

A photograph of two women standing outdoors, smiling and looking towards the right. The woman on the left is wearing a blue turban and a maroon cardigan over a white t-shirt. The woman on the right has long, wavy white hair, wears glasses, and a floral patterned top. The background shows a soft-focus landscape with trees and a cloudy sky.

Chemotherapy for Cancer

What It Is, How It Helps



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Chemotherapy is one of the most common treatments for cancer. It can be used alone or with other treatments.

If your treatment plan includes chemotherapy, knowing how it works and what to expect can help you make good decisions as you prepare for treatment.

What is chemotherapy?

Chemotherapy, or chemo, is one kind of medicine used to treat cancer. Some kinds of chemo are better at treating certain cancers than others. Each one works differently and has different side effects.

Many people think that targeted drug therapy, immunotherapy, and hormone therapy are the same as chemotherapy.

But these treatments work differently and can have different side effects. Ask your cancer care team what specific types of treatment you are getting.

How does chemo work?

Chemo works by killing cancer cells at different phases of their life cycle. That's why more than one kind of chemo is sometimes used – different chemo medicines target different phases.

The goal of chemo is to balance killing as many cancer cells as possible while hurting as few healthy cells as possible. But chemotherapy can't tell the difference between cancer cells and healthy cells. Many side effects of chemo are caused from damage to healthy cells.

Goals of chemo treatment

Chemotherapy is used in cancer treatment for different reasons:

- To try to cure the cancer
- To control the cancer (by shrinking or slowing down the tumor)
- To decrease side effects caused by the cancer (sometimes called palliative chemo)

Will chemo be the only cancer treatment I need?

Sometimes chemo is the only treatment needed. Other times, it's part of a treatment plan that can include surgery and radiation therapy. Chemo can also be used with other medicines like immunotherapy, targeted drug therapy, or hormone therapy.

Here are some ways chemo might be used with other cancer treatments:

- To shrink a tumor before surgery or radiation (called **neoadjuvant** therapy)
- After surgery or radiation to kill any cancer cells that might be left (called **adjuvant** therapy)
- With other cancer treatments like targeted drug therapy or immunotherapy to help them work better
- With other treatments if cancer comes back or doesn't completely go away

What is a chemo treatment plan?

Your cancer care team looks at guidelines from experts, as well as studies that show which treatments work best for your cancer. Then you and your doctor can discuss the pros and cons of each choice. Your treatment plan will depend on several things.

- The type of cancer
- The stage of cancer (how big it is and if it has spread)
- Lab tests and other special testing that might have been done on your tumor
- Your age and overall health
- Other health problems (such as heart, liver, or kidney disease)
- If you've had other kinds of cancer treatment before
- Your personal choices

You might get more than one kind of chemo, or you might get another kind of treatment with your chemo.

How often you get chemo and how long it lasts depends on the kind of cancer you have, what treatments are used, and how your cancer responds.

You might get chemo every day, week, or month, but it is usually given in an on-and-off schedule called a cycle. For example, a person might get chemo the first week, then have two weeks off before their next chemo treatment.

The on-and-off cycle gives your body time to heal and grow healthy new cells. If you have side effects from chemo, this also gives you time to feel better before your next cycle.

Ask your cancer care team how many chemo cycles are planned and how long they expect treatment to last.

How is chemo given?

Most chemo is given in one of these ways:

- **Oral:** A pill or liquid that you swallow
- **Injection:** A shot in your arm, leg, or belly (into the fat or muscle)
- **Intravenously (IV):** An IV infusion or IV push given into a vein
- **Topical/transdermal:** A cream, gel, or ointment that is rubbed on the skin

There are some other less common ways chemo can be given. Sometimes chemo may be given directly into the tumor, spinal fluid, or the space around the tumor.

What should I expect during my first chemo treatment?

Your first chemo appointment can be scary, especially if you don't know what to expect. It will depend on what chemo drug you're getting, where you're getting it, and if it's a shot or an

infusion. Before your appointment, ask if you can bring someone to be with you while you get chemo. Here are some general things you can expect from your first chemo appointment:

- You will check in and might have your height and weight checked. They might check your temperature, blood pressure, and heart rate, too.
- You might have a short appointment with someone from your cancer care team before treatment to make sure you are well enough to get chemo. If you have a central line like a port, they may access it (place a needle in it) at this time. If you don't have a central line, they may place an intravenous (IV) line in your arm.
- Some places have small private rooms and others use curtains to give people privacy. Every location is different. You can ask before your appointment how the chemo area is set up.
- You might get some medicines before your chemo (often called pre-meds). These often include medicines like acetaminophen (Tylenol), diphenhydramine (Benadryl), or steroids. They may be pills you swallow, or liquids placed in your IV.
- Bring something to keep you busy. You can bring a book, headphones, a game, or a laptop/tablet to pass the time while you get your chemo. Ask how long your appointment will be so you can plan ahead.

Chemo safety

Chemotherapy drugs can harm people who touch them. That's why there are safety precautions for people who handle chemo.

Nurses, pharmacists, or other health care professionals wear protective items when handling chemo. Other precautions might include wearing 2 pairs of special gloves and a gown, and sometimes goggles or a face shield.

Safety precautions after chemo

You might need to follow certain precautions during and after getting chemo. It usually takes 2 to 3 days for your body to get rid of most chemo. Most will be in your urine, but it can be in other body fluids like vomit, sweat, spit, and stool. It can also be in semen and vaginal fluids, so talk to your cancer care team before having sex.

Body fluids that have chemo can be harmful to other people and pets. If you take a chemo pill every day, the chemo will be in your body fluids for as long as you are taking it.

Your cancer care team will give you directions on what safety precautions to follow and for how long.

What about other treatments I've heard about?

When you have cancer, you might hear about other ways to treat the cancer or side effects. This might include things like vitamins, herbs, diets, acupuncture, and other treatments.

Some of these are known to help, but many haven't been tested. Some have been shown not to help. A few have even been found to be harmful. Talk to your doctor before you use anything, whether it's a vitamin, a type of diet, or something else.

How will I know if my chemo is working?

During treatment, you will see your cancer care team often. They might ask you about your symptoms, physically examine you, and order blood tests and imaging scans.

Ask your team to explain any test results to you, and how they show how your treatment is working.

What are the side effects of chemo?

Chemo kills cells that grow fast, even if they're not cancer cells. Some normal, healthy cells can also be harmed. This can cause side effects.

Most side effects go away over time after treatment ends. But some side effects might not go away at all. It's different for each person. Be sure to talk to your cancer care team. They can help you manage side effects. Some kinds of chemo cause more side effects than others.

Here are some of the more common side effects of chemo, things you can do for them, and when to call your cancer care team.

Fatigue

Fatigue (feeling very tired) is one of the most common side effects of chemo.

- Try to find a balance between moving your body and giving it rest. Take breaks when you need them.
- Ask your friends and family for help.
- Plan your days. Start with the biggest task first. Don't plan more than one big activity each day if you're too tired to do anything after.

- Certain medicines used to treat pain, nausea, or depression can make fatigue worse. Sometimes lowering the doses or changing to a different medicine can help. Talk with your cancer care team about this before making any changes to medications.
- Try to sleep 7 to 8 hours each night. Going to bed and waking up at the same time everyday can also help you sleep better.
- Avoid caffeine and alcohol.
- Avoid physical activity late in the evening.

Tell your cancer care team about your fatigue, especially if:

- You feel too tired to get out of bed for a 24-hour period.
- You feel confused, dizzy, lose your balance, or fall.
- You have problems waking up.
- You have problems catching your breath.
- Your fatigue is getting worse

Nausea and vomiting

Nausea (feeling sick to your stomach) and **vomiting** (throwing up) can lead to other problems, like not having an appetite, losing weight, or dehydration (when your body loses too much water).

- Eat small meals throughout the day so you don't have an empty stomach.

- Avoid greasy, spicy, or strong-smelling foods.
- Eat bland foods, such as dry toast and crackers.
- Eat food cold or at room temperature to reduce the smell and taste.
- Sip on clear fluids like water, broth, ginger ale, or tea.
- Try to avoid eating your favorite foods when you have nausea. It can ruin those foods for you after treatment.

Not all people who get chemo have nausea and vomiting. It depends on the type of cancer and the type and dose of chemo you get. Certain chemo drugs are more likely to cause nausea and vomiting than others.

If your doctor gives you medicine to help with nausea and vomiting, take it as directed. Tell your cancer care team right away if the medicine isn't working.

Even though medications are the main treatments for nausea and vomiting, there are some non-medication treatments that might also help.

Before using any of these treatments, check with your cancer care team to see if they are safe for you.

- **Hypnosis** can help make behavior changes to control nausea and vomiting. It creates a state of intense attention and readiness to accept an idea.

- **Relaxation techniques**, such as mindfulness (focusing on the present moment and observing your thoughts and feelings without judgment), breathing exercises, or progressive muscle relaxation (tensing and relaxing the muscles), can help decrease nausea and vomiting.
- **Biofeedback** helps a person learn to control a certain physical response of the body, such as nausea and vomiting. This is done by focusing on the moment-to-moment body changes that are linked to the physical response.
- **Guided imagery** helps people imagine that they are in a place that's relaxing for them. It can be a vacation spot, a room at home, or some other safe or pleasant place. While trying to imagine what they usually feel, hear, see, and taste in the pleasant place, some people can mentally block the nausea and vomiting.
- **Systematic desensitization** helps people learn how to imagine an anxiety-producing situation (such as nausea and vomiting) and reduce the anxiety related to it. In most cases, what a person can imagine without anxiety, they can then experience in the real world without anxiety.
- **Acupuncture** is a technique in which very thin needles are placed into the skin. There are a few different acupuncture techniques, including some that use pressure rather than needles (acupressure).

Tell your cancer care team if you:

- Are vomiting for several days
- Vomit blood or material that looks like coffee grounds
- Can't keep fluids or food down for more than a day because of vomiting
- Can't take medicines
- Are weak, dizzy, or confused
- Have dark yellow urine (pee) and don't urinate as often or as much

Hair loss

Certain treatments are more likely to cause **alopecia** (hair loss). Not everyone who gets chemo will lose their hair.

- Hair loss usually starts 1 to 3 weeks after starting treatment. But it can start to grow back even before treatment is over.
- Your new hair may grow back curlier or straighter, thicker, or finer – or even a new color. This is normal and can be temporary or long-term.
- Ask your cancer care team if your treatment is likely to cause hair loss. If it is, you might want to ask them about a cooling cap. Some people use cooling caps to prevent or decrease hair loss during chemo.
- Wigs might be covered by your insurance. Usually, your doctor must prescribe them as a “cranial prosthesis” for insurance to pay for them.

Low blood counts

The number of blood cells you have is also called your blood count. Chemo can decrease the number of blood cells you have. The blood cells that can be affected are red blood cells, platelets, and white blood cells.

If you don't have enough healthy red blood cells (RBCs), you have a condition called **anemia**. RBCs have hemoglobin (Hgb), which carries oxygen to tissues throughout the body.

Anemia can make you feel short of breath, weak, and tired. It can also make your skin, mouth, or gums look pale. If you are very anemic and having symptoms, your cancer care team might recommend a blood transfusion.

- Try to eat foods that have protein (such as fish, meat, eggs, cheese, milk, nuts, peas, and beans) and iron (such as dried fruit, beans, peas, lentils, leafy green vegetables, nuts, and seeds).
- Plan your most important activities for when you have the most energy.
- **Call your cancer care team if you're too tired to get around, feeling like you're going to pass out, having trouble breathing while resting, or having blood in your stool or vomit.**

If you have a low platelet count, you have a condition called **thrombocytopenia**. Platelets form blood clots that help stop bleeding and bruising. Your cancer care team might recommend a platelet or blood transfusion if they get too low or if you show signs of bleeding.

- When your platelets are low, you might bleed more than usual, even from small cuts. Be careful not to injure yourself.
- Use an electric razor.
- Avoid activities (such as football, skateboarding, or boxing) that might cause an injury or fall.
- Use a soft toothbrush. Ask your cancer care team if it's OK to floss.
- Avoid taking anti-inflammatory medicines or other medicines that thin your blood unless your cancer care team tells you to take them.
- **Call your cancer care team or get medical help if you have bleeding that won't stop.**

When you have low white blood cells, you have **neutropenia** (a weakened immune system). Not having enough white blood cells can increase your risk for infection.

- Wash your hands or use hand sanitizer throughout the day and before you eat or touch your face.
- Don't share cups or utensils with others.
- Try to avoid being around sick people or big crowds.
- **Tell your cancer care team right away if you're having signs or symptoms of an infection like fever, cough, chills, or sweats.**

If your blood counts go down because of chemo, they usually don't stay low for long. Blood tests will be done to make sure your counts are improving.

Mouth problems

Some chemo can cause sores in the mouth and throat (called **mucositis** or **stomatitis**). This can make it hard to eat and drink. Good mouth care is one of the best things you can do to lower the chance or severity of mouth sores.

- Brush your teeth with a soft toothbrush and mild toothpaste after every meal.
- Ask about mouth rinses you can use. Don't use mouthwash with alcohol.
- Try soft or bland foods that are easy for you to swallow.
- Avoid things that are spicy, have citrus, or hurt the inside of your mouth.
- Try popsicles or ice cream to soothe your mouth.

Sexual problems

Cancer and cancer treatment can change a person's sexual desire or body image. This is normal and common. Lots of things can make this happen while you're getting chemo. Stress, fatigue, pain, nausea, body image, and emotions can all cause sexual problems.

Sexuality and intimacy are just as important for people with cancer as they are for people who don't have cancer.

Even though sexual problems are common, health care providers don't always bring it up. So, it's important that you tell them if you're having problems. Some common sexual problems are hot flashes, vaginal dryness, irregular periods, yeast infections, low desire for sex, difficulty having an orgasm, and erectile dysfunction. If you've had genital herpes or warts in the past, chemo sometimes can cause a flare-up.

Fertility problems

Some kinds of chemo can make it difficult to have children (infertility). Infertility from chemo might be short-term or permanent. If you might want to have children someday, talk to your cancer care team **before you start treatment**.

Always use birth control during treatment to prevent pregnancy in yourself or your partner. People with certain cancers should not take hormonal birth control, so talk to your doctor about which kind you should use and how long you should take it.

Memory changes

Cancer and its treatment can affect your memory and thinking. It's sometimes called **chemo brain**. This might include forgetting things, trouble concentrating, or just feeling "foggy" or "cloudy." For most people, these changes are short-term, but for some people these changes might last longer.

Here are some things you can do to help manage chemo brain:

- **Use a daily planner, notebooks, reminder notes, or your phone.** Keeping everything in one place makes it easier to find the reminders you may need.
- **Exercise your brain.** Take a class, do word puzzles, or learn a new language.
- **Get enough rest and sleep.**
- **Keep moving.** Regular physical activity is not only good for your body, but also improves your mood, makes you feel more alert, and decreases tiredness (fatigue).
- **Set up and follow routines.** Try to keep the same daily schedule.
- **Pick a place for commonly used items** and try to put them there every time.
- **Avoid alcohol and other things** that might change your ability to think and focus.
- **Ask for help when you need it.** Friends and loved ones can help with daily tasks and save you physical and mental energy.

If you notice any memory changes or problems thinking, talk to your cancer care team. There are resources that can help you with exercises and other types of treatment to help these side effects. **If you notice sudden confusion or confusion that is getting worse, talk to your cancer care team right away.**

Emotional changes

Feelings of anxiety, depression, or even anger are common. These kinds of thoughts, feelings, and emotions are sometimes called **distress**. Chemo changes your life and can make it harder to get things done. Your relationships with friends and family might feel different.

Here are some tips that might be helpful for managing distress:

- Use ways of coping that have helped you in the past. For some people, that might include talking with a friend, listening to music, meditation, or praying.
- Deal with cancer one day at a time. Breaking things up into smaller time periods can make it feel less overwhelming.
- Counselors, therapists, chaplains, and support groups can also be very helpful and remind you that you aren't alone.
- Write down how you're feeling. Sometimes just getting it out of your head and written on paper can relieve distress.

Distress can cause serious problems and shouldn't be ignored. Your cancer care team is there to treat you as a whole person, not just your cancer. They can suggest resources to support you.

Long-term and late side effects

Some chemo drugs may cause side effects that don't go away completely (long-term) or show up for months or years (late) after treatment. Some of the most common long-term or late side effects are:

- Heart problems
- Not being able to have children
- Kidney problems
- Peripheral neuropathy (numbness, tingling, or pain in the hands or feet)

Ask your cancer care team if there are long-term or late side effects of the chemo you're getting.

Will I be able to work during treatment?

Some people work during treatment, and others don't. It depends on your situation, if you've had surgery or other treatments, and the kind of work you do.

Talk to your cancer care team about your plans for work during treatment. They can make suggestions based on your treatment plan and possible side effects.

If you decide to take some time off from work, talk to your supervisor or human resources team. Check with your insurance company about coverage, and check your state's family and medical leave laws (FMLA).

Other questions you might want to ask about chemo

- What chemo drugs will I be getting?
- How soon do I have to decide?
- How often will I get them?
- How and where will they be given?
- Can I bring someone with me to my appointments?
- What's the goal of chemo for my cancer?
- How will we know if it's working?
- What are the possible side effects of this chemo?
- Can I do anything to prevent side effects or get ready for chemo?
- Will this chemo affect my ability to have children? If so, are there options for fertility preservation?
- Will I be getting other treatments before, during, or after chemo?
- How do I know if my insurance covers this chemo?

If chemotherapy is part of your treatment, talk to your cancer care team about what to expect. It's important to keep track of any side effects you're having so your cancer care team can help you manage them.





This booklet has information on chemotherapy. It tells you things like:

- What chemo is and how it works
- How chemo is given
- Common side effects and ways to manage them
- Keeping your family and friends safe while you get chemo
- Questions you might want to ask your cancer care team so you can know what to expect

To learn more about chemotherapy, visit the American Cancer Society website at **cancer.org/chemo** or call us at **1-800-227-2345**. We're here when you need us.



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