CONDITION

# Diabetic kidney disease

Diabetic kidney disease is long-term kidney damage caused by diabetes.

**WHAT IT IS**
Kidney damage caused by long-term diabetes

**BODY SYSTEM**
Kidneys and urinary system

**MAIN SYMPTOMS**
No early symptoms, swelling, tiredness, foamy urine

**WHAT CAUSES IT**
High blood sugar damaging kidney filters

**HOW IT IS DIAGNOSED**
Repeated urine albumin and blood kidney-function tests

**MAIN TREATMENT**
Diabetes, blood pressure, and kidney-protective medicines

**CAN IT BE CURED?**
No, but progression can often be slowed

**IS IT AN EMERGENCY?**
Sometimes, with severe breathlessness or very little urine

**LONG-TERM OUTLOOK**
Often manageable; some people develop kidney failure

## Overview

Diabetic kidney disease is kidney damage that develops in some people with diabetes. It is a form of chronic kidney disease, meaning the damage or reduced kidney function has lasted for at least three months.

Your kidneys filter waste and extra water from your blood. They also help control blood pressure, balance minerals, support red blood cell production, and keep bones healthy.

High blood sugar can gradually damage the kidneys' tiny blood vessels and filters. The filters may begin leaking albumin, an important blood protein, into the urine. Over time, the kidneys may also become less effective at removing waste.

The condition usually develops slowly and often causes no early symptoms. Urine and blood tests can find changes before you feel unwell. Early treatment can reduce further damage and

lower the risk of heart and circulation problems.

Not everyone with diabetes develops kidney disease. Good diabetes and blood pressure management can reduce the risk, but the condition can still occur despite careful self-management.

## Symptoms

Early diabetic kidney disease usually has no noticeable symptoms. You may pass a normal amount of urine and feel well even when tests show albumin leakage or reduced kidney function.

As kidney function declines, symptoms can include:

These symptoms can have other causes and do not confirm diabetic kidney disease. Some people with advanced kidney damage still have few symptoms.

- Swelling around the ankles, feet, legs, hands, or eyelids
- Foamy or frothy-looking urine
- Tiredness, weakness, or difficulty concentrating
- Loss of appetite, nausea, or an unusual taste
- Itchy or dry skin
- Muscle cramps, especially at night
- Shortness of breath caused by fluid build-up or anaemia
- Needing to urinate more often at night

## Causes and risk factors

Diabetes exposes the kidneys' filters to high levels of glucose in the blood. This changes pressure within the filters and can damage their delicate blood vessels. High blood pressure adds further strain.

Risk increases with longer exposure to high blood sugar or high blood pressure. Other risk factors include:

These factors do not mean kidney damage is certain. Diabetic kidney disease can also develop without every recognised risk factor.

Diabetes is not the only cause of abnormal kidney tests. Infections, medicines, urinary

blockage, inherited conditions, and other kidney disorders can cause similar findings. A healthcare professional may investigate another cause if the pattern is unusual.

- Smoking
- Heart or blood vessel conditions
- Higher body weight
- A family history of kidney disease
- Previous sudden kidney injury
- Older age
- Certain ethnic or genetic backgrounds

## Diagnosis

Two main tests identify and monitor diabetic kidney disease.

A urine albumin-to-creatinine ratio, shortened to UACR or ACR, measures albumin leaking into your urine. Creatinine is used to account for how concentrated the urine is.

A blood test measures creatinine and estimates your glomerular filtration rate, or eGFR. This indicates how well your kidneys filter blood. A lower result suggests reduced kidney function, although age and other factors affect the estimate.

One abnormal result does not always mean chronic kidney damage. Exercise, fever, infection, menstruation, dehydration, very high blood sugar, and temporary illness can affect results. Tests are usually repeated to confirm that changes persist.

Your blood pressure, diabetes control, medicines, and previous results are also reviewed. An ultrasound may check kidney size or look for a blockage. A kidney biopsy, which removes a tiny tissue sample, is not routinely needed but may be considered if another condition is suspected.

Screening generally begins when type 2 diabetes is diagnosed. For type 1 diabetes, routine screening usually begins after five years. More frequent testing may be needed when albumin is present, kidney function is reduced, or treatment changes.

## Treatment and management

Treatment aims to protect remaining kidney function and reduce the risk of heart attack, stroke, and kidney failure. Your plan depends on your diabetes, kidney results, blood pressure, other conditions, and medicines.

Blood sugar management is important. Treatment may need adjusting as kidney function changes because the kidneys remove some diabetes medicines and insulin from the body.

Managing blood pressure reduces stress on kidney filters. ACE inhibitors and angiotensin receptor blockers, or ARBs, are commonly used when someone with diabetes has high blood pressure and albumin in the urine. Blood potassium and kidney function usually need monitoring after these medicines are started or changed.

SGLT2 inhibitors can protect the kidneys and heart in many people with type 2 diabetes and chronic kidney disease. They are not suitable for everyone. Other treatments may include GLP-1 receptor agonists for blood sugar and cardiovascular risk, finerenone for selected people with persistent albumin in the urine, or cholesterol-lowering medicines.

Management may also involve:

Do not stop prescribed medicines because of one abnormal result. Some kidney-protective medicines cause a small expected change in eGFR when started. Your healthcare team can decide whether you need monitoring or a treatment change.

Advanced kidney failure may require dialysis or a kidney transplant. Most people diagnosed early do not need these treatments immediately, and many never need them.

- Reducing salt if advised, particularly for blood pressure or swelling
- Eating an appropriate amount of protein instead of following a high-protein diet
- Regular physical activity suited to your health and mobility
- Stopping smoking
- Monitoring weight, blood pressure, blood sugar, and kidney tests
- Reviewing prescription, over-the-counter, and herbal products

## Complications

Diabetic kidney disease can increase the risk of:

Heart and circulation complications may develop before kidney failure, so treatment protects both the kidneys and cardiovascular system.

- Gradual loss of kidney function and kidney failure
- Heart attack, stroke, and heart failure
- High blood pressure that becomes harder to control
- Fluid retention and swelling

- High potassium, which can affect heart rhythm
- Anaemia
- Mineral and bone problems
- Changes in how medicines are processed

## Prevention

Diabetic kidney disease cannot always be prevented. Genetics, duration of diabetes, ageing, and other conditions affect risk. Developing it does not mean you have failed to manage your diabetes.

You may reduce the risk or slow early changes by keeping blood sugar and blood pressure within agreed targets. Attend routine urine and blood tests even if you feel well because early damage is usually silent.

Avoid smoking and take prescribed kidney-protective medicines as directed. Regular movement, balanced eating, and cholesterol management also support kidney and heart health.

Non-steroidal anti-inflammatory drugs like ibuprofen or naproxen , or NSAIDs, include ibuprofen and naproxen. They can reduce blood flow to the kidneys, especially during dehydration or illness. Ask a pharmacist or healthcare professional before using them if you have reduced kidney function. Herbal or "natural" products are not automatically kidney-safe.

Vomiting, diarrhoea, or fever can cause dehydration and temporarily worsen kidney function. Your diabetes team may provide a sick-day plan explaining which medicines need review during a dehydrating illness.

## Living with it and what to expect

Diabetic kidney disease usually changes over months or years. Kidney function may remain stable for long periods or decline gradually. A single eGFR result cannot predict your course; the trend over time is more useful.

Albumin levels can rise and fall. Treatment may reduce the amount, although this does not necessarily mean all kidney damage has disappeared. Regular testing shows whether the overall pattern is stable.

Many people continue working, exercising, travelling, and managing family life. Daily care often involves medicines, blood and urine tests, and management of diabetes and blood pressure.

You may be referred to a kidney specialist if results worsen quickly, kidney function becomes significantly reduced, treatment is difficult to balance, or the cause is uncertain.

Food advice becomes more individual as kidney function declines. Severe restrictions are not automatically needed in early disease. If potassium, phosphate, fluid balance, or nutrition becomes a concern, a kidney dietitian can help without unnecessarily limiting your diet.

Feeling worried, frustrated, or guilty is common. Support from your healthcare team, diabetes education services, peer groups, or counselling may help.

## When to get medical help

Arrange routine follow-up if you have missed kidney screening, notice ongoing ankle swelling or foamy urine, or have questions about medicine safety.

Contact your healthcare team promptly if swelling is increasing, your urine output has clearly decreased, or you are repeatedly vomiting and struggling to drink.

Seek urgent medical help for:

Call emergency services for severe breathing difficulty, chest pain, collapse, or unresponsiveness. These symptoms may indicate fluid overload, a heart problem, a serious potassium disturbance, or another emergency. Do not wait for a routine appointment.

- New or worsening shortness of breath
- Severe weakness, fainting, or marked confusion
- A very fast, slow, or irregular heartbeat
- Little or no urine, especially during an illness
- Rapidly increasing swelling or sudden weight gain

## Common questions

Can diabetic kidney disease be reversed?

Established scarring usually cannot be reversed. However, albumin leakage may decrease and kidney function may remain stable with treatment. Managing blood sugar, blood pressure, and cardiovascular risk can slow further damage.

Does protein in my urine mean my kidneys are failing?

No. Albumin in the urine can be an early sign of kidney damage, long before kidney failure. Temporary leakage can also occur during infection, strenuous exercise, or very high blood

sugar, so an abnormal result is usually repeated.

Will I need dialysis?

Many people do not. The likelihood depends on your current kidney function, rate of change, albumin level, blood pressure, diabetes control, and other conditions. Dialysis is generally considered only when kidney function becomes severely reduced and causes problems that cannot be managed another way.

What should I eat?

There is no single diabetic kidney diet. Earlier stages usually call for balanced eating, an appropriate protein intake, and limiting excess salt. Potassium, phosphate, or fluid restrictions are normally based on blood tests and kidney function.

Can I take ibuprofen if I have diabetic kidney disease?

Ibuprofen and similar NSAID painkillers can worsen kidney function, particularly during dehydration or when combined with certain blood pressure medicines. Check with a pharmacist or healthcare professional who knows your kidney results. Do not stop prescribed medicines to make room for an NSAID.

How often will my kidneys be checked?

People with diabetes usually have urine albumin and eGFR checked during regular diabetes reviews. Testing is often more frequent when results are abnormal, kidney function is changing, or medicines affecting kidney function or potassium are adjusted.

## Sources

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