
Kidney disease

Summary

- You can look after your kidneys by eating healthy food, staying active and maintaining a healthy weight.
 - Many diseases can affect your kidneys.
 - In most cases, early diagnosis and good management can prevent a condition from worsening and reduce the risk of kidney failure.
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Each year, more than 500,000 Australians consult their doctors about kidney disease and urinary tract infections. One in three Australian adults is at increased risk of developing chronic kidney disease, and one in ten has some sign of chronic kidney disease.

During their lifetime, one third of women and one in 10 men will suffer a bladder infection; one in 35 women and one in 10 men will have kidney stones.

What is kidney disease?

Your kidneys are two bean-shaped organs that act as your body's waste filtration system. They filter your blood 12 times per hour. Excess water and unwanted chemicals or waste in the blood are disposed of as urine (wee).

Kidney disease is when your kidneys are damaged in some way and are not filtering your blood effectively.

Symptoms of kidney disease

Kidney disease is called a 'silent disease' as there are often few or no symptoms. In fact, you can lose up to 90 per cent of your kidneys' functionality before experiencing any symptoms. Some signs and symptoms include:

- a change in the frequency and quantity of urine you pass, especially at night (usually an increase at first)
- blood in your urine (haematuria)
- changes in the appearance of your urine
- puffiness around your legs and ankles (oedema)
- pain in your back (under the lower ribs, where the kidneys are located)
- pain or burning when you pass urine
- high blood pressure.

If your kidneys begin to fail, waste products and extra fluid build up in your blood. This, and other problems, gradually leads to:

- tiredness and inability to concentrate
- generally feeling unwell
- loss of appetite
- nausea and vomiting
- shortness of breath
- itching
- bad breath and a metallic taste in the mouth.

Treatment for kidney disease

If detected early enough, the progress of kidney disease can be slowed and sometimes even prevented. In the early stages, changes to diet and medication can help to increase the life of your kidneys.

If kidney function is reduced to less than 10 per cent of normal, the loss of function must be replaced by dialysis or a **kidney transplant**. Dialysis is a treatment for kidney failure that removes waste products and extra water from the blood by filtering it through a special membrane (fine filter).

Risk factors for kidney disease

You are more at risk of developing chronic kidney disease if you:

- have **high blood pressure**
- have **diabetes**
- have established heart problems (heart failure or past heart attack) or have had a stroke
- are obese
- are over 60 years of age
- have a family history of kidney failure
- smoke
- have a history of acute kidney injury
- are of Aboriginal or Torres Strait Islander origin.

High blood pressure and kidney disease

High blood pressure (hypertension) is increased pressure inside the arteries that carry blood from your heart to all parts of your body. Untreated, high blood pressure can damage your kidneys.

Also, high blood pressure can develop as a result of kidney disease or **renal artery stenosis** (narrowing of the main artery to one or both kidneys). Your kidneys control the amount of fluid in your blood vessels and produce a hormone called renin that helps to control blood pressure.

Diabetes and kidney disease

About 20 to 30 per cent of people with diabetes develop a type of kidney disease called **diabetic nephropathy**. This is a serious disease and may worsen other diabetic complications such as nerve and eye damage, as well as increasing the risk of cardiovascular (heart) disease.

Diabetic nephropathy is the main cause of **kidney failure** (also known as 'end-stage kidney disease' or ESKD).

Kidney disease and cardiovascular risks

Cardiovascular disease is the most common cause of death in people with chronic (ongoing) kidney disease. Compared to the general population, people with chronic kidney disease are two to three times more likely to have cardiovascular (heart and blood vessel) problems such as:

- **angina**
- **heart attack**
- **stroke**
- **heart failure**.

This increased risk is partly caused by factors common to both chronic kidney disease and cardiovascular disease, such as **high blood pressure**. However, researchers are discovering that chronic kidney disease is, in itself, an important risk factor for the development of cardiovascular disease, and a history of cardiovascular disease is a risk factor for the development of chronic kidney disease.

The kidneys regulate water and salts, remove certain wastes and make various hormones. Kidney disease increases the risk of cardiovascular disease in many ways, including:

- high blood pressure – the kidneys help to regulate blood pressure by producing a hormone called renin. They also help to regulate the amount of salt and fluid in the body
- heart strain – holding excess fluid in the body puts strain on the heart and increases the risk of complications such as left ventricular hypertrophy (enlarged left heart chamber), which can cause heart failure
- stiff arteries – kidneys make a hormone that helps to regulate the use of calcium throughout the body. A person with chronic kidney disease may develop calcified (stiffened) arteries and heart valves, perhaps

caused by hormones not being produced efficiently

- increased blood fats (hyperlipidaemia) – some people with chronic kidney disease have increased levels of low-density lipoprotein (LDL) cholesterol, which may be caused by disturbed hormone levels. High levels of LDL cholesterol is a known risk factor in the development of cardiovascular disease
- blood clots – the blood of people with some types of chronic kidney disease, and those with kidney failure, is prone to clotting. A clot (thrombus) lodged within a blood vessel may cut off the blood supply. This increases the risk of many complications, including heart attack and stroke. A clot in one of the kidney arteries may cause high blood pressure.

Diagnosis of kidney disease

Early diagnosis and optimal management can often prevent kidney damage from becoming worse and reduce the risk of kidney failure.

Chronic kidney disease often has very few symptoms, or only general symptoms, such as tiredness, headaches and feeling sick. The doctor may begin by reviewing your medical history and performing a physical examination.

The diagnostic tests for kidney disease chosen by your doctor depend on factors including your symptoms, age, medical history, lifestyle and general health. Tests for kidney disease include:

- urine tests
- blood tests
- blood pressure test
- imaging
- biopsy.

Urine tests for kidney disease

Damaged or inflamed kidneys 'leak' substances such as blood or protein into the urine. The preferred test for detecting protein in the urine is a urine albumin-to-creatinine ratio (urine ACR) test, which shows the amount of albumin (a type of protein) in the urine.

A urine ACR test should be done at least once a year if the person has diabetes or high blood pressure, and every two years if the person has any of the other identified risk factors for developing chronic kidney disease.

A urine ACR test is performed by sending a sample of your urine to a laboratory for analysis.

Blood tests for kidney disease

The best measure of kidney function is the glomerular filtration rate (GFR), which can be estimated from a blood test that checks the blood for creatinine (a waste product made by muscle tissue).

A normal GFR result is higher than 90 mL/min/1.73 m². If the result is persistently less than 60 mL/min/1.73 m² for at least three months, this confirms that the person has chronic kidney disease.

Blood tests can reveal other abnormalities of kidney function, such as:

- high levels of acids (acidosis)
- **anaemia** (insufficient red blood cells or haemoglobin, the protein in red blood cells that transports oxygen)
- high levels of potassium (hyperkalaemia)
- low levels of salt (hyponatraemia)
- changes to the levels of calcium and phosphate.

Imaging tests for kidney disease

Tests that create various pictures or images may include:

- x-rays – to check the size of the kidneys and look for kidney stones
- cystogram – a bladder x-ray
- voiding cystourethrogram – where the bladder is x-rayed before and after urination
- ultrasound – sound waves are 'bounced' off the kidneys to create a picture. Ultrasound may be used to check

the size of the kidneys. Kidney stones and blood vessel blockages may be visible on ultrasound

- computed tomography (CT) – x-rays and digital computer technology are used to create an image of the urinary tract, including the kidneys
- magnetic resonance imaging (MRI) – a strong magnetic field and radio waves are used to create a three-dimensional image of the urinary tract, including the kidneys.
- radionuclide scan.

Biopsy for kidney disease

A biopsy means that a small piece of tissue is taken for testing in a laboratory. Biopsies used in the investigation of kidney disease may include:

- **kidney biopsy** – the doctor inserts a special needle into the back, under local anaesthesia, to obtain a small sample of kidney tissue. A kidney biopsy can confirm a diagnosis of chronic kidney disease.
- **bladder biopsy** – the doctor inserts a thin tube (cystoscope) into the bladder via the urethra. This allows the doctor to view the inside of the bladder and check for abnormalities. This procedure is called a cystoscopy. The doctor may take a biopsy of bladder tissue for examination in a laboratory.

Your doctor may arrange other tests, depending on the suspected cause of your kidney disorder.

Prevention of kidney disease

Medication and changes to lifestyle, along with an early referral to a kidney specialist (nephrologist), can prevent or delay kidney failure.

Healthy lifestyle choices to keep your kidneys functioning well include:

- Eat lots of fruit and vegetables including legumes (peas or beans) and grain-based food such as bread, pasta, noodles and rice.
- Eat lean meat such as chicken and fish each week.
- Eat only small amounts of salty or fatty food.
- Drink plenty of water instead of other drinks. Minimise consumption of sugary soft drinks.
- Maintain a healthy weight.
- Stay fit. Do at least 30 minutes of physical activity that increases your heart rate on five or more days of the week, including walking, lawn mowing, bike riding, swimming or gentle aerobics.
- If you don't smoke, don't start. If you do, quit. Call the **Quitline** or ask your doctor for help with quitting.
- Limit your alcohol to no more than two small drinks per day if you are male, or one small drink per day if you are female.
- Have your blood pressure checked regularly.
- Do things that help you relax and reduce your stress levels.

A range of medication is available for high blood pressure. Different blood pressure medications work in different ways, so it is not unusual for more than one type to be prescribed. The dose may change according to your needs.

Where to get help

- Your doctor
- **Kidney Health Australia** helpline Tel. 1800 454 363
- **Quitline** Tel. 13 78 48

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