

Health / Patient Advice / How Chemotherapy Works

What Is Chemotherapy and How Does It Work?

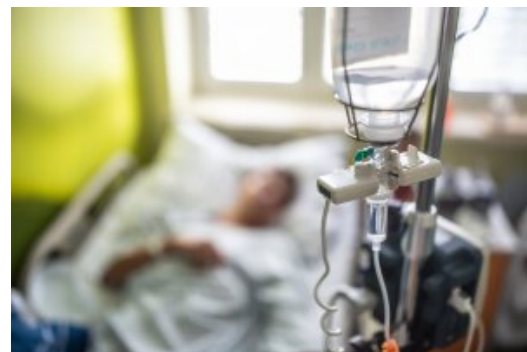
Learn more about the basics of chemotherapy, how it works and what to expect.

By [Payton Sy, RN](#) | March 28, 2024 |

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Hearing the words, “You have cancer,” can be one of the most difficult experiences someone can go through. While processing the gravity of such a diagnosis, it’s natural to wonder what to expect with your treatment plan.

Medical advancements today make it so [cancer](#) is often treatable, and recovery is possible. Here are the basics of what to know about chemotherapy, preventative chemotherapy and its side effects.

▶▶ **SEE:** [Questions to Ask Your Oncologist at Your First Cancer Appointment.](#)

What Is Chemotherapy?

Chemotherapy is a common treatment for cancer. Since cancer is a condition of uncontrolled and abnormal cell growth in the body, chemotherapy aims to target and destroy these rapidly dividing cells to halt disease progression. In some cases, chemotherapy may administered for non-cancerous autoimmune conditions, like [rheumatoid arthritis](#) or [lupus](#).

Many popular chemotherapy drugs, like Doxorubicin and Carboplatin, for example, work by disrupting DNA, preventing cell reproduction and causing cell death.

Various chemotherapy treatments can target different cancers, and often multiple chemotherapy drugs are given in combination with one another, which is called combination therapy. Chemotherapy is commonly given in regular intervals called cycles since it's hard on the body. During a chemotherapy cycle, cancer cells, along with many healthy cells, die. After the cycle, the body starts to repair healthy cells again, giving time to prepare for another round of chemotherapy.

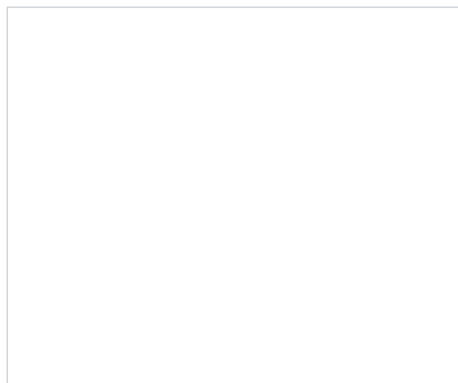
Chemotherapy drugs can be administered in different ways, such as:

- Orally in pill or capsule form.
- Intravenously, called chemotherapy infusions, which are administered by needle, catheter, port or pump. Port placement requires minor surgery.
- Chemotherapy shots that are injected with a needle.
- Chemotherapy cream or gels that are applied on the skin for certain types of skin cancer.
- Chemotherapy drugs targeted to a specific part of the body. For example, chemotherapy drugs can be given directly in the abdomen, bladder, chest cavity or central nervous system. One form is hyperthermic intraperitoneal chemotherapy. It puts heated chemotherapy in your abdomen after surgery.

A treatment session can take anywhere from a few minutes to a few hours. Some people need a continuous infusion, which can last several days.

Who Needs Chemotherapy?

Chemotherapy is a key treatment option for individuals with cancer. Cancer may be identified through imaging, biopsies, surgeries or pathology reports.



However, surgeons don't always find cancer during an initial investigative operation.

"The rate of undetected, 'occult' cancer found on final pathology when no visible cancer is found at the time of surgery has been reported to be as low as 1% and as high as 10%," says Dr. Aakash Gajjar, a colorectal surgeon at Memorial Hermann Health System in Houston. This is seen sometimes in [ovarian cancers](#), thyroid cancers, [brain cancers](#), [pancreatic cancers](#) and other types of gastrointestinal cancers, he adds.

Cancer doctors base their treatment plans, dosage and chemotherapy cycle on evidence-based guidelines, like guidelines from the National Comprehensive Cancer Network. Sometimes doctors may deviate from NCCN guidelines, "if there is new evidence that has not made its way into publication just yet, or if there are new clinical trials available for patients," Gajjar says.

A medical oncologist oversees chemotherapy treatment. These health care providers specialize in chemotherapy and other cancer-fighting drugs.

The type of chemotherapy [oncologists](#) would recommend depends on several factors, including:

- Type of cancer.
- Stage of the cancer.
- Aggressiveness of the cancer.
- Molecular and genetic profile of the tumor.
- The patient's overall health.
- The patient's wishes and treatment goals.

Types of Chemotherapy

There are various purposes for chemotherapy.

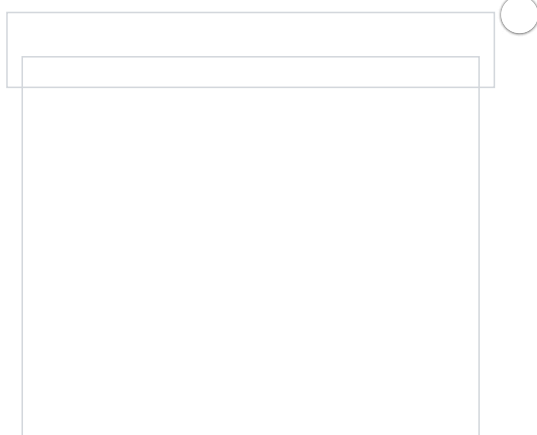
- **Curative chemotherapy:** The goal of curative chemotherapy is to rid the body of all cancer cells to achieve complete remission.
- **Neoadjuvant therapy:** You can think of this treatment as a preparation for the main cancer treatment. The goal of neoadjuvant chemotherapy is to shrink a tumor prior to surgery or radiation.
- **Palliative chemotherapy:** This treatment aims to improve quality of life by diminishing cancer symptoms, but the goal isn't to rid the body of all the cancer. This is a comfort measure at the end of life, in collaboration with a hospice or palliative care provider.
- **Preventative or adjuvant chemotherapy:** After treatment of curative intent, like surgery or radiation therapy, preventative chemotherapy is another tool in the arsenal to ensure any lingering cancer dies.

▶▶ **See:** [Colon Cancer Diet](#).

What Is Preventative Chemotherapy?

Preventative chemotherapy is done to decrease the chance of cancer coming back after treatment of curative intent, like surgery to remove the cancer, Dr. Frank Tsai, oncologist and researcher at HonorHealth Research Institute in Scottsdale, Arizona explains. This is also referred to as adjuvant chemotherapy, meaning it's intended to prevent cancer recurrence.

Doctors typically recommend preventative chemotherapy after a surgery where the cancer is further along, where lymph nodes are involved or the cancer has spread to other organs. Or, if aggressive cancer features are identified later on through tumor testing called biomarker testing, explains Dr. Monique Gary, a breast surgical oncologist and medical director of the Grand View Health cancer program in Sellersville, Pennsylvania. She says cancers that are found at stage zero or in situ, meaning the cancer has not spread, do not require chemotherapy.



Tsai adds, “the first step is to meet with the patient and talk about the plan for chemotherapy. We base this on what type of cancer the patient has, how much benefit preventative chemotherapy has been shown for their cancer, if it improves survival rate, what the side effects are and what the impact will be on their lifestyle.”

Preventative chemotherapy is only done in certain cancers where research has shown it to benefit patients, which may include, but are not limited to:

- [Breast cancer.](#)
- Lung cancer.
- Pancreatic cancer.
- Colon cancer.

▶▶ **SEE:** [Colon Cancer Symptoms That Are Easily Overlooked.](#)

What Are the Side Effects of Chemotherapy?

Because chemotherapy kills not only the cancer cells but also healthy cells, there are many side effects.

Side effects vary from person to person, says Dr. Misagh Karimi, a medical oncologist at City of Hope Orange County in California.

For example, certain types of chemotherapy – like Oxaliplatin used to treat colon cancer – may cause sensitivity to cold, including chilly weather and cold beverages. Patients experiencing temperature side effects will be advised to avoid icy or cold drinks. Tastes can also change during treatment, and once-favorite foods may seem “off.”

Karimi says some side effects might include:

- Fatigue.
- Nausea.
- Vomiting.

- [Diarrhea](#).
- Upset stomach.
- Hair loss.
- Fever.
- Pain.
- [Constipation](#).
- Infection.
- Loss of appetite.
- Neuropathy, which is numbness, tingling or weakness due to nerve damage.
- Sores in the mouth or throat.
- Heart damage.
- Fertility issues.

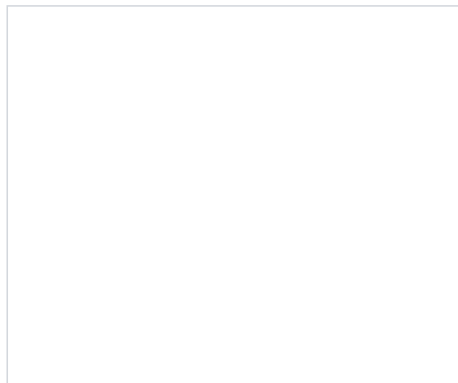


To mitigate these symptoms, your doctor may prescribe you medications to counteract some of the symptoms.

To off-set the side effects from chemo, Karimi also suggests:

- Eating a [balanced diet](#) of foods that are bland and easy to digest, like oatmeal. Frozen grapes or melon balls are worth a try for mouth sore, if cold sensitivity isn't an issue.
- Doing gentle exercise, like yoga or walking.
- Drinking plenty of fluids.

Always follow the advice of your medical provider before trying any home remedies. "For example, we know that some vitamins can make chemotherapy less effective," Karimi warns.



Long-Lasting and Later-Developing Side Effects of Chemotherapy

Due to the intensity of chemotherapy, there may be lasting or later-developing side effects throughout your life. Prior to receiving chemotherapy, your medical provider will weigh these risks against the risk of your cancer being left untreated, as well as your personal wishes, expected quality of life and prognosis.

According to the National Cancer Institute, some of these risks include:

- Bone loss.
- Brain or cognitive changes.

- Hormonal changes.
- Eye problems.
- Hearing problems.
- Heart problems.
- Joint changes.
- Lung problems.
- Mouth changes.
- Lymphedema, or swelling of the lymph tissue.



• Changes in mental health, like developing post-traumatic stress disorder due to the hardships of treatment. The most effective remedy to combat these side effects is to establish a dependable care team. During and after cancer treatment, keep up with your primary care provider, dentist, specialists, audiologists and mental health providers in addition to your cancer doctors. Having regular check-ups and following recommendations from your care team ensures you will maintain the best quality of life possible even after completing treatment.

The Bottom Line

Chemotherapy is a treatment that makes remission and recovery from cancer possible.

With precision oncology, we can look at tumor cells early on and understand how aggressively they may behave in the body. This can help determine the potential benefits of chemotherapy, Gary explains. “It’s important for people of all ages, and in particular younger women, to pay attention to their bodies and understand what is normal to them,” Gary urges. “Do not dismiss your symptoms.”

Frequently Asked Questions

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Tsai is an oncologist and researcher at HonorHealth Research Institute in Scottsdale, Arizona.

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