

About Chemotherapy

Chemotherapy (often just called "chemo") refers to medications that kill actively dividing cells. Unlike healthy cells, cancer cells grow continuously because they don't respond to normal signals that control cell growth. Chemotherapy works by disrupting cell division and killing actively dividing cancer cells. In contrast to [radiation therapy](#), which destroys cancer cells in a specific area of the body, chemotherapy works to treat cancer throughout the body.

If your child has been diagnosed with cancer, doctors will develop a customized treatment plan that takes into account your child's age, the type of cancer, and where it's located. A pediatric oncologist (a doctor who specializes in the treatment of childhood cancer) will work with other health care professionals to determine the chemotherapy regimen that's best for your child.

How Chemotherapy Is Given

Just as other medicines can be taken in various forms, there are several ways to get chemotherapy. In most cases, it's given intravenously into a vein, also referred to as an IV. An IV is a tiny tube inserted into a vein through the skin, usually in the arm. The IV is attached to a bag that holds the medicine. The chemo medicine flows from the bag into the vein, which puts the medicine into the bloodstream. Once the medicine is in the blood, it can travel through the body and attack cancer cells.

Sometimes, a permanent IV called a catheter is placed under the skin into a larger blood vessel of the upper chest. That way, a child can get chemotherapy and other medicines through the catheter without having to always use a vein in the arm. The catheter remains under the skin until all the cancer treatment is completed. It also can be used to obtain blood samples and for other treatments, such as blood transfusions, without repeated needle sticks.

Chemo also can be:

- taken as a pill, capsule, or liquid that is swallowed
- given by injection into a muscle or the skin
- injected into spinal fluid through a needle inserted into a fluid-filled space in the lower spine (below the spinal cord)

Chemotherapy is sometimes used along with other cancer treatments, such as radiation therapy, surgery, or biological therapy (the use of substances to help the body's immune system fight cancer).

Lots of kids and teens receive combination therapy, which is the use of two or more cancer-fighting drugs. In many cases, combination therapy lessens the chance that the cancer will become resistant to one type of drug — and improves the chances that the cancer will be cured.

When and Where Chemo Is Given

Depending on the method used to administer chemotherapy, it may be given at a hospital, cancer treatment center, doctor's office, or at home. Many kids receive chemotherapy on an outpatient basis at a clinic or hospital. Others may need to be hospitalized to monitor or treat side effects.

Kids may receive chemotherapy every day, every week, or every month.

Doctors sometimes use the term "cycles" to describe a chemotherapy schedule

because treatment periods alternate with periods of rest so a child can recover and regain strength.

Common Side Effects of Chemotherapy

Although chemo often effectively damages or eliminates cancer cells, it also can damage normal, healthy cells. This can lead to [side effects](#).

Chemotherapy side effects are different for each child. The type of anticancer drug used, the dose, and a child's general health affect the risk of developing side effects. The good news is that most side effects are temporary — as the body's normal cells recover, the side effects gradually go away. It's also important to remember that doctors have ways of helping with many common side effects of chemotherapy.

Cancer treatment is multifaceted — that is, patients receive a lot of care (i.e., fluid and nutrition support, transfusion support, physical therapy, and medicines) to help them tolerate the treatments and treat or prevent side effects such as nausea and vomiting.

It's difficult to predict which side effects a child might experience, how long they'll last, and when they'll end. If your child has side effects, be sure to talk with your doctor about how to cope with them.

Fatigue

Fatigue is the most common side effect of chemotherapy. Kids may need to reduce or eliminate activities during chemo, and may feel very tired even after sleeping and resting. Fatigue may last for days, weeks, or months, but it does go away once treatment is over.

Encourage your child to rest and sleep as often as possible — even if it doesn't immediately result in more energy — because rest helps the body recover from chemo. Short naps or breaks from activity may be more beneficial than longer ones.

Discomfort and Pain

There may be some initial discomfort when a chemotherapy catheter or IV needle is placed in the vein. Certain anticancer drugs also cause mouth pain, headaches, muscle pains, and stomach pains. Chemo medicine may cause temporary nerve damage, which can result in burning, numbness, tingling, or shooting pain in the fingers and toes.

Kids taking pain medication should not skip doses — waiting until pain is bad can make it harder to control. If your child's pain persists or worsens at any time, talk to your doctor. Also, be sure to discuss the use of alternative or over-the-counter medicines and vitamins. There may be drug interactions with chemo you want to avoid.

Skin Damage or Changes

Skin may be red, sensitive, or easily irritated in the days, weeks, and months during and after treatment. If your child had radiation therapy prior to chemotherapy, the treated skin may turn red, blister, and peel once chemo begins. This condition is known as "radiation recall."

A child who has sensitive or irritated skin should wear loose, soft clothes and avoid using lotions or other commercial products on the affected area. Your doctor may recommend an ointment or cream to reduce irritation. Prolonged sun exposure should be avoided. If your child is going to be outside, speak with the doctor about using sunscreen.

Common Side Effects (continued)

Hair Loss and Scalp Sensitivity

Because chemotherapy often kills the healthy cells responsible for hair growth, it's common for kids undergoing chemo to lose their hair or have a sensitive scalp.

Hair thinning and hair loss may occur all over the body during treatment, including the head, face, arms and legs, underarms, and pubic area. Your child's hair may become thinner and then fall out completely or in clumps. [Losing hair can be scary](#) for kids and make them feel nervous about standing out. Getting a shorter haircut may make it less traumatic once hair loss starts. Your child may also feel more comfortable wearing hats, bandannas, baseball caps, scarves, or wigs until the hair grows back. And it will grow back. Most kids' hair regrows before treatment ends or within 3 months following its end, though it may be a slightly different color or texture than it was before. To protect the head from sun exposure, have your child wear a hat and sunscreen while outside. Even if your child doesn't have hair loss, using mild shampoo and other hair products can help prevent scalp irritation.

Mouth, Gum, and Throat Sores

Chemotherapy may cause sores in the mouth, gums, and throat or cause gum tissues to become irritated and bleed. The doctor may prescribe a mouth rinse or other products to reduce pain, dryness, and irritation.

Be sure to take your child for regular dental checkups and follow the dentist's advice on how to brush the teeth during chemotherapy. Kids with mouth or throat pain may find soft, cool foods easier to chew and swallow; acidic foods and juices should be avoided.

Gastrointestinal Problems

Gastrointestinal problems (including loss of appetite, constipation, diarrhea, nausea, and vomiting) can occur, although medications can help prevent or reduce nausea and vomiting. Talk to your doctor about medicines or dietary changes that may help ease an upset stomach, prevent weight loss, or combat constipation.

If your child doesn't feel like eating a large meal, try serving small meals throughout the day. And be sure to offer foods high in nutrients to prevent weight loss. Avoid serving fatty, sweet, spicy, or fried foods. And even though your child may not feel like drinking, water, clear broth, juices, and sports drinks can replace fluids lost through vomiting and diarrhea. Room-temperature beverages may be easier to drink than hot or cold liquids. The doctor or a registered dietitian may have suggestions for ensuring adequate nutrition and hydration.

Urinary System Problems

Some chemotherapy drugs can irritate or damage the bladder or kidneys and can cause the urine (pee) to change color or take on a strong odor for a day or two. The doctor may ask for a blood or urine sample before beginning chemotherapy to evaluate kidney function.

Giving your child plenty of fluids to drink will ensure good urine flow and help prevent problems in the urinary tract. Be sure to let the doctor know if your child develops symptoms that may indicate a problem with the urinary system,

such as painful or frequent urination, reddish or bloody urine, or an inability to urinate.

Common Side Effects (continued)

Central Nervous System Problems

Chemotherapy may cause temporary confusion and depression, which should go away once treatment is completed.

Decreased Blood Counts

- **Low hemoglobin (anemia)** The doctor will monitor your child's blood counts to check for [anemia](#) (low levels of red blood cells, which are made in the bone marrow and carry oxygen throughout the body). Kids with anemia may feel tired or have a headache. Red blood cell transfusions may be necessary.
- **Low platelets (thrombocytopenia)** Chemotherapy drugs may inhibit the body's ability to produce platelets, which help blood to clot. Your child may bleed or bruise easily because of a reduction in platelets. Platelet transfusions may be necessary.

Increased Risk of Infection

Chemo can deplete white blood cells, which are part of the immune system and help the body fight infection. This can increase the [risk for infections](#) both during and after treatment. To help protect your child:

- Remind everyone in your family to wash their hands before eating, after using the bathroom, and after touching animals. They shouldn't share cups or utensils with friends or family members.
- Friends and family members with contagious illnesses (such as a cold, the flu, or chickenpox) should not visit. Try to avoid crowds and children who have received certain vaccines, such as chickenpox, oral polio, and the flu nasal spray — these are live virus vaccines and can spread disease to kids with low blood cell counts. Your child also shouldn't receive immunizations without your doctor's OK.
- To prevent foodborne infection, your child shouldn't eat raw fish, seafood, meat, or uncooked eggs.

Long-Term Side Effects Chemotherapy can cause long-term side effects (sometimes called [late effects](#)), depending on the type and dose of chemotherapy and whether it was combined with radiation. These effects may involve any organ, including the heart, lungs, brain, kidneys, liver, thyroid gland, and reproductive organs. Some types of chemotherapy drugs may also increase the risk of cancer later in life.

Receiving chemo during childhood also may place some kids at risk for delayed growth and cognitive development, depending on the child's age, the type of drug used, the dosage, and whether chemotherapy was used in addition to radiation therapy.

Report any side effects to your doctor so that they can be treated and your child made as comfortable as possible.

Caring for Your Child

Your child may have many questions about cancer and its treatment. Be honest when talking about it — discuss the disease in age-appropriate terms and encourage your child to share his or her feelings. And remember that

you're not alone: Doctors, nurses, psychologists, psychiatrists, social workers, child-life therapists, and other members of the cancer treatment team are there to answer questions and support you and your child before, during, and after chemotherapy.

Kids who are scared about starting chemo might benefit from a tour of the hospital or clinic beforehand or joining a support group for families coping with childhood cancer. Besides making treatment seem less frightening, meeting other cancer patients and survivors might help your family develop a network of friends and supporters dealing with the same issues.

Also remember to [care for yourself](#) during your child's treatment. Don't be afraid to ask for help from family and friends, both early in your child's treatment and later on. Caring for yourself will help you to care for your child as well as you possibly can.

Once chemo is done, it's still important for the doctor to monitor your child's health and progress in follow-up appointments. During these checkups, the doctor will ask if there are continuing side effects and check for any signs of the cancer recurring.

It can be difficult to cope with a cancer diagnosis, let alone take in facts about chemotherapy. Remember that while it can be a long road, children and teens treated for cancer often go on to lead long, healthy, and happy lives.

<http://kidshealth.org/en/parents/chemotherapy.html?WT.ac=ctg#>