

Biopsy

Introduction

A biopsy is a medical procedure that involves taking a small sample of tissue so that it can be examined under a microscope.

A tissue sample can be taken from almost anywhere on, or in, your body, including the skin, stomach, kidneys, liver and lungs.

The term biopsy is often used to refer to both the act of taking the sample and the tissue sample itself.

What is a biopsy used for?

Biopsies can be used to investigate the cause of a person's symptoms or to help diagnose a number of different health conditions. They are also often used to identify abnormal cells and to help identify a specific type of condition.

Where a condition has already been diagnosed, a biopsy can be used to measure how severe it is or what stage it is at. For example, the results of a biopsy can show how severely an organ, such as the liver, is inflamed.

Biopsies can often help diagnose or rule out:

cancer

peptic ulcers – ulcers affecting the digestive system

hepatitis – inflammation of the liver

kidney disease

endometriosis – where cells that usually line the womb are found elsewhere in the body

It is impossible to tell whether a lump or growth on your skin or inside your body is cancerous (malignant) or non-cancerous (benign) just by looking at it or feeling it. A biopsy can provide this information.

Types of biopsy

There are various types of biopsy that can be used to help identify a wide range of health conditions. Types of biopsy include:

scraping cells – removing cells from the surface layer of tissue, such as from the inside of the mouth or from inside the cervix (neck of the womb), as part of a cervical screening test

a punch biopsy – is for diagnosing skin conditions using a special instrument to punch a small hole in the skin to obtain a skin sample

a needle biopsy – a special hollow needle, guided by ultrasound, is used to obtain tissue from an organ or from tissue beneath the skin

an endoscopic biopsy – where an endoscope is used to remove tissue, such as from the stomach during a gastroscopy (a diagnostic procedure of the stomach or upper gastrointestinal tract)

an excisional biopsy – where surgery is used to remove a larger section of tissue

perioperative biopsy – if consent has been given, a perioperative biopsy can be carried out during surgery; the sample will be tested straight away so that the surgeon can be given the diagnosis and provide appropriate treatment

How a biopsy is carried out will depend on where the tissue sample is being taken from. CT scanning is often used to guide some types of biopsy.

After the tissue sample has been removed, it will be examined under a microscope to see whether it's abnormal. If it is, the aim is to identify the nature of the problem. This often means that a definite diagnosis is made.

The tissue may be tested using various chemicals to see how it responds and to find out what it contains. The type of tests used will depend on the medical conditions being investigated.

Recovery

Most biopsies will only require local anaesthetic, which means that you won't need to stay in hospital overnight. However, a general anaesthetic may be needed for surgery, in which case you may have to stay in hospital overnight.

Most types of biopsy are painless, although this depends on where from your body the sample is taken. You may experience a dull ache which can be treated with painkillers on the advice of your doctor or surgeon.

Some types of biopsy may involve staying in hospital for a few hours. You may need to have stitches or a dressing applied before you leave.

Getting your results

How quickly you get the results of a biopsy will depend on the urgency of your case and the hospital where you had the procedure.

If a serious condition is suspected, your results may be available within a few days. However, this is difficult to predict because further tests may be needed after the first examination of the sample. Sometimes it is also necessary to send microscope slides away to get a specialist's opinion. A cervical smear test result usually takes 10-14 days.

A different processing method is used when a biopsy is carried out during surgery. This means the result is often available within minutes, which enables the appropriate treatment to be given while the surgery is in progress.

Your DOCTOR, hospital consultant or practice nurse will give you your results and explain what they mean. Sometimes, a biopsy will be inconclusive, meaning it hasn't produced a definitive result. If this is the

case, the biopsy may need to be repeated or other tests may be needed to double-check your diagnosis.

What happens during a biopsy

There are many ways of getting a tissue sample, depending on the type of tissue being collected and where in the body it's being taken from.

CT scanning is often used to guide some types of biopsy.

Scraping cells

In some cases, scraping cells from the surface layer of tissue, such as inside the mouth, is enough to provide a suitable sample for examination. This type of 'scraping biopsy' can be slightly uncomfortable but is not painful, so anaesthetic isn't required.

A cervical screening test is a procedure during which a small brush-like instrument is used to gently remove a sample of cells from the neck of the womb (cervix). The cells are then examined under a microscope for any abnormal changes (dysplasia).

If there are abnormal cell changes, the cells may be cancerous, or there may be an increased risk that they will become cancerous.

Punch biopsy

A punch biopsy can often be used to investigate skin conditions, such as deep spots and sores.

During a punch biopsy, a special surgical instrument is used to make a small hole in your skin and remove samples of the top layers of tissue. If you have a punch biopsy, you will usually be given a local anaesthetic to numb the area.

Alternatively, a scalpel (a sharp medical knife) may be used to remove a small amount of surface skin. The wound will be closed using stitches.

Needle biopsy

A fine-needle aspiration (FNA) biopsy is often used to take tissue samples from organs or from lumps that are below the surface of the skin. If a larger sample is needed, a core needle biopsy (CNB) may be used instead.

To obtain the sample, a special, hollow needle is inserted through your skin and into the area being examined. Ultrasound or X-rays will be used to help guide the needle to exactly the right place.

When the needle is in position, it will 'suck out' a sample of tissue. If you have a needle biopsy, a local anaesthetic will usually be used to numb the area so that you won't experience any pain or discomfort.

Breast lumps

In most cases, a needle biopsy can be used to get more information about a breast lump. The needle is inserted into the lump and a sample of tissue will be taken for testing.

A core needle biopsy (CNB) is often used to gain a larger sample of tissue. In some cases, a fine needle aspiration (FNA) biopsy may be used to drain a cyst.

Organs

A thicker, hollow needle is used for taking organ biopsies, such as the liver or kidneys. You will be asked to breathe in and hold your breath while the needle is inserted into your abdomen.

It takes a few seconds for a small tissue sample to be taken. A local anaesthetic is usually used for this type of biopsy because you need to be awake to breathe in.

Bone marrow

A thick needle is also used to take samples of bone marrow (the soft, jelly-like tissue found in the hollow centre of large bones).

Bone marrow biopsies can be carried out for a number of different reasons, including to find out why you have:

a low or high number of red blood cells (anaemia)

a low or high number of white blood cells (leucopenia)

a low or high number of platelets (blood-clotting cells)

A number of different health conditions may be responsible for these types of blood abnormalities, such as leukaemia (cancer of the bone marrow and white blood cells).

Samples of bone marrow are also sometimes taken to check how well treatment for leukaemia is working, or to determine how far certain types of cancer have progressed (what stage it's at).

Bone marrow biopsies are usually taken from the top of the pelvis bone, just below your waist. You will usually have a local anaesthetic to numb the area, and you may also be given a sedative (medication) to help you relax and cope with any discomfort, nerves or anxiety.

Endoscopic biopsy

An endoscope is a medical instrument that's used to look inside your body. It's a thin, flexible tube with a light and a camera at one end. Tiny cutting tools can also be attached to the end of an endoscope to allow the surgeon to take a tissue sample.

An endoscope can be inserted through your throat, back passage (anus), or through small cuts made by the surgeon.

Depending on the area of the body being investigated and the entry point of the endoscope, either local or general anaesthetic will be used.

Excisional biopsy

An excisional biopsy is used to remove a larger area of tissue, such as a lump, for closer examination.

Depending on where in the body the lump is located, an excisional biopsy may be carried out under either a local or a general anaesthetic.

Perioperative biopsy

A biopsy is sometimes carried out during an operation for another, unrelated reason. A tissue sample is taken during surgery and is checked immediately so that the surgeon gets the results quickly and can decide how to progress with treatment.

A lump found during surgery may be removed completely if the patient is still under anaesthetic and has previously given their consent (approval).

Testing a tissue sample

After a tissue sample has been taken, it will be sent to a laboratory so that it can be examined under a microscope and the tissue's cells can be tested.

Closely examining the cells in the tissue sample enables scientists to determine whether they are normal or abnormal. For example, cancerous cells look and behave differently to normal cells.

As well as looking at the tissue sample, chemical or genetic tests can also be carried out. For example, a chemical test is sometimes used to help diagnose cystic fibrosis (where the lungs and digestive system become clogged with thick sticky mucus). A chemical reaction will occur if the gene for cystic fibrosis is present in the tissue cells.

Tests for cystic fibrosis and other genetic conditions can even be carried out on a cell sample taken from an unborn baby. The sample is taken from the placenta using a pre-natal biopsy known as chorionic villus sampling (CVS).

Recovering from a biopsy

Biopsies are usually straightforward procedures that are carried out using local anaesthetic.

They are often outpatient procedures, meaning you will not need to stay in hospital overnight.

However, some types of biopsy, such as those that involve taking a tissue sample from an internal organ, will require a general anaesthetic. In this case, you may need to stay in hospital overnight.

After having a biopsy, you will not usually feel any pain. However, if you've had a tissue sample taken from a major organ, such as your liver or bone marrow, you may feel a dull ache or some slight discomfort. Your doctor or surgeon will be able to advise you about the painkillers you can take to help relieve this.

If an incision is needed to remove a tissue sample – for example, during an endoscopic biopsy or an excisional biopsy – stitches may be required to close the wound, or a dressing may need to be applied.

If tissue is removed from an internal organ, such as your liver or kidneys, you will need to stay in hospital for a few hours after the procedure.

This is so that you can rest and hospital staff can ensure there is no internal bleeding. It is rare for serious bleeding to occur following a biopsy, but if it does, you may need to have an operation or a blood transfusion.

Women who have had samples taken from their reproductive system, such as the lining of the cervix (neck of the womb), may experience some light, temporary vaginal bleeding. Painkillers can be used to help treat any cramping you experience.

Men who have had a prostate biopsy may temporarily have blood in their urine.