

# Understanding Cancer Tests



Healthcare providers use tests, such as blood tests, mammograms, MRIs, PET scans, CT scans, and biopsies, to help them screen for, diagnose, treat, and monitor cancer. If you've been diagnosed with cancer, you may have had 1 or more of these tests. You may have wondered why you had certain tests and not others, and what exactly the healthcare provider was looking for.

## Why do I need to be tested?

There are many reasons why you may need certain tests done. Tests may be done to:

- **Screen for cancer.** Screening tests are done in people without any symptoms as a way to find a cancer early, when it's small and hasn't spread beyond where it started. Examples are the Pap smear to screen for cervical cancer and mammograms to screen for breast cancer.
- **Help diagnose and stage the cancer.** If your healthcare provider thinks that you may have cancer, tests will be needed to help diagnose and stage the cancer (find out how big it is and how far it has spread). For instance, a chest X-ray, CT scan, and biopsy might be done for someone with symptoms that could be caused by lung cancer.
- **Guide cancer treatment.** Sometimes tests are used during treatment to help guide or direct the surgery or radiation that's being done. An example of this might be MRI-guided brain surgery. In this surgery, an MRI is used to create images that help the surgeon remove the tumor and limit damage to the nearby tissues.
- **Keep track of cancer and its treatment.** If you've been diagnosed with cancer or if you have had treatment for cancer, your healthcare provider will use tests to keep track of the cancer, see if it has come back, or to check for side effects of the treatment. An example of this might be checking the prostatic-specific antigen levels in someone who has been treated for prostate cancer.

## What types of tests are there?

There are many different kinds of tests that can be used. Some tests are done on a sample of your blood, urine, or tissue. Others are done on your whole body (such as an X-ray or CT scan). Most of the time, more than 1 test is done to diagnose or keep track of cancer. Many of the tests used are not cancer-specific, but some are.

## Biopsies

A biopsy is when a tissue or cell sample is checked for cancer. A biopsy is often the only way to tell for sure if you have cancer. There are many types of biopsies. The type you have will depend on the type of cancer your healthcare provider is checking for. Common types of biopsies include:

- **Fine needle biopsy.** A thin, hollow needle is used to remove a small cell or tissue sample.
- **Core needle biopsy.** A slightly larger needle is used to remove a larger sample of tissue.
- **Excisional biopsy.** A surgeon removes the entire tumor.
- **Incisional biopsy.** A surgeon removes part of the tumor.
- **Endoscopic biopsy.** A tissue sample is removed with the help of an endoscope (a thin, flexible tube with a light and camera at the end). For example, a biopsy may be taken during a colonoscopy to check for colon cancer.

## Tumor markers

The cancer or the body's response to the cancer may make substances that can be measured. They may only be made for 1 or more types of cancer. Or they may be caused by noncancer (benign) problems. Some of the markers are used more in keeping track during and after treatment. In this case, your healthcare provider is looking for changes in the marker levels over time. Here are some common molecular markers:

Selected tumor markers    Cancers that can cause increased levels

Alpha-fetoprotein	Liver and germ cell cancers of the ovary or testicle
CA 15-3	Breast cancer
CA 19-9	Pancreatic, some colon, and biliary tract cancers
CA 27-29	Breast cancer
CA 125	Ovarian cancer
Carcinoembryonic antigen	Colorectal, pancreatic, lung, breast, and ovarian cancer
Human chorionic gonadotropin	Choriocarcinoma or gestational trophoblastic disease (a rare type of uterine cancer involving placental tissue) and germ cell cancers of the ovary or testicle
Prostate-specific antigen	Prostate cancer

Molecular tumor markers may be measured in blood, urine, or tissue tests. They're used along with other tests to diagnose and keep track of treatment. The usefulness of tumor markers depends on the stage and specific subtype of cancer. There are many other tumor marker tests that might be used.

## Imaging tests

Imaging tests are used to find cancer inside the body. They're used to find the stage of the cancer and can help focus treatment (such as radiation or surgery) to the part of the body with cancer. Here are some common imaging tests:

Imaging test	How it works
CT scan	A computer uses X-rays to make detailed horizontal (axial) images of the inside of the body.
PET scan	A radioactively linked sugar is injected into the bloodstream. Images are then taken to see where sugar collects in the body. Since cancer cells take up more sugar than healthy cells these images can find the cancer.
MRI	Radio waves in a strong magnetic field are used to make a computer-generated, detailed image of the inside of the body without the use of X-rays.
Radionuclide imaging	The person is given radioactively linked substances as an injection into the blood or by mouth (orally). Images are then taken to see where the body is using these substances (for instance, bone, liver, or thyroid scans).
Ultrasounds	High energy sound waves are used to create pictures of the inside of the body.
X-rays	Low doses of radiation are used to create a 2-dimensional image of the inside of the body.

These questions may be helpful when talking with your healthcare provider about tests:

- What tests do you think I need?
- What will the test tell us?
- What's it like to have the test?
- Are there any special preparations needed for the test?
- Are there any risks from the test?
- How long does it take to get the results?
- How will the information you get from the test help?
- What other tests might be needed?

No test is 100% perfect. Sometimes a cancer is missed when it's really there (false negative). Or it may look like a person has cancer when they don't (false positive). Researchers are working on better, more sensitive tests to help diagnose, treat, and keep track of cancer.

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