

# KNOWING GN

Types and Treatments  
Glomerulonephritis



## About glomerulonephritis

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# What is glomerulonephritis?



Glomerulonephritis (also called GN or glomerular disease) is a group of diseases that affect the kidneys. Your kidneys have tiny filters called glomeruli. Glomeruli remove extra fluid and waste from your blood and pass it into your urine (pee). GN damages—or causes inflammation to—these tiny filters so they can't work properly. Without treatment, GN can lead to kidney failure.



### How is GN diagnosed?

Finding blood, protein or both in your urine is the first clue you may have GN. Your doctor may order additional tests to measure your kidney function and look for other potential causes. In many cases, a kidney biopsy is required. In this test, a small sample of tissue is taken from one of your kidneys and examined under a microscope. Your doctor will look at the test results to see if you have GN, and what type.



### What causes GN?

For many people with GN, a specific cause cannot be identified. Many types of GN are related to the body's immune system failing to "turn off" properly. The immune system is meant to help your body fight off infections. Sometimes, it over-responds and damages the kidneys. In some cases, infections, medicines or other medical conditions cause GN. Most GNs are not hereditary or passed down in families.

Both adults and children can have GN, but some types are more common in adults, and some are more common in children. The symptoms and treatments for adults and children may also be different.

## How is GN treated?

Just as GN has many types and causes, treatment also varies. In some cases, GN may recover on its own. In other cases, your doctor may advise changes to your diet and treatments that lower your blood pressure and protein in your urine. In severe cases, specific treatments target the immune system to stop inflammation in the kidneys.



### Short-term treatment goals

- Stop inflammation to repair the kidney's filters (glomeruli). This helps reduce blood in the urine and stabilize kidney function
- Control blood pressure and lower protein in the urine
- Reduce swelling
- Control high cholesterol
- Manage other symptoms and side effects



### Long-term treatment goals

- Prevent kidneys from deteriorating further
- Prevent GN from recurring

## Who will be caring for you?



### Your nephrologist

A nephrologist is a doctor that specializes in treating diseases of the kidney.



### The GN team

Some sites also have a nurse (or nurse practitioner), pharmacist, dietician, and social worker.

### Their role is to:

- Educate you about your disease
- Work with you to develop a personalized treatment plan
- Work with you to find coverage for high-cost medications
- Manage disease- or treatment-related complications
- Help you manage your diet and lifestyle
- Collaborate with other healthcare providers

# SYMPTOMS OF GN

## Glomerulonephritis

Blood in the urine (hematuria)

Protein in the urine (proteinuria)

Nephritic syndrome

Nephrotic syndrome

## Symptoms

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### Blood in urine

One of the first signs of GN in adults and children can be blood in your urine (pee). This is called hematuria.

- **Microscopic:** You cannot see the blood, and only a urine test can find it
- **Macroscopic:** You can see the blood. In GN, urine may look red or tea-coloured

Although hematuria can happen when you have GN, it can also be related to exercise, infection, problems with your urinary tract (the part of your body that makes urine and carries it out), or passing a kidney stone. Reddish or pink-coloured urine can also be caused by something you ate (like beets or food colouring), some medicines (like rifampicin or nitrofurantoin), or having your menstrual period.

Your healthcare provider will do tests to find out if the blood in your urine is related to GN.

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Sometimes hematuria is a sign of a more serious kidney problem called nephritic syndrome.

### Protein in urine

Another sign of GN for adults and children is having more protein than normal in urine (normally there's very little). This is called proteinuria. This can make the urine look frothy or cause swelling.

Although proteinuria can happen when you have GN, it can also be related to exercise or infection. Your healthcare provider will do tests to find out if the extra protein in your urine is related to GN.

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If the kidneys leak a lot of protein, it can cause other serious problems like nephrotic syndrome.

### Nephritic syndrome

Nephritic syndrome is a group of symptoms that can happen when kidney filters leak lots of blood (and often excess protein) into urine.

**These symptoms include:**

- Blood in the urine (hematuria)
- More protein in the urine than normal (proteinuria)
- Higher creatinine in the blood (shows the kidneys aren't working well)
- High blood pressure (hypertension)

Children and adults may have other symptoms. Adults may feel fatigued and unable to focus. Children may feel tired, irritable, less hungry, or pee less than usual. Talk to your healthcare provider about how you or your child is feeling to help you find out if other symptoms are related to GN.

### Nephrotic syndrome

Nephrotic syndrome is a group of symptoms that can happen when kidney filters leak lots of protein into urine.

**These symptoms include:**

- A lot of protein in the urine (proteinuria) this can make urine look frothy
- Low levels of blood protein (hypoalbuminemia)
- Swelling (edema). This happens when your body holds on to extra salt and water. You may notice swelling in the face, eyes, belly, hands, and feet, and it can cause weight gain
- High cholesterol

Children and adults may have other symptoms. Adults may feel fatigued and unable to focus. Children may feel tired, irritable, less hungry, or pee less than usual. Talk to your healthcare provider about how you or your child is feeling to help you find out if other symptoms are related to GN.

# TESTING GN

## Glomerulonephritis

To diagnose GN in you or your child, your healthcare provider will do tests for blood and protein in the urine and measure how well the kidneys are working. Your healthcare provider may also look for other problems such as low levels of blood protein, high cholesterol, and high blood pressure.

Sometimes, your healthcare provider can diagnose and treat GN based only on the symptoms and basic blood and urine tests. Some people need more tests to be sure (confirm) they have GN and guide treatment. These tests may include a kidney biopsy.

### Urine tests

[Kidney biopsy for adults](#)

[Kidney biopsy for children](#)

# Urine tests

Urine (pee) tests are important for diagnosing GN in adults and children. Your healthcare team makes treatment decisions based on exactly how much protein is leaking into your urine. That's why it's important to collect a urine sample properly. There are 2 ways you may be asked to do this—giving a sample only one time or giving a urine sample over a whole day. Follow the instructions your healthcare provider gives you. If your child is giving a urine sample, help them follow the instructions from their healthcare provider.



### How to do spot urine collection

**A spot urine collection is a way to estimate about how much protein is in your urine.**

Because urine protein can change with how much you move, **it's best to collect your sample first thing in the morning.** If you are given a requisition for this test, schedule your lab visit first thing in the morning. They will give you a small container to pee in while you are there.



### How to do 24-hour urine collection

**A 24-hour urine collection gives a more exact result for how much protein is in your urine.**

If you are given a requisition for this test, you will need to go to the lab to pick up a large container for urine collection first. **You will need to collect all of your urine over 24 hours. If you miss some, you will need to start over.**

Follow these steps:

1. Get up in the morning, pee into the toilet, and flush (you don't collect your first urine of the day). This is your start time. Write your start date and time on the container label
2. Collect all your urine for the next 24 hours in the container provided. Close the container lid tightly after each use, and keep the container upright in the fridge between uses and until you bring it to the lab
3. Collect the last urine sample exactly 24 hours after your start time
4. Try to pee (empty your bladder) into the container even if you don't feel like you have to
5. Write the finish date and time on the container label
6. Bring your sample and your requisition (the form that goes with it) to the lab as soon as possible. Waiting too long could affect your test result

# Kidney biopsy for adults

A kidney biopsy is usually done using a long thin needle put through the back (flank) into the kidney. A small sample of tissue is taken from your kidney and checked under a microscope. Your healthcare provider will look at the biopsy results to decide which type of GN you have. Not everyone needs a kidney biopsy. You and your healthcare provider will decide if a biopsy is right for you.



## How to Prepare

Tell your doctor if you:

- **Are taking any medicines that could thin your blood. These include aspirin, plavix, oral anticoagulants (such as apixaban, rivaroxaban, dabigatran, warfarin), heparin, and NSAIDs (such as ibuprofen or naproxen). Your doctor may tell you to stop taking these medicines for several days before the biopsy**
- **Are allergic to any medicines, such as those used to numb the skin (anesthetics)**
- **Have had bleeding problems**
- **Are or might be pregnant**

You will have blood tests done before the kidney biopsy to see whether you have any bleeding problems. You may also have an ultrasound test of the kidney to show the best place in your kidney to put the biopsy needle.

Follow the instructions exactly about when to stop eating and drinking, or your test may be cancelled. If your doctor has instructed you to take your medicines on the day of the test, please do so using only a sip of water.

Arrange to have someone take you home after the biopsy because you may be given a medicine (sedative) to help you relax.



## How it is Done

A kidney biopsy is often done by a radiologist using ultrasound or CT scan to help guide the biopsy needle.

The biopsy may be done on either the right or the left kidney. The site will be cleaned with a special soap. Your doctor then gives you local anesthetic to numb the area where the biopsy needle will be inserted.

Your doctor puts the biopsy needle through the skin while looking at your kidney with ultrasound or another imaging technique. You will be asked to hold your breath and stay very still while the needle is put into the kidney.

The needle is removed after the tissue sample is taken. Pressure is put on the biopsy site for several minutes to stop the bleeding. Then a bandage is put on the site. The biopsy takes 15 to 30 minutes.



## What Happens after the Test

You will be asked to stay in a recovery bed for 2-6 hours after the biopsy to make sure there are no complications. If no problems develop, you can go home.

To prevent bleeding at the biopsy site, you will be told to lie down in a certain position for the next 12 to 24 hours. You may eat your normal diet.

**Do not take aspirin or anti-inflammatory medicines for a week after the biopsy. Avoid strenuous activities for 2 weeks after the biopsy, such as heavy lifting, hard running, contact sports, or other activities that might jar or jolt your kidney.**

Your doctor may have initial results in 1-3 days, but it can take up to 2 weeks to have complete biopsy results.

## WHAT ARE THE RISKS

It is normal to feel some muscle soreness in the area of the biopsy for 2 to 3 days after the biopsy. You may have a small amount of bleeding on the bandage after the biopsy. Many people will have bright red blood in their urine for the first 24 hours after the biopsy; this is expected.

There is a small chance for serious problems from a kidney biopsy, but they are rare.

- Bleeding into the muscle, which can cause soreness
- Bleeding into the kidney
- Infection of the skin at the biopsy site
- Puncturing a major blood vessel, which may need blood transfusions, renal angiography and embolization, or surgery. This is very rare



To get more information for adults and children having a kidney biopsy, see [Kidney Biopsy: Test Overview](#)

# Kidney biopsy for children

A kidney biopsy means that a small sample of tissue is taken from your child's kidney and checked under a microscope. Every procedure has some risks.



### What should I do before my child's kidney biopsy?

Your child will have to have blood tests done before the biopsy, do them within 7 days before the procedure. This makes sure your child doesn't have problems with bleeding or blood clotting.

Don't give your child anything to eat or drink after midnight the night before the kidney biopsy. Your child's stomach must be empty before having medicine to make them sleep (general anesthetic). If your child has special needs, talk to their healthcare provider to make a plan.

If your child normally takes medicine in the morning, you can give it to them with a sip of water.

If your child is taking blood thinners (like aspirin, warfarin, heparin), talk to their healthcare provider about whether it is safe to keep taking them. Your child may need to stop taking them 1 week before the biopsy.



### What happens during my child's kidney biopsy?

To keep your child still and comfortable, they will get medicine to make them sleep. You can stay with your child until they're asleep.

A radiologist will do the biopsy. They will use ultrasound to see your child's kidney. Your child will be lying on their stomach or on their back if they have a kidney transplant. The radiologist will pass a special thin needle into 1 of the kidneys to get samples. They'll usually take 3 small samples. Your child won't need stitches. They'll have a small bandage over where the needle went in.



### What happens after the biopsy?

Your child will get IV fluids until they wake up and can start drinking and eating normally.

Your child will need to lie in bed for about 6 hours after the biopsy. Then they can usually go home if there are no problems. Your child will have a blood test about 3 hours after the biopsy. If you live more than 1 hour from the hospital, plan to stay somewhere near the hospital overnight.



### How do I care for my child at home?

Leave your child's bandage on for 24 hours. If it gets wet or dirty before 24 hours, take it off and replace it with a regular, clean bandage. Your child can have a shower after 24 hours. You can give your child acetaminophen (Tylenol) for pain if they need it.

For the first 2 days after the biopsy, your child will need to limit activity. Keep them home from school or daycare, and don't let them get any exercise. After 2 days your child can go back to school, but they shouldn't do harder activities for 2 weeks.

#### These might include:

- Contact sports
- Gymnastics
- Diving and swimming
- Bicycle riding
- Rollerblading
- Hockey
- Soccer
- Skiing
- Horseback riding

### Take your child to your nearest emergency department if your child:

- Has a lot of bleeding where the biopsy was done
- Has blood in their pee that is not clearing up
- Has very bad belly pain
- Feels weak, unwell, or both

#### WHAT ARE THE RISKS

Kidney biopsies are usually low risk. The following are the most serious risks of a kidney biopsy.

#### These risks are very rare:

- Pain that lasts more than 12 hours
- Bleeding around or into the kidney
- Infection
- Creating a shortcut in the blood flow from an artery to a vein in the kidney (fistula)



To get more information for adults and children having a kidney biopsy, see [Kidney Biopsy: Test Overview](#)