PROCEDURE

Kidney biopsy

A kidney biopsy removes a tiny tissue sample so it can be examined for damage or disease.

PURPOSE
Diagnose kidney damage and guide treatment

PROCEDURE TYPE
Diagnostic, minimally invasive, usually ultrasound-guided

WHERE IT IS DONE
Hospital radiology department or procedure room

ANAESTHESIA
Local anaesthetic, sometimes with moderate sedation

HOW LONG IT TAKES
About 30 to 60 minutes

PREPARATION
Blood tests, medicine review, and sometimes fasting

RECOVERY
Several hours' observation; no driving home

MAIN RISKS
Bleeding, pain, infection, inadequate sample

RESULTS
Usually several days; specialized testing may take longer

Overview

A kidney biopsy removes a very small sample of kidney tissue for examination under a microscope. It is also called a renal biopsy.

Most kidney biopsies are percutaneous biopsies. This means a doctor passes a thin biopsy needle through the skin, usually using ultrasound to guide it. The sample may show inflammation, scarring, infection, rejection of a transplanted kidney, or another pattern of injury.

The biopsy does not test how well your kidneys work by itself. Your healthcare team interprets it alongside blood tests, urine tests, scans, symptoms, and medical history.

Why the procedure is performed

A biopsy may be offered when other tests cannot explain a kidney problem or when the exact type of damage could change treatment.

Possible reasons include:

A biopsy can also show how much active inflammation and permanent scarring are present. This may help your team decide whether treatment is likely to help and which treatment is most appropriate.

Not every abnormal kidney test needs a biopsy. In some situations, blood and urine results already provide enough information.

- A sudden or unexplained decline in kidney function
- Persistent protein or blood in the urine
- Suspected inflammation of the kidney filters
- Possible kidney involvement from an immune system condition
- An unclear kidney mass, although masses are biopsied differently
- Problems with a transplanted kidney, including possible rejection
- Checking how established kidney disease has affected the tissue

Who should and should not have it

You may be offered a biopsy if the result is likely to clarify your diagnosis, guide treatment, or provide useful information about a transplanted kidney. The expected benefit should be weighed against your individual bleeding risk and other health concerns.

A percutaneous biopsy may be avoided or delayed when:

Having one working kidney does not automatically rule out a biopsy. Pregnancy, body size, kidney position, and other medical conditions may also change how the procedure is planned. In some cases, a biopsy through a vein or a surgical biopsy may be safer than a needle through the back.

- Blood pressure is severely high and not yet controlled
- Blood does not clot normally or platelet levels are too low
- A blood-thinning medicine cannot be paused safely
- There is an active infection near the needle site

- You cannot safely remain still or briefly hold your breath
- Imaging cannot identify a safe path to the kidney
- A kidney structure problem makes needle access unsafe

How to prepare

Follow the treating facility's own instructions first, because preparation and medicine rules differ between hospitals.

Tell your team about all prescription medicines, over-the-counter medicines, vitamins, and supplements you take. This is especially important for anticoagulants and antiplatelet medicines, which reduce blood clotting, and for pain relievers such as aspirin or ibuprofen.

Do not stop a prescribed blood thinner like warfarin or apixaban on your own. Your team will decide whether it can be paused and how to manage the reason you take it.

Before the biopsy, you will usually have blood tests to check your blood count, kidney function, and ability to clot. You may also provide a urine sample. Ultrasound or another scan may be used to review the kidney's position.

You may need to stop eating and drinking for several hours if sedation is planned. If only local anaesthetic is being used, fasting instructions may be different.

Arrange for someone to take you home. Bring a current medicine list and tell the team about allergies, pregnancy, previous bleeding problems, or reactions to anaesthetic medicines.

What happens during the procedure

For a biopsy of your own kidney, you will usually lie on your stomach with support under your body. For a transplanted kidney, you will normally lie on your back because the transplant is closer to the front of the abdomen.

Your blood pressure, pulse, and oxygen level will be monitored. An ultrasound probe is used to locate the kidney and choose a safe needle path.

The skin is cleaned, and local anaesthetic is injected to numb the area. This may sting briefly. You may also receive medicine to help you relax, but general anaesthesia is not usually needed.

A small cut may be made in the skin. The doctor guides a spring-loaded biopsy needle toward the kidney. You will be asked to stay still and may need to hold your breath for a few seconds. The needle can make a clicking sound.

More than one sample is often taken so the laboratory has enough tissue. Pressure and a dressing are then applied to the biopsy site.

Recovery and what to expect afterward

Mild soreness or bruising around the biopsy site is common. Simple pain relief may be recommended. Ask before taking aspirin, ibuprofen, or similar medicines because they can increase bleeding.

Once you are fully awake and your team says it is safe, you can usually drink and eat normally.

You will rest in bed while staff check your blood pressure, pulse, urine, and biopsy site. Observation commonly lasts several hours. Some people stay overnight because of their health, the biopsy timing, or concerns during monitoring.

Avoid strenuous exercise and heavy lifting for the period given by your facility, often several days to two weeks. Gentle walking and usual light activities can generally restart sooner.

Do not drive yourself home. Sedation, soreness, and the small risk of delayed bleeding can make driving unsafe. Follow the specific driving restriction provided by your team.

Many people return to desk-based work after a few days. Work involving lifting or intense physical effort may require more time off.

Risks and possible complications

Bleeding is the main risk. A small amount of blood may appear in the urine, but visible blood should be reported according to your discharge instructions. More significant bleeding can cause clots, worsening pain, dizziness, or a fall in blood count. It may require observation, a blood transfusion, or a procedure to block the bleeding blood vessel.

Other possible complications include:

An abnormal artery-to-vein connection is called an arteriovenous fistula. Many close without treatment, but some need monitoring or a procedure if they cause symptoms.

Serious complications are uncommon, but no biopsy is risk-free. Your team can explain how your health and medicines affect your personal risk.

- Pain or a collection of blood near the kidney
- Infection at the needle site or around the kidney
- An abnormal connection between an artery and vein

- Injury to a nearby structure
- A sample too small to provide an answer

Results and follow up

A kidney pathologist examines the tissue using different microscopes, stains, and sometimes antibody tests. These methods show different parts of the kidney and different types of damage.

Preliminary information may be available within a few days. A full report can take longer when special testing is needed. Ask when and how you will receive the result rather than assuming no news means a normal biopsy.

Your kidney specialist will discuss what was found and how certain the result is. The report may lead to treatment, a change in medicine, further testing, or continued monitoring. Sometimes the sample is not adequate, and your team may discuss whether repeating the biopsy would be useful.

Routine follow-up may include blood pressure checks and blood or urine tests. These monitor kidney function and any treatment started after the biopsy.

Alternatives

The alternatives depend on what your team is trying to learn. None provides exactly the same microscopic information as a tissue sample.

For a transplanted kidney, scans and blood tests can detect reduced function but may not reliably separate rejection from medicine toxicity or other injury.

- Blood, urine, and imaging tests: These avoid an invasive procedure but may not identify the exact type or stage of kidney injury.
- Monitoring over time: This avoids immediate biopsy risk but can delay a firm diagnosis or targeted treatment.
- Treatment based on the most likely diagnosis: This may avoid biopsy but risks using ineffective treatment or exposing you to unnecessary side effects.
- Transjugular biopsy: A sample is taken through a vein, often when bleeding risk or access makes a standard biopsy less suitable. It requires specialist interventional radiology and may provide smaller samples.

- Laparoscopic or open surgical biopsy: This allows the kidney to be seen directly but requires surgery, anaesthesia, and a longer recovery.

When to call your healthcare team

For routine questions, contact the biopsy team if soreness is not gradually improving, you are unsure when to restart medicine, or you have not received results within the expected time.

Seek urgent medical advice after the biopsy if you have:

Call emergency services for fainting, severe breathing difficulty, confusion, heavy bleeding, or severe rapidly worsening pain.

- Bright red urine or blood clots
- Difficulty or inability to pass urine
- Worsening pain in your back, side, or abdomen
- Fever, chills, redness, swelling, or drainage at the biopsy site
- Increasing weakness, dizziness, or light-headedness

Common questions

Will I be asleep?

Usually not. Local anaesthetic numbs the biopsy area, and you may receive moderate sedation to make you relaxed and drowsy. General anaesthesia is used only in selected situations.

Can I drive home?

No. Arrange for another adult to take you home. Follow your facility's instructions about when you may drive again, especially if you received sedation.

How painful is a kidney biopsy?

The local anaesthetic injection may sting. You may then feel pressure and hear a click when each sample is taken. Mild soreness afterward is common, but severe or worsening pain needs urgent assessment.

When will I know the result?

Some findings may be available within a few days. The full report can take longer because kidney tissue often needs several specialized examinations.

Will I need to stay overnight?

Many people go home after several hours of monitoring. An overnight stay may be recommended if bleeding is suspected, you have other health concerns, or the biopsy finishes late in the day.

Sources

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- Mayo Clinic. Kidney Biopsy .
- Hogan JJ, Mocanu M, Berns JS. The Native Kidney Biopsy: Update and Evidence for Best Practice . Clinical Journal of the American Society of Nephrology . 2016;11(2):354-362.
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