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Imaging (Radiology) Tests for Cancer

Doctors use imaging tests to take pictures of the inside of your body. Imaging tests can be used to look for cancer, find out how far it has spread, and to help see if cancer treatment is working.

What are imaging tests?

An imaging test is a way to let doctors see what's going on inside your body. These tests send forms of energy (like x-rays, sound waves, radioactive particles, or magnetic fields) through your body. Your body tissues change the energy patterns to make an image or picture. These pictures show how your insides look and work so that health care providers can see changes that may be caused by diseases like cancer.

What are imaging tests used for?

Imaging tests are used for cancer in many ways:

- They are sometimes used to look for cancer in its early stages (when it's small and has not spread), and a person has no symptoms. This may be called [early detection](#)¹ or cancer screening tests.
- They can be used to look for a mass or lump (tumor) if a person has symptoms. They can also help find out if the symptoms are caused by cancer or by some other type of disease.
- They can sometimes help predict whether a tumor is likely to be cancer. This can help health care providers decide if a [biopsy](#)² is needed. (In a biopsy, a small piece of tissue is taken out and looked at under the microscope.) A biopsy is almost always needed to know for sure that a change is cancer.
- They can show where the tumor is, even deep inside the body. This helps if a

biopsy is needed.

- They can help find out the [stage](#)³ of the cancer (figure out if and/or how far the cancer has spread).
- They can be used to plan treatment, such as showing where radiation therapy beams need to be focused.
- They can show if a tumor has shrunk, stayed the same, or grown after treatment. This can give the cancer care team an idea of how well treatment is working.
- They can help find out if a cancer has come back (recurred) after treatment.

Imaging tests are only part of cancer diagnosis and treatment. A complete cancer work-up also includes talking about your medical history (asking questions about your symptoms and risk factors), a physical exam, and blood work or other lab tests.

Many health care providers plan x-rays or other imaging tests before treatment starts. These pictures are then used to track changes during treatment. These are called baseline studies because they show how things looked at the start. They can be compared with later images to see the results of treatment over time.

Imaging tests aren't perfect

Imaging test can often be very helpful, but they have limits. For instance, most of the time, these tests alone can't show for sure if a change is caused by cancer.

Imaging tests can find large groups of cancer cells, but no imaging test can show a single cancer cell or even a few. In fact, it takes millions of cells to make a tumor big enough to show up on an imaging test. This is why treatment may continue even when cancer cells can no longer be seen on an imaging test. The goal is to get any surviving cancer cells. Even one can grow and, over time, become a tumor that will again be big enough to cause problems and/or show up on an imaging test.

On the other hand, sometimes imaging tests can show something that looks like cancer, but further tests (such as a biopsy) show that it's not cancer.

Who does imaging tests and who interprets them?

A doctor, a certified technologist, or other health professional may do an imaging test. The test may be done in a hospital, a special clinic or imaging center, or a doctor's office. In larger medical centers, imaging tests are often done in the radiology or nuclear medicine department.

A radiologist is a doctor who specializes in imaging techniques. He or she is the person who usually reads (interprets) the images made during the test. The radiologist writes a report on the findings and sends the report to your doctor. A copy of the report will become part of your patient records. Your other doctors (oncologists, surgeons, etc.) may look at the images, too.

Types of imaging tests

Many different kinds of scans are used to get images of what's happening inside the body. Some of the more common types of imaging tests, how they are done, and when you might need them can be found in these sections:

- [Computed tomography \(CT\) scan](#)⁴
- [Magnetic resonance imaging \(MRI\) scan](#)⁵
- [Breast MRI](#)⁶
- [X-rays and other radiographic tests](#)⁷
- [Mammography](#)⁸
- [Nuclear medicine scans \(bone scans, PET scans, Thyroid scans, MUGA scans, gallium scans\)](#)⁹
- [Ultrasound](#)¹⁰

The tests your health care provider recommends may depend on a number of factors, such as:

- Where the tumor is and what type it is. Some imaging tests work better for certain parts of the body
- Whether or not a biopsy (tissue sample) is needed
- Your age, gender, and overall health
- The balance between any risks or side effects and the expected benefits
- Your preference
- Cost

If you have questions about a test that your health care team wants you to have, ask them. You may want them to explain why you need the test, what it could find, the pros and cons of having the test, and if there are any other options to the test. Also be sure to ask about cost. Will your insurance cover the test? Do you need to OK it with your insurance before getting the test? (This is called pre-certification.)

Hyperlinks

1. www.cancer.org/healthy/find-cancer-early.html
2. www.cancer.org/treatment/understanding-your-diagnosis/tests/testing-biopsy-and-cytology-specimens-for-cancer.html
3. www.cancer.org/treatment/understanding-your-diagnosis/staging.html
4. www.cancer.org/treatment/understanding-your-diagnosis/tests/ct-scan-for-cancer.html
5. www.cancer.org/treatment/understanding-your-diagnosis/tests/mri-for-cancer.html
6. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/breast-mri-scans.html
7. www.cancer.org/treatment/understanding-your-diagnosis/tests/x-rays-and-other-radiographic-tests.html
8. www.cancer.org/cancer/breast-cancer/screening-tests-and-early-detection/mammograms.html
9. www.cancer.org/treatment/understanding-your-diagnosis/tests/nuclear-medicine-scans-for-cancer.html
10. www.cancer.org/treatment/understanding-your-diagnosis/tests/ultrasound-for-cancer.html

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Hricak H, Akin O, Bradbury MS, et al. Advanced imaging methods: Functional and metabolic imaging. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles & Practice of Oncology*. 7th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2005:589-720.

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