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How Is a Biopsy Done?

A **biopsy** is a procedure used to take out a sample (sometimes called a specimen) of a lump, tumor, or other suspicious area to be tested in a lab.

- [Needle biopsy](#)
- [Endoscopic biopsy](#)
- [Surgical \(open\) biopsy](#)
- [Skin biopsies](#)
- [Sentinel lymph node mapping and biopsy](#)
- [Liquid biopsy](#)

Biopsy samples of cells or body tissues can be taken from almost any part of the body and used to help diagnose cancer. In fact, cancer is almost always diagnosed through a biopsy. How the samples are removed depends on where the abnormal area is, what type of cancer is suspected, and why the biopsy is being done. For instance, the methods used for skin biopsies are different from those used for brain biopsies.

In some cases, the best type of biopsy might require some type of surgery to remove part or all of an abnormal area, or even an entire organ. These biopsies are usually done by a surgeon. For other types of biopsies, small tumor samples are removed using a hollow needle or through an [endoscope](#)¹ (a flexible lighted tube that's put into the body). These biopsies might be done by surgeons as well, but they can also be done by other types of doctors.

The most common biopsy types used to look for cancer are discussed here. For more details, go to the testing information on the [specific type of cancer](#)² you want to learn about.

Needle biopsy

In a needle biopsy, a hollow needle is used to remove small biopsy samples. There are 2 main types of needle biopsies:

- Fine needle biopsy (also called fine needle aspiration, or FNA)
- Core needle biopsy (CNB)

Fine needle aspiration

Fine needle aspiration (FNA) uses a very thin, hollow needle attached to a syringe to withdraw (aspirate) a small amount of fluid and very small pieces of tissue from the tumor.

If the tumor is near the surface of the body, the doctor can aim the needle while feeling the lump. If the tumor is deeper inside the body, the needle can be guided into place using an imaging test such as an ultrasound or CT scan.

FNA biopsies usually don't cause too much discomfort, but if the tumor is in a sensitive area, the doctor may inject local anesthesia (numbing medicine) under the skin near the tumor before the biopsy is done.

The main advantages of FNA are that the skin doesn't have to be cut, and in some cases it's possible to make a diagnosis the same day. The main disadvantage is that sometimes the thin needle can't remove enough tissue to make a definite diagnosis (or to do other lab tests that might be needed).

Although FNA is a type of biopsy, it can also be considered a type of [cytology test](#)³.

Core needle biopsy

Needles used in a core biopsy are slightly larger than those used in FNA. They remove a small cylinder ("core") of tissue.

A core needle biopsy (CNB) is most often done using local anesthesia (numbing medicine) in a doctor's office or clinic. Like FNA, a core biopsy can be used to sample tumors that the doctor can feel, as well as some that can only be seen using imaging tests.

Doctors sometimes use special vacuum tools to get larger core biopsies from breast tissue. (For more on this, see our [breast biopsy](#)⁴ information.)

An advantage of this type of biopsy is that it removes more tissue than an FNA, still without needing surgery.

Processing core biopsy samples usually takes longer than with FNA biopsies, so getting the results of these tests also might take longer.

Endoscopic biopsy

An endoscopic biopsy is done with a procedure known as an **endoscopy**.

During an endoscopy, a doctor uses an **endoscope** (a thin, flexible, tube that has a small light and either a lens or a tiny video camera on the end) that can be passed inside the body to look at a specific area.

Different types of endoscopes can be used to look at different parts of the body. For example, one type of endoscope can be used to look inside the nose, sinuses, and throat. Another type of endoscope can be used to look at the esophagus (the tube that connects the throat to the stomach), stomach, and first part of the intestine.

For an endoscopic biopsy, the doctor passes long, thin instruments down the endoscope to remove tissue or fluid samples for testing.

Depending on the type of endoscopy procedure, different types of anesthesia might be used.

To learn more about some of the more common types of endoscopy procedures, see [Endoscopy](#)⁵.

Laparoscopic, thoracoscopic, and mediastinoscopic biopsy

These procedures also use different types of scopes to look inside the body, but unlike the endoscopic biopsies described above, they require a small cut to be made in the skin to insert the scope. During these procedures, long, thin instruments can be passed through other small cuts to remove biopsy samples for testing.

- [Laparoscopy](#)⁶ is used to look inside the abdomen (belly).
- [Thoracoscopy](#)⁷ is used to look inside the chest.
- [Mediastinoscopy](#)⁸ is used to look at the space between the lungs.

These types of procedures are most often done in an operating room. Depending on the

procedure, different types of anesthesia might be used.

Surgical (open) biopsy

For these types of biopsies, some type of surgery is done to remove samples for testing.

Excisional or incisional biopsy

For these biopsies, a surgeon cuts through the skin to remove either the entire tumor (called an **excisional biopsy**) or a small part of a large tumor (called an **incisional biopsy**).

This is often done using local or regional anesthesia (medicines that numb the area). For tumors that are deeper in the body (such as inside the chest or abdomen), you will probably need general anesthesia (where you are put into a deep sleep so you won't feel pain).

Laparotomy and thoracotomy

A **laparotomy** is a type of surgery in which the doctor cuts into the abdomen (belly), usually with a vertical cut from upper to lower abdomen. A **thoracotomy** is a similar procedure in which a long cut is made to look inside the chest.

These types of procedures aren't usually needed if a biopsy is all that's being done. But they might be done when a suspicious area can't be diagnosed with less invasive tests (like a needle biopsy or laparoscopy/thoracoscopy), or if the surgeon plans on doing other things as well (such as removing most or all of an organ).

During these procedures, biopsy samples can be taken from a suspicious area. The doctor can also look at the size of the area and its location, as well as check nearby tissues.

This type of procedure typically requires general anesthesia (where you are in a deep sleep so you feel no pain).

Skin biopsies

There are many ways to biopsy abnormal areas on the skin. Your doctor will choose the one best suited to the type of skin tumor suspected.

Shave biopsies remove the upper layers of skin. They are most often used for suspected basal cell or squamous cell skin cancers, but they are used less often for suspected melanomas of the skin.

Punch biopsies or **excisional biopsies** (as discussed previously) remove deeper layers of the skin as well, so they can be used to find out how deeply a melanoma has gone into the skin – an important factor in choosing treatment for that type of cancer.

For more on these types of biopsies, see [Skin Biopsy and Treatment Procedures](#)⁹.

Sentinel lymph node mapping and biopsy

Sentinel lymph node mapping and biopsy, often referred to as just a **sentinel lymph node biopsy (SLNB)**, is a way to find out if a cancer (especially melanoma or breast cancer) has spread to nearby lymph nodes. This can help determine the stage (extent) of the cancer, as well as a person's treatment options.

This procedure can find the lymph nodes that drain lymph fluid from the area where the cancer started. If the cancer has spread, these **sentinel lymph nodes** are usually the first place it will go.

To find the sentinel lymph node (or nodes), the doctor injects a small amount of slightly radioactive (or iron-containing) material into the area of the cancer, sometimes along with a colored dye. A short time later, the doctor checks the nearby lymph node areas with a machine that detects radioactivity (or that uses a magnet to detect iron particles) to find the lymph nodes the cancer is most likely to travel to. Then the doctor makes a small cut in the skin to see the lymph nodes in that area. The first one to have turned color (or to be detected with the machine) is the sentinel node.

The doctor will then remove the sentinel node (or nodes) to be looked at under a microscope. If no cancer cells are found, no more lymph nodes need to be taken out because it's very unlikely the cancer would have spread beyond this point. If cancer cells are found in the sentinel node, the rest of the lymph nodes in this area are usually removed and looked at, too. This is called a **lymph node dissection**.

Liquid biopsy

Biopsies that sample body tissues – whether they're done with a needle, an endoscope, or some type of surgery – are often an important part of a person's cancer care. For example, they can be used to diagnose cancer, to help determine how far it has spread, to see if the cancer cells have certain gene or protein changes that might affect a

person's treatment options, and to see if the cancer has come back.

But tissue biopsies can have drawbacks. For example, they sometimes require surgery (and anesthesia). And tissue biopsies might be hard to do if a tumor is in a place that's hard to reach, if it's in a bone (which can be hard to biopsy), or if a person has other serious health issues that would make it hard for them to have a biopsy.

For a **liquid biopsy**, a sample of blood (or another body fluid, such as the pleural fluid in the chest) is removed and tested for cancer. Some cancers shed tumor cells or parts of cells into the blood, which can then be detected with special lab tests. Depending on the test, it might look for:

- Cancer cells (sometimes called **circulating tumor cells**, or **CTCs**)
- Genetic material from the cells, such as DNA (sometimes called **circulating tumor DNA (ctDNA)** or **cell-free DNA (cfDNA)**) or RNA
- Proteins from the cancer cells

Not all cancers shed cells (or parts of cells) into the blood, so these tests can't always be used. But when a liquid biopsy can be done, it can often provide some of the same important information that a tissue biopsy can, with just a blood draw instead of a more invasive procedure. Some ways in which liquid biopsies might be helpful include:

- Helping to [find cancer early](#)¹⁰
- Looking for certain gene or protein changes in the cancer cells, which might help determine the best treatment options. (This is an example of [personalized or precision medicine](#)¹¹.)
- Determining how well treatment is working (or if further treatment might be needed)
- Looking for changes in the cancer cells over time, which may help determine if treatment needs to be changed
- Looking for signs that cancer has come back

Doctors are still learning the best ways to use liquid biopsies. But these tests are becoming a more important part of the treatment for some types of cancer.

Hyperlinks

1. www.cancer.org/cancer/diagnosis-staging/tests/endoscopy.html

3. www.cancer.org/cancer/diagnosis-staging/tests/biopsy-and-cytology-tests/cytology-types.html
4. www.cancer.org/cancer/types/breast-cancer/screening-tests-and-early-detection/breast-biopsy/core-needle-biopsy-of-the-breast.html
5. www.cancer.org/cancer/diagnosis-staging/tests/endoscopy.html
6. www.cancer.org/cancer/diagnosis-staging/tests/endoscopy/laparoscopy.html
7. www.cancer.org/cancer/diagnosis-staging/tests/endoscopy/thoracoscopy.html
8. www.cancer.org/cancer/diagnosis-staging/tests/endoscopy/mediastinoscopy.html
9. www.cancer.org/cancer/types/skin-cancer/skin-biopsy-treatment-procedures.html
10. www.cancer.org/cancer/screening/multi-cancer-early-detection-tests.html
11. www.cancer.org/cancer/managing-cancer/treatment-types/precision-medicine.html

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