usually appear about 24-48 hours after treatment; however, they can start right after chemo.

The most common side effect is fatigue. We encourage every patient to have someone to drive you to and from treatment, especially for the first treatment. Make sure you make time to rest and use the help that is offered by friends and family.

Will I be able to work during chemo?

Many people can continue to work while getting chemo, depending on the type of work they do. Talk with your healthcare team about whether you will be able to work.

Can I take over-the-counter and prescription medication while on chemo?

You will likely be able to continue with your regular prescribed medications during chemo; however, always discuss what you take with your healthcare team. Make sure that you tell your doctor about all medications you take, including laxatives, allergy medications, cold medicines, pain relievers, ibuprofen or aspirin. Some prescription and over-the-counter drugs can affect the way chemo works in your system and you may need to stop taking them. Please bring either the pill bottles or a list of your medications to all appointments. We will need to know the name of each medication, why you take it, how much you take and how often you take it.

This is also true for any herbs, minerals, vitamins or dietary supplements. Please do not start taking anything new without discussing it with your physician.

How will I know if the chemo is working?

Your physician will see you regularly to assess how you are doing. He/she will also order blood tests and may order scans or x-rays. The presence or absence of side effects is not a good indicator of how well the chemo is working.

How much does chemo cost?

It is very hard to say for sure exactly how much chemo costs. There are many factors that can affect costs, such as:

- what type of chemo you are receiving
- how often and for how long you will get treatment
- at what facility you will be receiving treatment (clinic or hospital)
- insurance and where in the state/country you live

If you need to speak with someone about the cost of your treatment, please ask to speak with a patient financial navigator.

What are clinical trials and how can I participate?

Clinical trials for cancer treatments are used to help find better ways to fight cancer. These may also be called research trials. Sometimes a trial is testing a new chemo medication or a new combination of medications. Talk to your healthcare team to see if a clinical trial may be an option for you.

Prescriptions

We will make sure you have the basic prescriptions you will need at home before you come on your first treatment day. Make sure to let us know what pharmacy you will be using so we can send prescriptions electronically for you. Your health care team will discuss the prescriptions with you and review how/when to take them.**

There may be other medications that are sent for you to start with or before treatment. Your healthcare team will go over all prescriptions with you. Please make sure you understand how to take all of your medications.

***Prescription refills – Please call the office two to three days in advance for refills, especially for narcotics (pain medications) or other controlled substances.*

Notes for my prescriptions:

Side Effects of Chemotherapy

What are side effects?

Side effects are symptoms that are caused by cancer treatments. They can vary from patient to patient. Remember, the severity of side effects does not determine the effectiveness of the treatment. Common side effects are changes in appetite and taste, constipation, diarrhea, fatigue, hair loss, low blood counts, mouth sores, and nausea or vomiting. In this section, information about potential side effects is provided, along with suggestions that may help ease the side effects. Always let your physician and/or nurse know if you are suffering from these, or other, side effects. There are many ways we can help you combat these issues during treatment.

Why do I have side effects?

Chemo works by killing your cancer cells. Most chemo medications cannot tell the difference between your cancer cells and your healthy cells. The majority of side effects you may experience are a result of the effects the medication has on fast-growing, healthy cells, such as the cells that make your hair grow, the cells lining your mouth or your intestines and the cells in your bone marrow that produce blood cells.

How long will my side effects last?

This will depend on your general health and the type of treatment you receive. Most side effects will go away after treatment is complete; however, some side effects may take months or years to disappear.

A small number of chemo medications can cause long-term side effects that do not go away. This can include damage to your heart, kidneys, lungs, nerves and reproductive system. Ask your healthcare team if the chemo you will get is going to potentially cause these side effects.

What can I do about my side effects?

There are many ways that your healthcare team can ease or eliminate the side effects caused by chemo. Talk to your physician or nurse if you are experiencing anything new after you start treatment, as it might be a side effect. Also, see the following information on how to deal with the most common side effects of chemo.

Questions for my team:

Mental Health Side Effects

Anxiety

It is perfectly normal to feel anxious about a diagnosis of cancer and starting treatment. It is a very frightening time for patients and their families. Anxiety may feel like overwhelming fear or stress, worry or even moments of complete panic. Anxiety can cause many different feelings in your body.

- It may affect your appetite, causing you to not want to eat.
- It can cause headaches and muscle pains or tightness.
- It can upset your stomach, causing diarrhea or nausea/vomiting.
- It can cause shortness of breath or make it hard to breath.
- It may make you feel restless and unable to sit still.
- It may cause difficulty sleeping at night.

Not dealing with the anxiety can make it harder for your body to fight the cancer.

Things to do to manage anxiety:

- Listen to relaxing music or use guided meditation.
- Do things that you enjoyed prior to your diagnosis.
- Get plenty of rest and do it in a quiet place.
- Journal your feelings or read for pleasure.
- Get light exercise as you are able.
- Talk with your healthcare team about how you are feeling and see how they can help.

Caregivers can help with these feelings by:

- Staying with the patient during these times. Try to be reassuring and stay calm.
- Talk with the patient about things that you would have discussed prior to their diagnosis.
- Speak with the healthcare team if you are worried about the patient.

Depression

Many people struggle with feelings of sadness after they get the diagnosis of cancer and during treatment. This is normal and can change from day to day. However, if you are struggling with these feelings for more than a day or two at a time, it may be a sign of depression. This can be a serious problem and needs to be addressed with your healthcare team. If you feel like you are depressed, please speak to your doctor or nurse. We need to know if there is a problem so we can help. Some signs of depression are:

- a feeling of helplessness or hopelessness or that your life has no meaning
- no interest in being with your family or friends
- not enjoying the hobbies/activities you used to enjoy
- crying for long periods of time or every day
- decrease in appetite or loss of weight
- changes in your energy level, sleeping all the time, or not sleeping well
- thoughts of taking your own life, thinking about a plan to commit suicide or frequent thoughts of death or dying

If you experience any of these signs, please talk with your healthcare team immediately.

If you ever feel like harming yourself or others and you cannot get in touch with your healthcare team, call 911 or go to the nearest Emergency Room. You can also call the National Suicide Prevention Lifeline at 1-800-273-8255.

Chemo Brain

This is a term used to describe the feeling of fogginess or cloudy thinking that can happen during cancer treatment. Sometimes the medications given during treatment can affect the brain and how the patient carries on with daily life. Many patients describe it as "feeling like you are walking around with your head in a cloud." It may be harder for you to stay focused on your normal activities. You may have trouble remembering things like names or dates. You may not be able to find the right words or it may take you longer to do things than usual. It can happen quickly and last through all of treatment and even after treatment is completed.

Things to do to manage chemo brain:

- Make lists and write everything down.
- Use a planner for keeping appointments and important dates.
- Do puzzles, games or take a class to exercise your brain.
- Make sure to get enough sleep and eat well. You also need to make sure to stay hydrated.
- Follow a daily routine.
- Do not try to do to many things at once. Keep multi-tasking to a minimum.
- Keep a journal of your day-to-day issues so they can be tracked.

Constipation

Constipation is a condition that causes bowel movements to occur less often than usual, the stool to be hard or dry and/or you have trouble passing the stool. This can be caused by several things, including pain medication, chemo treatments, anti-nausea medications, dehydration, location of the cancer, decreased activity and not eating/drinking enough.

Constipation can also cause gas, bloating, nausea and abdominal pain. Everyone's bowel patterns are different, so it is important that you know what is normal for you.

Please call the doctor's office should you have persistent constipation (no bowel movement in two to three days) or abdominal pain.

Things to do to manage constipation:

Keep a record of your bowel movements. Show this record to your doctor or nurse and talk about what is normal for you. This makes it easier to figure out whether you have constipation.

Drink at least eight cups of water or other fluids each day. Many people find that drinking warm or hot fluids, such as coffee and tea, helps with constipation. Fruit juices, such as prune juice, may also be helpful.

Be active every day. You can be active by walking, riding a bike or doing yoga. If you cannot walk, ask about exercises that you can do in a chair or bed. Talk with your doctor or nurse about ways you can be more active.

Check with your doctor or nurse before using fiber supplements, laxatives, stool softeners or enemas.

Ask your doctor, nurse or dietitian about foods that are high in fiber. Eating high-fiber foods and drinking lots of fluids can help soften your stools. Good sources of fiber include whole-grain breads and cereals, dried beans and peas, raw vegetables, fresh and dried fruit, nuts, seeds and popcorn.

Let your doctor or nurse know if you have not had a bowel movement in two days. Your doctor may suggest a fiber supplement, laxative, stool softener or enema. Do not use these treatments without first checking with your doctor or nurse.

Should you need medication you can take:

- Senekot® – one to two pills twice daily or
- Peri-Colace – one to two pills twice daily

If constipation persists, you can also take:

- MiraLAX® – one packet (17 grams) diluted in eight ounces of liquid once or twice daily
- Dulcolax® – 10 mg orally twice daily

Diarrhea

Diarrhea is having frequent, soft, loose or watery bowel movements. When fluids and food pass too quickly through the body, there is not time for the absorption of nutrients. This can cause electrolyte imbalances, dizziness, dehydration and weight loss. Some chemotherapy medications can cause diarrhea. If you experience this, take IMODIUM-AD®, as directed by your physician.

Call the office if you have any of these symptoms:

- four or more loose stools in a 24-hour period that are not controlled with IMODIUM-AD® or diet adjustments
- racing heart or feeling like it is skipping beats
- feeling dizzy or lightheaded
- urine output is decreased
- pain or cramping with the diarrhea
- fever over 100.4°

Things to do to manage diarrhea:

Eat five or six small meals and snacks each day instead of three large meals. Many people find it easier to eat smaller amounts more often.

Ask your doctor or nurse about foods that are high in salts, such as sodium and potassium. Your body can lose these salts when you have diarrhea and it is important to replace them. Foods that are high in sodium or potassium include bananas, oranges, peach and apricot nectar, and boiled or mashed potatoes.

Drink eight to 12 cups of clear liquids each day. Examples include water, clear broth, ginger ale or sports drinks, such as Gatorade® or Propel®.

Drink slowly and choose drinks that are at room temperature.

Let carbonated drinks lose their fizz before you drink them. Add extra water if drinks make you thirsty or sick to your stomach.

Eat low-fiber foods. Foods that are high in fiber can make diarrhea worse. Low-fiber foods include bananas, white rice, white toast and plain or vanilla yogurt.

Be gentle when you wipe yourself after a bowel movement. Instead of toilet paper, use a baby wipe or squirt of water from a spray bottle to clean yourself after bowel movements. Let your doctor or nurse know if your rectal area is sore or bleeds or if you have hemorrhoids.

Ask your doctor if you should try a clear liquid diet. This can give your bowels time to rest. Most people stay on this type of diet for five days or less.

Avoid:

- drinks that are very hot or very cold
- beer, wine and other types of alcohol
- milk or milk products, such as ice cream, milkshakes, sour cream and cheese
- spicy foods, such as hot sauce, salsa, chili and curry dishes
- greasy and fried foods, such as french fries and hamburgers
- foods or drinks with caffeine, such as regular coffee, black tea, cola and chocolate
- foods or drinks that cause gas, such as cooked dried beans, cabbage, broccoli, soy milk and other soy products
- foods that are high in fiber, such as cooked dried beans, raw fruits and vegetables, nuts, and whole-wheat breads and cereals

Fatigue

Fatigue can make you feel weak, worn out, tired or make you feel like you are moving extra slow. Resting does not always help. Fatigue is different for every person. This can be caused by the chemo treatment, stress, anxiety or generally feeling overwhelmed. As you continue treatment, there are increased demands on your body and a great deal of energy is used to rebuild healthy cells. Fatigue may also be more severe if you are getting chemotherapy and radiation at the same time.

Things to do to manage fatigue:

Exercise.
Staying active is the best way to help combat fatigue. A walk, bike ride or a short session of yoga can help give you extra energy.

Eat and drink well.
Often, this means five to six small meals and snacks a day rather than three large meals.

Keep foods around that are easy to fix, such as canned soups, frozen meals, yogurt and cottage cheese. Drink plenty of fluids each day—about eight cups of water or juice.

Plan time to rest.
You may feel better when you rest or take a short nap during the day. Many people say that it helps to rest for just 10 to 15 minutes rather than nap for a long time. If you nap, try to sleep for less than one hour. Keeping naps short will help you sleep better at night.

Try not to do too much.
With fatigue, you may not have enough energy to do all the things you want to do. Choose the activities you want to do and let someone else help with the others. Try quiet activities, such as reading, knitting or an online activity.

Sleep at least eight hours each night.
This may be more sleep than you needed before chemotherapy. You are likely to sleep better at night when you are active during the day. You may also find it helpful to relax before going to bed. For instance, you might read a book, work on a jigsaw puzzle, listen to music or do other quiet hobbies.

Plan a work schedule that works for you.
Fatigue may affect the amount of energy you have for your job. You may feel well enough to work your full schedule. Or you may need to work less—maybe just a few hours a day or a few days each week. If your job allows, you may want to talk with your boss about ways to work from home. Or you may want to go on medical leave (stop working for a while) while getting chemotherapy.

Let others help.
Ask family members and friends to help when you feel fatigue. Perhaps they can help with household chores or drive you to and from doctor's visits. They might also help by shopping for food and cooking meals for you to eat now or freeze for later.

Keep a diary of how you feel each day.
This will help you plan how to best use your time. Share your diary with your nurse. Let your doctor or nurse know if you notice changes in your energy level, whether you have lots of energy or are very tired.

Talk with your doctor or nurse.
Your doctor may prescribe medication that can help decrease fatigue, give you a sense of well-being and increase your appetite or may also suggest treatment if your fatigue is from anemia.

Hair Loss

Chemotherapy can affect the cells that cause hair growth. Not all chemotherapy will cause hair loss. Ask your healthcare team if the type of chemo you are getting will cause hair loss. DigniCap®, a scalp cooling system, is available at some offices and may prevent hair loss with some chemotherapy drugs. Talk with your physician for further information.

Hair loss usually occurs two to three weeks after the start of treatment. Hair may fall out in clumps or just start to thin. If you choose to buy a wig, this can be done prior to losing your hair.
A prescription for a wig can be written for you. You will need to inquire with your insurance if they will cover the cost of a wig. There are also some local groups who provide wigs for free to cancer patients. Ask your nurse for this information. Hair will usually start to grow back six to eight weeks after treatment is complete.

Things to do before hair loss:

Cut your hair short or shave your head.
You might feel more in control of hair loss if you first cut your hair or shave your head. This often makes hair loss easier to manage. If you shave your head, an electric shaver is recommended instead of a razor.

Be gentle when you wash your hair.
Use a mild shampoo, such as a baby shampoo. Dry your hair by patting (not rubbing) it with a soft towel.

Sleep on a satin pillowcase.
Satin has less friction than most cotton cases and may be more comfortable for you.

Do not use items that can hurt your scalp. These include:

- straightening or curling irons
- brush rollers or curlers
- electric hair dryers
- hair bands and clips
- hairsprays
- hair dyes
- products to perm or relax your hair

Things to do after hair loss:

Protect your scalp.
Your scalp may hurt during and after hair loss. Protect it by wearing a hat, turban or scarf when you are outside. Try to avoid places that are very hot or very cold. This includes tanning beds and outside in the sun or cold air. And always apply sunscreen or sunblock to protect your scalp.

Stay warm.
You may feel colder once you lose your hair, as body heat can be lost through your scalp. Wear a hat, turban, scarf or wig to help you stay warm.

Talk about your feelings.
Many people feel angry, depressed or embarrassed about hair loss. If you are very worried or upset, you might want to talk about these feelings with a doctor, nurse, family member, close friend or someone who has had hair loss caused by cancer treatment.

Low Blood Counts

Your blood counts may be altered by treatment and your physician will be following them closely.

Neutropenia

This is a low white blood cell count (WBC) and a low neutrophil count. White blood cells are the cells that fight infection in your body. Chemotherapy often causes the number of these cells in your body to drop but this is a normal side effect. If your WBC count is too low, we will not be able to do your treatment and you will be given infection precautions by the nurse. There are medications that can be given to help boost these cell counts. Your healthcare team will talk with you about these medications, if needed.

When am I at the highest risk for infection?

The term 'nadir' means low point. You are at the highest risk for infection when you hit nadir after each chemo cycle. This usually occurs seven to ten days after your treatment day.

What are the symptoms of infection I should look for?

Fever is often the first sign of infection. *Call your physician's office if you run a fever of 100.4 or higher.* The number for the office can be found on the front of this guide. Do not take medications that will reduce your fever without your physician's approval. These are medications such as ibuprofen (Motrin® or Advil®), naproxen (Aleve®) or acetaminophen (Tylenol®).

Other symptoms of infection include:

- chills
- swelling or redness anywhere on the body, especially a wound, IV site or port
- a new or worsening cough
- pain with urination or cloudy urine

If you experience chills, dizziness, shortness of breath, changes in mental status or confusion, go to the nearest Emergency Room or call 911 for assistance.

Things to do to prevent infection:

Wash your hands often with soap and water.
Be sure to wash your hands before cooking and eating, after you use the bathroom, blow your nose, cough, sneeze or touch animals. Carry hand sanitizer for times when you are not near soap and water.

Use sanitizing wipes to clean surfaces and items that you touch.
This includes public telephones, ATM machines, doorknobs and other common items.

Be gentle and thorough when you wipe yourself after a bowel movement.
Instead of toilet paper, use a baby wipe or squirt of water from a spray bottle to clean yourself. Let your doctor or nurse know if your rectal area is sore or bleeds or if you have hemorrhoids.

Stay away from people who are sick.
This includes people with colds, flu, measles or chicken pox. You also need to stay away from children who just had a "live virus" vaccine for chicken pox or polio. Call your doctor or nurse if you have any questions.

Stay away from crowds.
Try not to be around a lot of people. For instance, plan to go shopping or to the movies when the stores and theaters are less crowded.

Be careful not to cut or nick yourself.
Do not cut or tear your nail cuticles. Use an electric shaver instead of a razor. And be extra careful when using scissors, needles or knives.

Watch for signs of infection or changes around your catheter.
Signs to look for include drainage, redness, swelling or soreness. Tell your doctor or nurse about any changes you notice near your catheter.

Maintain good oral care.
Brush your teeth after meals and before you go to bed. Use a very soft toothbrush. You can make the bristles even softer by running hot water over them just before you brush. Use a mouth rinse that does not contain alcohol. Check with your doctor or nurse before going to the dentist.

Take good care of your skin.
Do not squeeze or scratch pimples. Use lotion to soften and heal dry, cracked skin. Dry yourself after a bath or shower by gently patting your skin. Be careful not to rub your skin.

Clean cuts right away.
Use warm water, soap and an antiseptic to clean your cuts. Clean your cut like this every day until your cut has a scab over it.

Be careful around animals.
Do not clean your cat's litter box, pick up dog waste or clean bird cages or fish tanks. Be sure to wash your hands after touching pets and/or other animals.

Do not get a flu shot or other type of vaccine without first asking your doctor or nurse.
Some vaccines contain a live virus, to which you should not be exposed.

Practice food safety rules.
Keep hot foods hot and cold foods cold. Do not leave leftovers sitting out. Put them in the refrigerator as soon as you are done eating.

Wash raw vegetables and fruits well before eating them.
Avoid those that cannot be washed well, such as raspberries.

Do not eat raw or undercooked fish, seafood, meat, chicken or eggs.
These foods may have bacteria that can cause infection.

Do not eat or drink items that are past the freshness date.
Do not eat foods that have moldy spots, even if you cut them out.

Thrombocytopenia

This is a low platelet count. Platelets are the clotting cells of the body. Chemotherapy can cause the number of these cells in your body to drop. If your platelets are low, you are at risk for bleeding. You may need a platelet transfusion or a delay in your chemotherapy treatment if your platelet count is too low. The nurse will discuss bleeding precautions with you.

Call your physician's office if you have any of these symptoms:

- bruises, especially if you did not bump into anything
- small, red spots on your skin
- red- or pink-colored urine
- black or bloody bowel movements
- bleeding from your gums or nose
- heavy bleeding during your menstrual period or for a prolonged period
- vaginal bleeding not caused by your period
- headaches or changes in your vision
- a warm or hot feeling in your arm or leg
- feeling very sleepy or confused

Things to do to prevent bleeding or injury:

- Brush your teeth with a soft toothbrush and do not floss your teeth.
- Be careful with any sharp objects like knives or tools.
- Do not climb on ladders or stools to prevent falls.
- Use an electric razor when shaving.
- Protect your hands and feet from scrapes or cuts by wearing gloves while working in the yard and wearing shoes at all times.
- Blow your nose gently.
- Apply gentle but firm pressure to any cuts you get until the bleeding stops.

Anemia

This is a low red blood cell count (RBC). Red blood cells carry oxygen to your tissues and waste away from the tissues. Chemotherapy can cause the number of these cells to drop. If these counts are low, you may experience some fatigue and shortness of breath. There are medications that can be given to help boost these cell counts or you may need a blood transfusion if your blood count falls too low. Your healthcare team will discuss this with you, if needed, and will follow your blood counts closely during treatment.

Call your physician's office if you have any of these symptoms:

- Your level of fatigue changes or you are not able to do your usual activities.
- You feel dizzy or like you are going to faint.
- You feel short of breath.
- It feels like your heart is pounding or beating very fast.

Nausea/Vomiting

Nausea and vomiting can occur while you are getting treatment, right after, or hours or days later. New drugs can help prevent nausea and vomiting. These are called antiemetic or anti-nausea drugs. You may need to take these drugs one hour before each treatment and for a few days after. Antiemetic medications will also be given intravenously prior to your treatment.

How long you take anti-nausea drugs after treatment will depend on the type of therapy you are getting and how you react to it. If one anti-nausea drug does not work well for you, your doctor can prescribe a different one.

You may need to take more than one type of drug to help with nausea. Talk with your doctor or nurse about treatments to control nausea and vomiting caused by treatment.

If you are still suffering from nausea or vomiting after taking the medications and adjusting your diet, please call the office.

Things to do to prevent or manage nausea or vomiting:

Take anti-nausea meds as prescribed.
Do not wait until you are vomiting to start taking them.

Prevent nausea.
One way to prevent vomiting is to prevent nausea. Try having bland, easy-to-digest foods and drinks that do not upset your stomach. These include plain crackers, toast and gelatin.

Plan when it's best for you to eat and drink.
Some people feel better when they eat a light meal or snack before chemotherapy. Others feel better when they have chemotherapy on an empty stomach (nothing to eat or drink for two to three hours before treatment).

Eat small meals and snacks.
Instead of three large meals each day, many people find it easier to eat if they have five or six small meals and snacks. It also helps not to drink a lot before or during meals and to avoid lying down right after you eat.

Drink plenty of fluids between meals.
This will help with nausea but will also help to remove the toxins caused by the treatment from your system. Hydration is important during chemo. Fluids can be obtained through:

- water or broths
- sports drinks (Gatorade or Powerade®)
- powdered electrolyte products (Drip Drop or Ensure® Rapid Hydration)
- caffeine free teas
- ginger ale or Sprite

Eat and drink items that are not too hot nor too cold.
Give hot foods and drinks time to cool down or make them colder by adding ice. You can warm up cold foods by taking them out of the refrigerator one hour before you eat or warming them slightly in a microwave. Drink cola or ginger ale that is warm and has lost its fizz.

Avoid strong smells.
Try to avoid foods and drinks with strong smells, such as coffee, fish, onions, garlic and foods that are cooking.

Suck on small bites of popsicles or fruit ices.
You may also find sucking on ice chips helpful.

Suck on sugar-free mints or tart candies.
Do not use tart candies if you have mouth or throat sores.

When you feel like vomiting, breathe deeply and slowly or get fresh air.
You might also distract yourself by chatting with friends or family, listening to music or watching a movie or TV shows.

You may also use essential oils or homeopathic/complementary treatments.
These should be discussed with your healthcare team first.

Mouth Sores

Sometimes chemotherapy can harm fast-growing cells, such as those that line your mouth, throat and lips. This can affect your teeth, gums, the lining of your mouth and the glands that make saliva. Most mouth problems go away a few days after chemotherapy is over.

Mouth and throat problems may include:

- dry mouth
- changes in taste and smell, such as when food tastes like metal or chalk, has no taste or does not taste or smell like it used to
- infections of your gums, teeth or tongue
- increased sensitivity to hot or cold foods
- mouth sores or areas of tenderness
- white or dark patches
- trouble eating when your mouth gets very sore

Things to do to manage mouth and throat problems:

Visit a dentist at least two weeks before starting chemotherapy treatment.
It is important that your mouth is as healthy as possible, which means having all your dental work done before chemotherapy starts. If you cannot go to the dentist before chemotherapy

starts, ask your doctor or nurse when it is safe to go. Be sure to tell your dentist that you have cancer and about your treatment plan.

Check your mouth and tongue every day.
By checking your mouth, you can see or feel problems (such as mouth sores, white spots or infections) as soon as they start. Inform your doctor or nurse right away if you see any of these problems.

Keep your mouth moist.
You can keep your mouth moist by sipping water throughout the day, sucking on ice chips or sugar-free hard candy, or chewing sugar-free gum. Ask your doctor or nurse about saliva substitutes if your mouth is always dry.

Brush your teeth, gums and tongue after each meal and at bedtime.
Use an extra-soft toothbrush. You can make the bristles even softer by rinsing your toothbrush in hot water before you brush.

If brushing is painful, try cleaning your teeth with cotton swabs or Toothettes®, which are shaped sponges on a stick.

Use a fluoride toothpaste or special fluoride gel that your dentist prescribes.

Do not use mouthwash that has alcohol. Instead, rinse your mouth three to four times a day with a solution of baking soda, salt and warm water followed by a plain water rinse.

There are many recipes for this solution, but an example is 1/4 teaspoon baking soda, 1/8 teaspoon salt and one cup of warm water. Swish/gargle every two hours as needed.

Gently floss your teeth every day.
If your gums bleed or hurt, avoid those areas but floss your other teeth. Ask your doctor or nurse about flossing if your platelet count is low.

If you wear dentures, make sure they fit well and keep them clean. Also, limit the length of time that you wear them.

Be careful what you eat when your mouth is sore.

Choose foods that are moist, soft and easy to chew or swallow. These include cooked cereals, mashed potatoes and scrambled eggs.

Use a blender to puree cooked foods so that they are easier to eat. To help avoid infection, be sure to wash all blender parts before and after using them. If possible, it is best to wash them in a dishwasher.

Take small bites of food, chew slowly and sip liquids while you eat.

Soften food with gravy, sauces, broth, yogurt or other liquids.

Eat foods that are cool or at room temperature. You may find that warm and hot foods hurt your mouth or throat.

Suck on ice chips or popsicles. These can relieve mouth pain.

Call your doctor, nurse or dentist if your mouth hurts a lot. Your doctor or dentist may prescribe medicine for pain or to keep your mouth moist. Make sure to give your dentist the phone number of your doctor and nurse.

Avoid things that can hurt, scrape or burn your mouth, such as:

- sharp or crunchy foods, such as crackers and potato or corn chips
- spicy foods, such as hot sauce, curry dishes, salsa and chili
- citrus fruits or juices such as orange, lemon and grapefruit
- food and drinks that have a lot of sugar, such as candy or soda
- beer, wine and other types of alcohol
- toothpicks or other sharp objects
- tobacco products, including cigarettes, pipes, cigars and chewing tobacco

Skin and Nail Changes

Chemotherapy treatments can affect your skin and nails. These effects are usually mild but can be worrisome if you are not prepared. Many of these changes will get better once you have finished chemotherapy.

Skin changes may include:
Itching, dryness, redness, rashes and peeling

Sensitivity to the sun (when you burn quickly)
This problem can happen even to people who have very dark skin color.

Hyperpigmentation
A problem that results in dark patches on your skin or a darker skin color. Dark patches may occur in the following locations:

- around your joints
- under your nails
- in your mouth
- along the vein used to give you chemotherapy
- under tape or dressings
- in your hair

Radiation recall
Some chemotherapy causes skin in the area where you had radiation therapy to turn red. The color can range from very light to bright red. Your skin may blister, peel or be very painful.

Allergic reactions to chemotherapy
Some skin changes mean that you are allergic to the chemotherapy. Let your doctor or nurse know right away if you wheeze or have trouble breathing along with:

- sudden and severe itching
- rashes
- hives

Nail Changes
Besides becoming darker, your nails may also turn yellow or become brittle and cracked. Sometimes your nails will loosen, lift from the nailbed and fall off, but new nails will grow back in.

Things to do to manage skin and nail changes:
Sprinkle yourself with cornstarch.

Take quick showers or sponge baths instead of long, hot baths.

Pat, rather than rub, yourself dry after bathing.

Wash with a mild, moisturizing soap.

Put on cream or lotion while your skin is still damp after washing. Tell your doctor or nurse if this does not help.

Do not use perfume, cologne or aftershave lotion that has alcohol.

Take a colloidal oatmeal bath when your whole body itches. Colloidal oatmeal is a special powder you add to bath water.

Acne-type rash:
Keep your face clean and dry.

Ask your doctor or nurse if you can use medicated creams or soaps and which ones to use.

Sensitivity to the sun:
Avoid direct sunlight.

During the summer, the sun tends to be the strongest from 10 a.m. until 4 p.m.

Use sunscreen lotion with an SPF (skin protection factor) of 30 or higher. Or use ointments that block the sun's rays, such as those containing zinc oxide.

Keep your lips moist with a lip balm that has an SPF of 30 or higher.

Wear light-colored pants, long-sleeve cotton shirts and hats with wide brims.

Do not use tanning beds.

Radiation Recall

Protect the area of your skin that received radiation therapy from the sun.

Do not use tanning beds.

Place a cool, wet cloth where your skin hurts.

Wear clothes that are made of cotton or other soft fabrics. This includes your underwear (bras, underpants and t-shirts).

Nail Problems

Wear gloves when washing dishes, working in the garden or cleaning the house.

Let your doctor or nurse know if your cuticles are red and painful.

Use tea tree oil if your nail beds loosen.

Sleep Problems

It is common for cancer patients to have trouble sleeping. This can be caused by pain, anxiety, depression, side effects of treatment, night sweats or staying overnight in the hospital. Your body will need more sleep as you go through treatment, as well.

Not getting enough sleep can cause:

- increased pain
- memory changes
- increased fatigue
- decreased healing
- increased sickness/infection

Things to do to manage problems with sleep:

- Get enough exercise during the day, light exercise is fine; 30-60 minutes per day at least two to three hours before bedtime.
- Avoid drinks with caffeine or alcohol in the evening.
- Drink warm decaffeinated or herbal tea or milk before bedtime.
- Have someone give you a massage or try relaxation techniques prior to going to bed.
- Use the bed for sleep or sex only. Do not watch television in bed.
- Take any sleep aid medications at the same time every evening.
- Try to go to bed when you are tired and around the same time each night.
- Adjust the temperature in the bedroom for maximum comfort.

Questions for my team:

Activity During Treatment

Exercise during treatment is important for many reasons. It can help to reduce fatigue, helps keep your strength up, improves heart health, improves sleep and mood and gives you more energy. We encourage you to stay as active as you can. You can continue to work during treatment if your job is not something that will increase your risk for injury or infection. You can also continue with your hobbies and we encourage light exercise, such as walking or biking. Please do any outdoor exercises in the cooler times of day and be careful to keep skin covered and protected from the sun.

Some helpful hints when exercising:

- Always talk with your doctor before starting any new fitness routine.
- Ask family or friends to join you.
- You can use a fitness tracker to help you stay motivated.
- Doing a little exercise is better than doing nothing.
- We want you to keep as much of your schedule as you can while in treatment.

- Work – ask your doctor if you can continue to work during treatment.
- Hobbies – continue to do the things that make you happy, just do not overdo it.
- Nap as needed, but do not stay in bed all day. If you have trouble with daily activities, let your doctor or nurse know.

Be Safe!!!

- Do not exercise if you are not feeling well, have a fever, are feeling nauseated or are throwing up.
- If you have swelling in your ankles or unexplained weight gain or if you have difficulty breathing while at rest, please call the office immediately.
- Avoid public gyms if your white blood count is low.
- Avoid contact sports if you have a port-a-cath or central line (PICC). These include football, basketball, wrestling or lacrosse. You also do not want to use a rifle on the side of port/line. Trauma to the area can damage the site.
- You can swim if your port site is healed and it is not in use. If you have a PICC line in place, do not swim.

Questions for my team:

Nutrition During Treatment

Eating well during chemotherapy treatment is essential. You should fill your plate at mealtimes with 2/3 fruits, vegetables, whole grains and legumes (beans/peas) and only 1/3 of your plate should be animal products. Have at least five servings of fruits and vegetables every day.

A serving size can be 1/2 cup cooked fruits or vegetables, one cup raw fruits or vegetables or one baseball sized piece of fresh fruit. Getting enough nutrition is helpful in fighting off fatigue, constipation and weight loss. A balanced diet is the most important thing to have.

Protein is important while you are going through treatment because this is what you body will use to rebuild the healthy cells and help you keep your muscles strong. You should have protein with every meal. Many people also use protein drinks/shakes to help keep up with the protein demand. This can also provide additional calories. Try not to drink these at mealtime but between meals instead.

Plant based proteins include:
Nuts, nut butters, seeds, legumes and soy.

Animal based proteins include:
Beef, pork, chicken, eggs, milk, cheese, fish or other seafood and yogurt.

It is important that all the meats that you eat are thoroughly cooked. Do not eat anything raw or unwashed while on treatment.

Food safety is a must while on treatment.

- Be sure not to cross contaminate your raw meats with your fresh fruits and vegetables while shopping or putting away.
- Wash all fruits and vegetables before you eat them.
- Be sure to keep the counters in your kitchen clean. Wipe them down with antibacterial wipes or bleach water regularly and especially after having raw meat out on the counter.
- Do not eat/drink anything unpasteurized.
- It is important that you wash your hands before preparing or eating food, after using the restroom and after touching any pets.
- Do not put cooked foods back onto a plate that held raw meat without washing it first.
- Properly package and refrigerate any leftovers immediately after the meal is finished.

It is also very important to stay hydrated. We recommend at least two to three liters of fluids per day. You should start this the day before your first treatment and continue until the full completion of treatment. Remember, any drink with caffeine should not be counted in the total amount of fluids.

If you would like more information about nutrition during treatment or if you are having trouble with eating/weight loss, please talk with your healthcare team. We can connect you with our staff nutritionists.

Notes about my nutrition:

Treatment Day

We use many different treatments to treat cancer. These medications can be used alone or together in combination treatments. Your doctor, along with the rest of your team, will use guidelines to decide what the best plan of treatment is for you. There are many factors that go into the decision, such as diagnosis and your general health, just to name a few.

Some patients will be in the treatment room for less than an hour and others will spend all day. We will always check your blood work before we get started to assure that your labs are good prior to giving any treatment.

Remember: If your WBCs or platelets are too low, we will not be able to give your treatment that day.

Please make sure that you dress warmly or bring a jacket with you in case you get cold. It is not uncommon for patients to feel cooler once we have started the IV fluids associated with treatment. If we will be using a port for your treatment, please wear a button-down shirt or a shirt with a wide neck so that we can have access to your port. If we are using an IV in your arm, make sure that you wear short sleeves or can push the sleeve up past your elbows.

When you come in for treatment, we will get your vital signs (blood pressure, temperature, heart rate and weight). Once we know your blood work and your vital signs are good, we will proceed with treatment as planned.

There are often medications that are given to support you while you are getting therapy. These medications will be given prior to getting the actual treatment and are things like Tylenol®, antihistamines (Benadryl®), anti-nausea medications and steroids. The purpose of these medications is to help keep you comfortable during treatment and decrease the likelihood of reactions.

Any time we give you a new medication we will ask you for your name and date of birth. This is for your safety and to assure that you are getting what is planned for you specifically.

Once these medications are infused, there will be an observation period to allow these medications to work and provide their maximum benefit. Treatment infusion will then begin. You should not feel anything different while the treatment is being infused. If you have any change in how you feel during the infusion, please alert your nurse **immediately**. This might be anything from itching, shortness of breath, chest pain, low back pain, chills, sweating or tingling of your mouth or lips. The sooner you make the nurse aware, the sooner they can respond to help alleviate your symptoms.

You may get up and move around during treatment. Please feel free to use the restroom or refill your water as needed. If you need assistance, the staff nurses will be more than happy to help; you need only ask.

Things I want/need to take with me on treatment days:

After treatment

Treatment medications are excreted in your bodily fluids. This means there may be a small amount of medication in your urine, stool, saliva, vomit, semen and vaginal fluids. It is important that other people in the house are not exposed to these fluids.

There are some basic guidelines to follow when you get home, after you have received treatment. It is important that you handle your own soiled clothing/linens whenever possible. If someone else must handle these things, they need to wear gloves and wash their hands right away afterwards. If someone accidentally touches body fluids, they need to wash their hands immediately.

If there are soiled clothes/linens:

- You should gather all soiled articles and wash immediately. Wash separately from all other clothing/linens in hot water using your normal laundry detergent.
- If the soiled articles cannot be washed right away, place them in a plastic bag and seal them until they can be washed.
- When finished cleaning up soiled clothing or linen make sure to wash your hands.

When using the restroom:

- It is important that you flush twice after using the toilet for at least the first 48 hours after you have gotten treatment.
- If possible, use a separate bathroom from everyone else in the house. If this is not possible, make sure to wipe down the toilet seat after each use with a sanitizing wipe.
- Wash your hands after using the toilet and make sure not to touch any surfaces until you have washed your hands.
- If you are using a bedside commode or bedpan, make sure to use gloves when emptying and cleaning.

You can enjoy your friends and family if you feel up to it. Please make sure that anyone you are spending time with is not sick. If you have visitors in your house, wipe down the frequently touched surfaces (door knobs, light switches, sink handles, etc.) after everyone leaves. It is important to wear a mask when in public to protect yourself from the germs of others. Try to run your errands when there will be a fewer number of people or have someone else run the errands for you.

If you plan to have sexual intercourse while receiving treatment:

- Use barrier contraceptives for the first 72 hours after treatment. This is important for both men and women.
- Do not get pregnant while on treatment or let anyone who is pregnant be exposed to any body fluids. Keep all children away from body fluids, as well.

If you are taking an oral anti-cancer pill, these same precautions need to be used for the entire time you are on treatment. Do not allow anyone else to touch your pills except you. If someone else needs to help you with your meds, they should wear gloves when handling the medications. Do not flush unused pills down the toilet or throw them away in the garbage.

Survivorship

Survivorship begins at diagnosis. The focus is on the health and life of the patient who is going through treatment and after treatment to the end of their life. Survivorship includes issues that have to do with the patient's ability to get healthcare and follow-up treatment for any physical and sexual health, psychosocial or financial concerns. It also deals with the late effects of treatment, secondary cancers and quality of life.

Our physicians continue to see patients after active treatment is complete. Please let us know how we can help you maintain your best quality of life during your survivorship journey.

CareSpace

You can access your medical chart from home if you have internet access.

Go to FLCancer.com

Click on "CareSpace" in the top right corner. The first time you log in you will need the instructions sent via email by the office staff. Follow the instructions to complete registration. From here you can access your lab results, view pathology and radiology reports and update your medication list. You can also message your doctor from here. If there is something you cannot view, it is usually because the doctor has not signed off on it yet.

Patient Resources

When looking for information online, be careful about your web searches. Be sure that the site you are looking at is up to date, is reputable and is not trying to get you to buy something. You also need to be careful of anything that claims to "cure" cancer. Some trusted sites that you can go to for information on your diagnosis and treatment and for managing side effects are:

American Cancer Society
General cancer information, as well as resources for information on diagnosis, transportation and caregiver/family support
Customer Service: (800) 277-2345
cancer.org

National Comprehensive Cancer Network
Guidelines for treatment by cancer type
nccn.org/patients/guidelines/cancers.aspx

National Cancer Institute
Information on cancer from diagnosis to research
cancer.gov

Cancer.Net
Sponsored by the American Association of Clinical Oncology – gives physician approved information about diagnosis, treatment, clinical trials and symptom management
cancer.net

Chemocare.com
Look up your chemotherapy medications and learn how to manage side effects
chemocare.com

Immunotherapy or Targeted Therapy

Our body's immune system is an intricate system designed to seek out foreign cells and destroy them. This is what happens when we get a cold or the flu. However, the body may not recognize cancer cells as foreign because cancer cells are most often developed from our healthy cells that have mutated. The mutated cells may not be different enough for the immune system to recognize these cells should be destroyed.

Immunotherapy, sometimes known as targeted therapy, are types of medications that can be used to boost the immune system to help it better fight cancer. Often, this type of therapy can be targeted so that the immune system attacks the specific cancer cells while overlooking the normal healthy cells of the body. This generally means less side effects than traditional chemotherapy.

Over the last several decades, there has been much research done to help find more effective ways to treat cancer. Through this research, these "new" treatments were discovered.

While we do not have an immunotherapy to treat every type of cancer, there is progress being made daily in the discovery of new treatments. Immunotherapy will not be effective for every patient because each patient's cancer is unique and what works for one patient may not work for another.

Types of immunotherapy include:

- Monoclonal antibodies – these are proteins that are made in a lab and act like human antibodies in the immune system. They can be used to target a very specific part of the cancer cell.
- Checkpoint inhibitors – these types of drugs work by blocking checkpoint proteins that are on the surface of cancer cells from binding with their partner proteins. This prevents the "off" signal from being sent, allowing the immune system to attack and kill the cancer cells.
- CAR-T therapy – this type of therapy uses the patient's own T-cells, which are collected from the blood and specially altered to fight cancer. When these cells are re-infused into the patient, they are able to latch on to a specific antigen on the patient's tumor cells and kill them.
- Cytokines – these are small proteins that help carry messages between cells in the immune system. They also send signals that can help make abnormal cells die and normal cells live longer.
- Oncolytic viruses – these are a type of virus that infects and breaks down cancer cells but not normal cells. They can occur naturally or be made in a lab.
- Cancer vaccines – These are used to stimulate the immune system's response by introducing the virus in order to build immunity or fight against a specific type of cancer. They can be given to prevent the cancer from starting at all, or as treatment, and this is given after there is already a known cancer.

Immunotherapy can be used alone or with other chemotherapies in order to develop the most effective treatment for each patient. They are given through an IV or a port, the same as traditional chemotherapy.

***Please note, the side effects of immunotherapy are different than that of chemotherapy. No matter where your cancer began, side effects from immunotherapy can affect your whole body. Side effects may appear shortly after beginning treatment, within the first couple of months or even after you finish treatment. Many of these immune side effects are treatable. Your doctor may prescribe steroids or other medications to help manage any problems. Rare, but serious, side effects can lead to death, especially if left untreated, so it is important that you always notify you doctor immediately if you have any symptoms. Once you have started immunotherapy you will also need to tell any doctor who is treating you for any condition that you have had immunotherapy, even after you have completed treatment.*

Immunotherapy-Specific Side Effects

Skin – rashes, redness, itching, skin changes, pain, swelling, soreness, dry, peeling skin, blisters or sores

Things to do to manage skin side effects:

- Avoid scratching or using soap and hot water on skin.
- Apply a cool cloth or some type of cooling moisturizing cream.
- Contact your doctor immediately if you experience severe inflammation, swelling, intense itching or a widespread or quickly worsening rash.

Abdomen – nausea, vomiting, loss of appetite, abdominal cramping or pain, fever, fatigue, diarrhea, constipation, increase in number of stools, or blood or mucus in the stool

Things to do to manage abdominal side effects:

- Drink plenty of water to prevent dehydration and avoid rich, spicy foods.
- Call your doctor if you experience an increase or changes in your bowel movements, especially if your stools are mushy or watery, or if you have symptoms that interfere with your daily activities.
- Contact your doctor immediately if you experience severe abdominal pain, especially with a fever.

Lung – cough, shortness of breath or chest pain

Things to do to manage respiratory side effects:

- Continue use of asthma or allergy prescriptions during your treatment.
- Call your doctor if you experience a new cough or your cough worsens.
- Call your doctor immediately if you experience chest pain or you develop difficulty breathing, especially if it is sudden.

Liver – fever, chills, muscle or joint aches, headaches, drowsiness, fatigue, sweating, nausea, vomiting, abdominal pain (especially on the upper right side), loss of appetite, bruising or bleeding more easily, yellowing skin or eyes, pale stools or dark urine, or confusion

Things to do to manage liver side effects:

- Drink plenty of water to prevent dehydration and eat a well-balanced diet.
- Avoid alcohol and taking more prescription pain medication than recommended.
- Call your doctor immediately if you experience fever, drowsiness, or confusion, if your skin has turned yellow, or you have severe stomach pain or swelling.

Endocrine – fatigue, headache, nausea, vomiting, abdominal pain, constipation, weight gain or loss, dizziness, confusion, drowsiness, fainting, vision changes or loss of sexual function

Things to do to manage hormonal side effects:

- Eat a healthy diet and exercise regularly.
- Continue taking any thyroid medication you have been prescribed.
- Call your doctor immediately if you experience headaches with dizziness, confusion, drowsiness or fainting, vision changes, fever, nausea or vomiting.

Biosimilars

Biosimilars are a group of safe and effective medications for treating many illnesses, such as chronic skin and bowel diseases (like psoriasis, irritable bowel syndrome, Crohn's disease and colitis), arthritis, kidney conditions and cancer.

Biosimilars are FDA-approved medications that are similar to, and chemically undistinquishable from, the original biologics.

Biologic medicines are usually made from natural sources, using advanced science.

Same expected benefits and risks – Compared with their original biologics, biosimilars:

- are made with the same types of natural sources
- are given in the same form
- provide the same treatment benefits
- have the same potential side effects
- have the same strength and dosage

Access – Biosimilars may provide patients with more access to important treatments:

- more options
- more competition in the health care market
- lower costs

Safe and effective – The FDA makes sure biosimilars are as safe and effective as the original biologic by:

- approving biosimilars after a careful review of data, studies and tests
- continuing to monitor safety and effectiveness
- performing quality checks during medication production
- reviewing patient safety reports made to FDA

Frequently Asked Questions

What are biological medications?

Biological medications (also called biological products) can be made of sugars, proteins, living cells, tissues or a combination of these. They are made from natural and living sources like animal and plant cells, and microorganisms, such as bacteria or yeast.

Biological medications are usually more complex than other drugs. They are often more complicated to purify, process and manufacture.

What is a biosimilar medication?

A biosimilar is a medication that is highly similar to a medication already approved by the FDA – the original biologic (also called the reference product). Biosimilars also have no clinical differences from the original reference product. This means you can expect the same safety and effectiveness from the biosimilar over the course of treatment as you would the reference product. Biosimilars are made from the same types of sources (e.g., living cells or microorganisms) and are just as safe and effective as their original reference products.

Will I save money by using a biosimilar?

Reducing costs is one reason Congress created the FDA-approval pathway for biosimilar medications. However, the FDA does not regulate whether insurance companies cover or reimburse the cost of biosimilars. If you have insurance, check with your insurance provider to find out what's included in your plan. If you are covered by Medicare or Medicaid, the Centers for Medicare & Medicaid Services (CMS) and plan providers can generally provide this information.

Is it safe to take a biosimilar if I started treatment on the reference product first?

Generally, biosimilar medications can be used whether or not you have been treated first with the reference product. Always talk to your health care provider about available treatment options and potential risks and benefits.

How will I know if I am using a biosimilar medication for my treatment?

Talk to your health care provider about the medications you are prescribed or are taking. Often, biological medications, including biosimilars, are given in a hospital or an infusion center. Talk to the doctor or nurse who is giving you the treatment. If you have a prescription, your doctor or pharmacist can tell you what you are prescribed and what you are being given at the pharmacy.

How are biosimilars different from generics?

Biosimilars are like generics in some ways, in that both types of medications are compared to a reference (original) product for approval. Biosimilars and generics are both versions of previously FDA approved medications and may offer more affordable treatment options.

Biosimilars and generics are approved through different abbreviated pathways that avoid duplicating certain costly clinical trials.

Both biosimilar and generics go through a rigorous review process. Once FDA-approved, these medications are just as safe and effective as the reference products to which they are compared; however, there are differences between biosimilars and generic drugs. For example, biosimilars are generally made from natural and living ingredients, and generics are often made from chemical ingredients.

In contrast to a chemical, which is created in a lab and can be generally copied, a biologic medication is made from natural and living sources and cannot be exactly copied. So, the information needed to demonstrate that a biosimilar is related to a biologic can be much more extensive than what is generally needed for a generic.

Talk to your doctor to learn more.

Biosimilar Definitions

Reference Product: A reference product is the single biological product, already approved by the FDA, against which a proposed biosimilar product is compared.

Biosimilar Product: A biosimilar is a biological product that is highly similar to, and has no clinically meaningful differences from, an existing FDA-approved reference product.

Interchangeable Product: An interchangeable product is a biosimilar product that meets additional requirements to show that an interchangeable product produces the same clinical result as the reference product in any given patient.

Source: FDA.gov

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