PROCEDURE

# Needle aspiration biopsy

A needle aspiration biopsy removes cells or fluid through a thin needle for laboratory examination.

**PURPOSE**
Sample cells or fluid for laboratory examination

**PROCEDURE TYPE**
Diagnostic, sometimes therapeutic; minimally invasive needle procedure

**WHERE IT IS DONE**
Outpatient clinic, interventional radiology suite, or bedside

**ANAESTHESIA**
None or local; sedation for selected deep targets

**HOW LONG IT TAKES**
Usually 10 to 30 minutes

**PREPARATION**
Often none; fasting or medicine changes for some targets

**RECOVERY**
Same day; no driving after sedation

**MAIN RISKS**
Bleeding, infection, pain, nearby organ injury

**RESULTS**
Usually several days after laboratory examination

## Overview

A needle aspiration biopsy uses a thin, hollow needle to remove cells or fluid from a lump, organ, or other area. It is often called fine-needle aspiration when a very thin needle is used.

The sample is sent to a laboratory. A specialist examines the cells under a microscope to look for infection, inflammation, cancer, or other changes. The procedure can help investigate an abnormal area, but the result must be considered alongside your examination, scans, and other tests.

Needle aspiration may also drain fluid from a cyst or collection. In that situation, it can relieve pressure as well as provide a sample.

This procedure is different from a core needle biopsy. A core biopsy uses a wider needle to

remove small pieces of tissue rather than mainly loose cells or fluid.

## Why the procedure is performed

You may be offered a needle aspiration biopsy to investigate:

The biopsy may help determine whether an area is non-cancerous, cancerous, infected, or inconclusive. It can also provide cells for additional laboratory tests.

A needle aspiration biopsy is often chosen because it requires only a small skin puncture and usually allows a quick return to normal activities.

- A lump or swelling that can be felt through the skin
- A thyroid or breast nodule
- An enlarged lymph node
- An abnormal area seen on an ultrasound, CT, or other scan
- A cyst or fluid collection
- A suspected infection or inflammatory condition
- A previously diagnosed condition that needs further testing

## Who should and should not have it

The procedure may be suitable when the target can be reached safely and a sample of cells or fluid is likely to answer the clinical question. It may be especially useful for lumps close to the skin or targets that can be seen clearly with imaging.

It is not the right test for every abnormal area. A core or surgical biopsy may be preferred when the laboratory needs a larger piece of tissue to see how cells are arranged.

The procedure may be delayed or avoided if:

Taking a blood thinner like warfarin or apixaban does not automatically rule out a biopsy. The decision depends on the medicine, the target, and your bleeding risk. Do not stop a prescribed medicine unless your healthcare team gives you specific instructions.

- There is no safe route to the target
- You have an untreated bleeding problem
- Medicines increase bleeding risk and cannot be adjusted safely

- There is an infection in the skin where the needle would enter
- You cannot remain still enough for the procedure to be performed safely
- Earlier samples were inadequate and another biopsy method is more suitable

## How to prepare

Your treating facility's own instructions take priority because preparation differs according to the biopsy site and whether sedation is planned.

Many superficial biopsies need little preparation. For a deeper biopsy or one performed with sedation, you may be asked not to eat or drink for several hours.

Tell the team about:

Wear comfortable clothing and leave jewellery away from the biopsy area at home. Arrange for an adult to take you home if you will receive sedation.

- Blood thinners, aspirin, and other medicines or supplements
- Allergies, including reactions to local anaesthetic or dressings
- Bleeding conditions or previous unusual bleeding
- Pregnancy or possible pregnancy, particularly if CT guidance is planned
- Diabetes, especially if you have been told to fast
- Previous problems with sedation

## What happens during the procedure

You may have an ultrasound or CT scan to locate the target. Lumps close to the skin can sometimes be sampled by touch without imaging.

You will be positioned so the clinician can reach the area safely. The skin is cleaned. Local anaesthetic may be injected to numb the area, although it is not always needed for a very fine needle.

The clinician inserts the needle into the target. A syringe may be used to draw cells or fluid into the needle. The needle may move gently within the area to collect enough material. You might feel pressure, pulling, or brief discomfort.

Several passes may be needed. Each pass uses a sterile needle. In some facilities, a laboratory specialist checks the sample during the procedure to see whether it contains enough cells.

After the needle is removed, pressure is applied to reduce bleeding. The area is usually covered with a small dressing. Stitches are not normally needed.

## Recovery and what to expect afterward

Pain: Mild soreness, tenderness, or bruising can occur around the needle site. A wrapped cold pack may help. Use only the pain medicine recommended by your healthcare team, particularly if bleeding is a concern.

Eating: You can usually eat and drink normally afterward. If you received sedation, follow the facility's instructions about restarting food and fluids.

Activity: Keep the dressing clean and dry for the period you were given. Light activity is usually possible the same day. You may need to avoid strenuous exercise or heavy lifting for a short time, especially after a biopsy of a deep organ.

Driving: You may be able to drive after a simple biopsy without sedation if you feel well and the biopsy site does not affect safe movement. Do not drive after sedation. Arrange transport and follow the facility's stated restriction.

Work: Many people return to desk work the same day or the following day. A longer break may be appropriate if your work is physical, you received sedation, or the biopsy involved a deep organ.

## Risks and possible complications

Temporary pain and bruising are the most common concerns. A small amount of bleeding at the puncture site may also occur.

Other possible complications include:

Some risks are specific to the biopsy site. For example, a lung biopsy can allow air to collect around the lung, while a neck biopsy can cause swelling near the airway. Your team should explain the risks that apply to your planned biopsy.

A needle aspiration biopsy cannot always collect enough cells. Even an adequate sample examines only the area reached by the needle. Further testing may therefore be recommended if the result is unclear or does not fit the scan findings.

- Bleeding beneath the skin or inside the sampled area
- Infection

- Injury to a nearby nerve, blood vessel, or organ
- An inadequate sample that cannot provide a clear result
- A result that does not match the final diagnosis

## Results and follow up

Fluid drainage may provide immediate information about whether the area was cyst-like or solid. A final laboratory result usually takes several days. Additional stains or molecular tests can take longer.

Results may be described as benign, meaning no cancer was identified; malignant, meaning cancer cells were identified; suspicious or indeterminate; or non-diagnostic, meaning there were not enough useful cells.

A benign result may lead to routine monitoring if the lump or scan still needs observation. An indeterminate or non-diagnostic result may lead to another aspiration, a core needle biopsy, surgery, or follow-up imaging.

Ask how and when you will receive the result. Contact the healthcare team routinely if the expected reporting date passes and you have not heard from them.

## Alternatives

The realistic alternatives depend on what is being investigated.

Blood tests and scans can provide useful information, but they often cannot replace examination of cells or tissue.

- Imaging follow-up: Avoids an immediate procedure but does not provide cells for diagnosis and may delay a definite answer
- Core needle biopsy: Provides larger tissue samples and more structural detail but uses a wider needle and may cause more bleeding or soreness
- Surgical biopsy: Removes part or all of an abnormal area and provides the largest sample, but requires a more invasive procedure and longer recovery
- Endoscopic biopsy: Reaches targets inside the digestive or breathing passages but may require sedation and carries procedure-specific risks
- No immediate testing: Avoids biopsy risks but leaves uncertainty and may not be appropriate when the finding needs timely assessment

## When to call your healthcare team

For routine advice, contact the team if soreness or bruising is not gradually improving, the lump refills after drainage, or you have questions about dressings, activity, or delayed results.

Seek urgent medical advice for:

Call emergency services for severe breathing difficulty, fainting, uncontrolled bleeding, rapidly increasing neck swelling, or chest pain and shortness of breath after a chest or lung biopsy.

- Bleeding that continues despite firm pressure
- Increasing redness, warmth, swelling, or drainage
- Fever or worsening pain
- New numbness or weakness near the biopsy area

## Common questions

Will I be asleep?

Usually not. Most needle aspiration biopsies are performed while you are awake, with either no anaesthetic or local anaesthetic. Sedation may be used for a difficult-to-reach target or when remaining still would be hard.

Can I drive home?

You may be allowed to drive after a straightforward biopsy without sedation. You cannot drive after sedation, and some biopsy sites can temporarily limit safe movement. Follow the facility's instructions.

How painful is it?

You may feel a brief sting from local anaesthetic and pressure or pinching as the sample is taken. Mild soreness can continue afterward. Tell the team during the procedure if you have significant pain.

When will I know the result?

Initial observations may be available immediately, but the final laboratory report usually takes several days. Extra testing can extend that time.

What if the sample is not enough?

The laboratory may report the biopsy as non-diagnostic. Your team may recommend repeating the aspiration, performing a core needle biopsy, arranging surgery, or monitoring the area with imaging.

Is it the same as a core needle biopsy?

No. Needle aspiration mainly collects individual cells or fluid through a thin needle. A core biopsy removes small cylinders of tissue and can provide more detail about tissue structure.

## Sources

- National Cancer Institute: Definition of fine-needle aspiration biopsy
- RadiologyInfo.org, American College of Radiology and Radiological Society of North America: Biopsy overview
- NHS: Biopsy
- Mayo Clinic: Needle biopsy
- American Cancer Society: Biopsy and cytology tests