PROCEDURE

# Synovial biopsy

A synovial biopsy removes small samples of joint lining for laboratory examination

**PURPOSE**
Identify inflammation, infection, deposits, or abnormal tissue

**PROCEDURE TYPE**
Diagnostic; minimally invasive needle or surgical arthroscopic sampling

**WHERE IT IS DONE**
Outpatient clinic or operating theatre

**ANAESTHESIA**
Local; sedation or general anaesthesia for arthroscopy

**HOW LONG IT TAKES**
About 30-90 minutes, based on technique and joint

**PREPARATION**
Medication review; fasting when sedation or general anaesthesia planned

**RECOVERY**
Same day; no driving after sedation or general anaesthesia

**MAIN RISKS**
Bleeding, infection, tissue injury, non-diagnostic sample

**RESULTS**
Several days; specialized cultures may take weeks

## Overview

A synovial biopsy removes small pieces of the tissue lining a joint. This lining is called the synovium. It produces fluid that helps the joint move smoothly.

The samples are examined under a microscope and may be tested for bacteria, fungi, crystals, or other substances. A biopsy can provide information that joint fluid tests, blood tests, and scans cannot provide.

Most biopsies are taken through a needle guided by ultrasound or during arthroscopy. Arthroscopy uses a thin camera and small instruments inserted through small cuts near the joint. Open surgery is rarely needed solely to obtain a synovial sample.

A synovial biopsy is mainly a diagnostic procedure. If it is performed during arthroscopy, other treatment may sometimes be done at the same time, such as washing out the joint or

removing damaged tissue.

## Why the procedure is performed

Your healthcare team may suggest a synovial biopsy when the reason for ongoing joint inflammation remains uncertain after other tests.

It may help investigate:

The biopsy may also be performed during planned arthroscopy for another joint problem. It is not usually the first test for ordinary joint pain or short-lived swelling.

- Persistent swelling or inflammation in one or more joints
- A possible joint infection when fluid cultures have not found a cause
- Unusual infections, including fungal or mycobacterial infections
- Crystal or other material deposited in the joint lining
- A possible benign or cancerous growth involving the synovium
- Inflammation that does not fit a clear pattern on blood tests or imaging

## Who should and should not have it

A synovial biopsy may be appropriate if knowing what is happening in the joint lining could change your treatment. It is most useful when less invasive tests have not provided a clear answer or when tissue is needed to confirm a suspected infection or abnormal growth.

The procedure may be avoided or delayed if you have an infection in the skin over the proposed entry site. Passing a needle or instrument through infected skin could carry germs into the joint.

A significant bleeding problem may also require treatment first. Blood thinners and medicines that affect platelets can increase bleeding risk, but they do not always need to be stopped. Stopping them without a medical plan can be dangerous.

Arthroscopic biopsy may not be suitable if the risks of anaesthesia or surgery are too high because of another illness. Pregnancy, allergies, a joint replacement, or previous surgery do not automatically rule out biopsy, but they may affect how and where it is performed.

When a rapidly developing joint infection is suspected, urgent joint-fluid removal and treatment may be needed. A biopsy should not cause an unsafe delay.

## How to prepare

Your treating facility's own instructions take priority because preparation differs between needle and arthroscopic biopsy.

Give the team an up-to-date list of medicines, vitamins, supplements, and non-prescription products. Tell them about blood thinners like warfarin or apixaban , bleeding conditions, medicine or adhesive allergies, diabetes, pregnancy, implanted devices, and previous reactions to anaesthesia.

You may be asked to:

Do not stop a blood thinner unless the clinician responsible for the procedure and, when needed, the prescriber have given you a clear plan.

If only local anaesthetic is planned, fasting may not be necessary. Confirm this with the facility rather than assuming you can eat or must fast.

- Adjust certain medicines under specific medical instructions
- Avoid food and drink before sedation or general anaesthesia
- Arrange for an adult to take you home
- Wear loose clothing that fits over a dressing
- Leave jewellery and valuables at home

## What happens during the procedure

The team confirms the joint, cleans the skin, and covers the area with sterile drapes. Monitoring equipment may be attached if you are receiving sedation or general anaesthesia.

For an ultrasound-guided biopsy, local anaesthetic numbs the skin and deeper tissue. The clinician uses live ultrasound images to guide a hollow needle into the synovium. Several small samples are usually taken from different areas. You may feel pressure or brief pulling, but sharp pain should be reported.

For an arthroscopic biopsy, the surgeon makes small cuts near the joint. A camera is inserted so the synovium can be viewed directly, and small instruments remove tissue samples. You may receive general anaesthesia, sedation with local anaesthetic, or a regional anaesthetic that numbs a larger part of the body.

Joint fluid may also be removed. The tissue and fluid can be sent separately for microscopic examination, culture, or specialized testing. The cuts are then covered with a dressing;

arthroscopy cuts may need stitches.

## Recovery and what to expect afterward

Some soreness, bruising, or swelling is expected around the biopsy area. Arthroscopy generally causes more discomfort than a needle biopsy. Use only the pain relief recommended for you, and follow instructions about ice, dressings, and raising the joint.

You can usually eat and drink normally once you are fully awake. After anaesthesia, start as directed by the recovery team, especially if you feel nauseated.

Activity limits are based on the joint and biopsy method. You may need to rest the joint for a short period and avoid strenuous exercise, heavy lifting, or soaking the wound. Crutches or another support may be advised after a biopsy of a weight-bearing joint.

Do not drive home after sedation or general anaesthesia. Follow the facility's instructions about when driving is safe again. You must be able to control the vehicle comfortably and perform an emergency stop.

Return to work is often possible within a day or two after a needle biopsy. Arthroscopy or physically demanding work may require more time. Your procedure team should provide restrictions suited to your job and the joint involved.

## Risks and possible complications

A synovial biopsy can cause temporary pain, bruising, stiffness, or swelling. Bleeding into the joint, called a haemarthrosis, is possible. The risk may be higher if you have a bleeding disorder or take medicines that affect clotting.

Infection can occur at the skin opening or inside the joint. Sterile technique is used to reduce this risk.

A needle or surgical instrument can injure nearby cartilage, tendons, nerves, or blood vessels. Arthroscopy also carries risks related to anaesthesia and small surgical wounds.

Sometimes the sample is too small, comes from an unaffected area, or does not show a clear cause. Further testing or another biopsy may then be considered. A negative result cannot always rule out infection or another condition because synovial changes may be unevenly distributed.

## Results and follow up

A pathologist examines the tissue under a microscope. The report may describe inflammation, infection, crystal deposits, abnormal cell growth, or other changes.

Routine laboratory processing often takes several days. Bacterial cultures can take longer, and tests for fungi or mycobacteria may take weeks. Timing also reflects whether special stains, molecular tests, or a second pathology opinion are needed.

Your healthcare team should explain how you will receive the results and who will discuss them with you. Results are interpreted alongside your joint-fluid findings, blood tests, scans, and medical history. The biopsy does not always provide a diagnosis by itself.

Routine follow-up also checks that the wound is healing and reviews whether treatment or further testing is needed.

## Alternatives

The alternatives depend on what the team is trying to find.

Joint aspiration removes fluid through a needle. It is simpler and can detect common infections or crystals, but it does not provide a sample of the joint lining and may miss problems found mainly in tissue.

Blood tests can look for inflammation, infection, or immune-system markers. They are less invasive but may not identify what is happening inside one specific joint.

Ultrasound, X-ray, CT, or MRI can show fluid, thickened synovium, bone damage, or a growth. Imaging does not usually show the exact cell type or organism.

Monitoring without immediate biopsy avoids an invasive procedure. The trade-off is that diagnosis and targeted treatment may be delayed.

When tissue is needed, an ultrasound-guided needle biopsy is generally less invasive than arthroscopy but provides less direct access to the joint. Arthroscopy allows the surgeon to inspect and sample chosen areas, and possibly treat another problem, but requires small incisions and more recovery.

## When to call your healthcare team

For routine questions, contact the team if pain is not gradually improving, you are unsure about dressings or activity, or you have not received results within the timeframe you were given.

Seek prompt medical advice for:

Call emergency services for trouble breathing, fainting, severe chest pain, or signs of a severe allergic reaction such as swelling of the face or throat.

- Increasing redness, warmth, swelling, or pain
- Fever or chills
- Pus or unpleasant-smelling drainage
- Bleeding that does not stop with gentle pressure
- New numbness, weakness, or colour change beyond the biopsy area
- A dressing becoming repeatedly soaked with blood

## Common questions

Will I be asleep?

Not always. Needle biopsy is commonly performed with local anaesthetic while you are awake. Arthroscopic biopsy may use sedation, regional anaesthesia, or general anaesthesia.

Can I drive home?

Not after sedation or general anaesthesia. Arrange a responsible adult to take you home. Even after local anaesthetic, driving may be unsafe if the biopsy affects your ability to control the vehicle.

How painful is a synovial biopsy?

The numbing injection may sting briefly. During a needle biopsy, you may feel pressure or pulling. Soreness afterward is common, especially after arthroscopy, but severe or worsening pain needs medical advice.

When will I know the results?

Microscope results commonly take several days. Cultures and specialized tests can take longer, sometimes several weeks.

Will I need stitches?

Needle biopsy sites usually need only a small dressing. Arthroscopy cuts may be closed with stitches, adhesive strips, or skin glue.

What if the biopsy does not find anything?

A non-diagnostic result does not necessarily mean the joint is normal. Your team may review the samples, repeat other tests, monitor the joint, or discuss another biopsy.

## Sources

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