CONDITION

# Membranous nephropathy

Membranous nephropathy is an immune-related kidney condition that causes protein to leak into the urine.

**WHAT IT IS**
Immune-related damage to the kidneys' filtering units

**BODY SYSTEM**
Kidneys and urinary system

**MAIN SYMPTOMS**
Foamy urine, swelling, fatigue, unexplained weight gain

**WHAT CAUSES IT**
Immune attack, sometimes linked to another condition

**HOW IT IS DIAGNOSED**
Kidney biopsy and anti-PLA2R antibody blood testing

**MAIN TREATMENT**
Kidney protection, fluid control, and sometimes immune-suppressing treatment

**CAN IT BE CURED?**
Sometimes - lasting remission can occur

**IS IT AN EMERGENCY?**
Sometimes - sudden breathlessness may signal a blood clot

**LONG-TERM OUTLOOK**
Many reach remission; some develop chronic kidney failure

## Overview

Membranous nephropathy is a kidney condition that affects the glomeruli. These are tiny bundles of blood vessels that filter waste and extra water from your blood.

The condition develops when immune proteins collect along the filtering membrane. This makes the filter thicker and more likely to leak protein into the urine. Despite the name, it does not mean that a membrane has formed over the kidney.

Losing a large amount of protein can cause nephrotic syndrome . This is a group of problems that includes high urine protein, low protein levels in the blood, swelling, and often high cholesterol.

Some people improve without immune-suppressing treatment. Others need treatment

because protein loss continues, kidney function declines, or complications develop. Changes can happen slowly, so regular urine and blood tests are important even when you feel well.

Doctors often describe the condition as primary when it results from an immune reaction directed at the kidney. It is called secondary when another condition, infection, medicine, or cancer appears to be responsible.

## Symptoms

Membranous nephropathy may not cause symptoms at first. It is sometimes found after a routine urine test shows protein.

Possible symptoms include:

Some people develop high blood pressure. A small amount of blood may also be found in the urine, although it may not be visible.

Symptoms do not always show how active the condition is. Swelling may improve while protein leakage continues, or kidney function may change before you notice anything unusual.

- Foamy or frothy urine caused by excess protein
- Swelling around the eyes, ankles, legs, or abdomen
- Weight gain caused by retained fluid
- Tiredness or reduced stamina
- Reduced appetite
- Needing to urinate more often at night

## Causes and risk factors

In primary membranous nephropathy, the immune system makes antibodies that target proteins associated with the kidney filter. Antibodies normally help defend the body against infection. In this condition, they contribute to inflammation and damage within the glomeruli.

The most commonly identified antibody targets a protein called phospholipase A2 receptor , usually shortened to PLA2R . Less commonly, other targets such as THSD7A may be involved. Not everyone has a detectable antibody.

Secondary membranous nephropathy may be associated with:

Finding one of these conditions does not automatically prove that it caused the kidney problem. Your clinical team will consider the timing, test results, biopsy findings, and other risk

factors.

Membranous nephropathy is not usually caused by something you ate or by failing to exercise. It is not contagious, and it is not generally considered an inherited condition.

- Autoimmune conditions, including lupus
- Infections such as hepatitis B, hepatitis C, or syphilis
- Certain cancers
- Some medicines, including particular anti-inflammatory or older immune-modifying medicines

## Diagnosis

Diagnosis usually begins with urine and blood tests.

A urine test measures how much protein is being lost. This may use a protein-to-creatinine or albumin-to-creatinine ratio from a single sample. In some situations, urine may be collected over 24 hours.

Blood tests can check:

A kidney biopsy often confirms the diagnosis. During a biopsy, a needle is used to remove a very small kidney tissue sample under local anaesthetic and imaging guidance. The sample is examined under a microscope for the characteristic thickening and immune deposits.

In selected adults with nephrotic syndrome and clearly positive anti-PLA2R antibodies, a biopsy may not always be needed. A biopsy can still be helpful if kidney function is reduced, the findings are unusual, or another kidney problem is possible.

Tests for secondary causes may include infection screening, autoimmune blood tests, a medicine review, and cancer screening appropriate for your age, symptoms, and personal risks.

- Creatinine and estimated glomerular filtration rate, or eGFR, to assess kidney function
- Albumin, a blood protein that may fall because it is lost in urine
- Cholesterol and other blood fats
- Anti-PLA2R antibodies
- Possible secondary causes, guided by your history and examination

## Treatment and management

Treatment aims to reduce protein loss, control swelling and blood pressure, prevent complications, and protect kidney function. Not everyone needs immune-suppressing treatment straight away.

Supportive care may include:

Blood clots are a particular concern when albumin is very low. An anticoagulant like warfarin or apixaban , which reduces blood clotting, may be considered for some people. This decision balances clot risk against the possibility of serious bleeding.

If the condition has a secondary cause, treating that cause may help. This could mean treating an infection, managing an autoimmune condition, or stopping a suspected medicine under medical supervision.

Immune-suppressing treatment may be offered when there is a significant risk of progressive kidney damage or when severe protein loss continues. Options include rituximab, cyclophosphamide with corticosteroids like prednisone or hydrocortisone , or calcineurin inhibitors such as tacrolimus or ciclosporin. The choice is based on kidney function, antibody levels, protein loss, other health conditions, and treatment risks.

These treatments can increase the risk of infection and cause other important side effects. Screening, vaccines, blood tests, and monitoring may be needed before and during treatment.

A fall in immune antibody levels can happen before urine protein improves. The kidney filter may take months to recover, so treatment is not usually judged from a single urine result.

- Medicines that lower blood pressure and reduce urine protein, often from the ACE inhibitor or angiotensin receptor blocker groups
- Diuretics like furosemide or hydrochlorothiazide , sometimes called water tablets, to reduce swelling
- Moderating salt intake to help control fluid retention
- Treatment for high cholesterol when appropriate
- Regular monitoring of urine protein, kidney function, albumin, and blood pressure

## Complications

Heavy protein loss changes the balance of proteins involved in fluid movement, immunity, and blood clotting. Possible complications include:

Treatment can also cause complications. Regular follow-up helps identify infection, changes in blood counts, medication effects, and declining kidney function early.

- Blood clots in a leg, lung, or kidney vein
- Infections, especially with severe nephrotic syndrome or immune suppression
- Acute kidney injury, meaning a sudden fall in kidney function
- Chronic kidney condition and, in some people, kidney failure
- High cholesterol and increased cardiovascular risk
- Poor nutrition or muscle loss when protein loss is prolonged

## Prevention

Primary membranous nephropathy usually cannot be prevented. It is caused by an immune reaction rather than a known lifestyle choice.

You can help protect your kidneys after diagnosis by taking prescribed medicines as directed, attending monitoring appointments, and discussing over-the-counter medicines before using them. Non-steroidal anti-inflammatory drugs, or NSAIDs, can sometimes worsen kidney function or fluid retention.

When a medicine or treatable infection is responsible, addressing that trigger may reduce further immune activity. This does not guarantee that kidney changes will immediately reverse.

## Living with it and what to expect

The course differs from person to person. Some people enter remission without immune-suppressing treatment. Others have persistent protein loss, respond after treatment, or experience a relapse later.

Remission means that urine protein has fallen substantially or returned close to normal. It does not always mean the condition can never return. Kidney recovery often takes months, even after the immune process becomes less active.

Follow-up usually includes blood pressure checks and blood and urine testing. Anti-PLA2R antibody levels may also be followed when they were positive at diagnosis. Appointments may become less frequent during stable remission, but long-term monitoring remains useful.

Many people continue working, exercising, travelling, and managing family life. Swelling or fatigue may temporarily limit activity during an active phase. Dietary changes should be practical and should not remove large food groups without advice, especially if you are losing protein or taking diuretics.

Kidney function remains stable for many people. Others develop lasting chronic kidney impairment, particularly when heavy protein loss continues or kidney function is already declining. If kidney failure develops, dialysis or kidney transplantation may be needed. Membranous nephropathy can occasionally recur in a transplanted kidney, but recurrence is not inevitable.

If you are planning a pregnancy, discuss it in advance with your kidney and pregnancy teams. Active nephrotic syndrome can increase pregnancy risks, and some kidney or immune medicines are not suitable around conception or during pregnancy.

## When to get medical help

Arrange routine medical follow-up if you notice new or increasing swelling, persistent foamy urine, unexpected weight gain, higher home blood pressure readings, or possible medicine side effects. These changes may need testing but are not usually emergencies.

Seek urgent same-day advice if you have:

Call emergency services for sudden shortness of breath, chest pain, coughing up blood, fainting, or severe weakness. These can be signs of a blood clot in the lungs or another serious problem.

Sudden facial drooping, arm weakness, difficulty speaking, or a new severe neurological symptom also requires emergency care.

- A painful, warm, or newly swollen leg
- Much less urine than usual
- Rapidly worsening swelling
- Fever or signs of infection while taking immune-suppressing treatment
- Ongoing vomiting or diarrhoea that could cause dehydration

## Common questions

Is membranous nephropathy the same as nephrotic syndrome?

No. Membranous nephropathy is a specific pattern of kidney filter damage. Nephrotic syndrome describes the effects of heavy protein loss, including swelling, low blood albumin, and high cholesterol. Membranous nephropathy is one cause of nephrotic syndrome.

Can membranous nephropathy go away?

It can enter partial or complete remission, sometimes without immune-suppressing treatment and sometimes after treatment. Doctors usually use the word "remission" rather than "cure" because protein leakage can return.

Will I need dialysis?

Not necessarily. Many people maintain useful kidney function or reach remission. The risk is greater when heavy protein loss continues, kidney function falls, or scarring is already present. Trends over several tests are more informative than a single result.

Does membranous nephropathy mean I have cancer?

No. Most people diagnosed with membranous nephropathy do not receive a cancer diagnosis. Certain cancers can occasionally be associated with the condition, so your clinician may recommend screening based on your age, symptoms, biopsy findings, and usual screening schedule.

Can membranous nephropathy come back?

Yes. A relapse can happen after partial or complete remission. It may first appear as rising urine protein or antibody levels rather than obvious symptoms. A relapse does not automatically mean that kidney failure will occur, but it does need reassessment.

What should I eat with membranous nephropathy?

There is no single diet that treats the immune cause. Limiting excess salt may help swelling and blood pressure. Your needs may change with kidney function, potassium levels, medicines, and the amount of protein being lost, so highly restrictive diets should be avoided unless specifically advised.

## Sources

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