

What Is Immunotherapy? Cancer and the Immune System

Immunotherapy is a type of cancer treatment that helps your immune system fight cancer. The immune system normally detects and destroys abnormal cells, but cancer cells have ways to avoid it. Immunotherapy helps the immune system act more strongly against cancer. There are several types, including checkpoint inhibitors and monoclonal antibodies.

This page is for anyone who has been offered immunotherapy or wants to understand it. It explains how it works, the main types, what treatment is like, and which side effects to watch for.

The simple version

Immunotherapy is a cancer treatment that helps your immune system fight cancer. The immune system helps your body fight infections and other diseases. It is made up of white blood cells, plus the organs and tissues of the lymph system.

Immunotherapy is a type of biological therapy. That means a treatment that uses substances made from living organisms to treat cancer.

Immunotherapy helps your own immune system act against cancer.

How it works against cancer

Part of the immune system's normal job is to find and destroy abnormal cells. It most likely prevents or curbs the growth of many cancers. Immune cells are sometimes found in and around tumors, for instance. These cells are called tumor-infiltrating lymphocytes (TILs). They are a sign that the immune system is responding to the tumor.

The immune system can prevent or slow cancer growth. But cancer cells have ways to avoid destruction. For example, cancer cells may:

- have genetic changes that make them less visible to the immune system
- have proteins on their surface that turn off immune cells
- change the normal cells around the tumor so they interfere with how the immune system responds

Immunotherapy helps the immune system to better act against cancer.

The types of immunotherapy

Several types of immunotherapy are used to treat cancer:

- **Immune checkpoint inhibitors** are drugs that block immune checkpoints. Checkpoints are a normal part of the immune system. They keep immune responses from being too strong. Blocking them lets immune cells respond more strongly to cancer.
- **T-cell transfer therapy** boosts the natural ability of your T cells to fight cancer. Immune cells are taken from your tumor. The most active ones are selected or changed in the lab, then grown in large batches. They go back into your body through a needle in a vein. It may also be called adoptive cell therapy.
- **Monoclonal antibodies** are immune system proteins created in the lab. They are designed to bind to specific targets on cancer cells. Some mark cancer cells so the immune system can better find and destroy them.
- **Treatment vaccines** work against cancer by boosting your immune system's response to cancer cells. They are different from vaccines that help prevent disease.
- **Immune system modulators** enhance the body's immune response against cancer. Some affect specific parts of the immune system. Others affect it more generally.

Which cancers it treats

Immunotherapy drugs have been approved to treat many types of cancer. Want to know whether immunotherapy may be used for a specific cancer? The National Cancer Institute provides adult and childhood cancer treatment summaries.

What to expect

How it is given. Immunotherapy may be given into a vein (IV). It may be given as pills or capsules you swallow (oral). It may be a cream you rub on your skin (topical, which can be used for very early skin cancer). Or it may go directly into the bladder (intravesical).

Where you go. You may receive immunotherapy in a doctor's office, a clinic, or an outpatient unit in a hospital. Outpatient means you do not spend the night in the hospital.

How often. How often and how long you receive immunotherapy depends on several things. Your type of cancer and how advanced it is. The type of immunotherapy. And how your body reacts. You may have treatment every day, week, or month. Some types are given in cycles — a period of treatment followed by a period of rest. The rest gives your body a chance to recover and respond.

How you will know if it is working. You will see your doctor often for physical exams, and to be asked how you feel. You will have medical tests, such as blood tests and different types of scans. These measure the size of your tumor and look for changes in your blood work.

Side effects and why they happen

Immunotherapy can cause side effects. Many happen because the immune system has been revved up to act against the cancer. It then also acts against healthy cells and tissues in your body.

Side effects can happen when the boosted immune system affects healthy cells too.

The inflammation can appear in places such as the bowel (colitis), lungs (pneumonitis), liver (hepatitis), pancreas, heart muscle, kidneys, or hormone glands such as the thyroid and pituitary. NCI says doctors cannot know for sure when or if side effects will occur or how serious they will be. Ask your team which symptoms to report and how urgently.

For a practical symptom-focused page, see immune-related side effects. Is immunotherapy being discussed because of a test result? Then PD-L1 TPS, PD-L1 CPS, MSI-H, and TMB-high are common report terms to ask about.

What researchers are working on

Clinical trials are testing immunotherapy. To look for one, use NCI's clinical trials search or call 1-800-4-CANCER.

When to get help sooner

- **Call 911 or go to an emergency department if** you cannot catch your breath while sitting still, or your chest hurts. Confusion, collapse, or sudden severe weakness also needs emergency care, because these can be signs of a serious reaction. Do not drive yourself.
- **Call your care team right away, at any hour, if** you see blood in your stool.
- **Call your care team the same day if** you are passing several more loose stools a day than usual, or you see mucus in them. A new or louder cough, or yellowing of the eyes or skin, also counts as same-day.
- **Call your care team within a day or two if** a rash spreads or itches badly. The same applies if you feel thirsty and are urinating far more than usual, or you feel unusually cold, flat, and tired. These can be the first hints of inflamed glands, and they are easier to treat early.

Sources: [National Cancer Institute: immunotherapy side effects](https://www.cancer.gov/about-cancer/treatment/types/immunotherapy/side-effects) (cancer.gov/about-cancer/treatment/types/immunotherapy/side-effects).

Source: National Cancer Institute (cancer.gov/about-cancer/treatment/types/immunotherapy)

Last updated: 2026-08-11

Online: cancerexplained.org/treatments/immunotherapy

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