

Fact sheet

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Make the Link: Chronic Kidney Disease, Diabetes and Cardiovascular Disease

Chronic kidney disease (CKD), diabetes and cardiovascular disease are harmful chronic diseases that commonly occur together. These three conditions share causes and risk factors. They also have similar treatment strategies.

What is CKD?

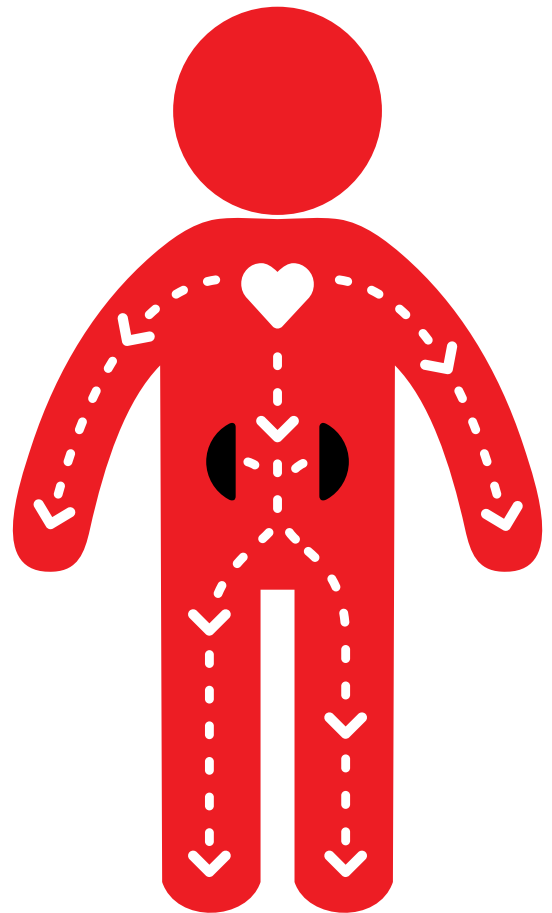
CKD is a condition where your kidneys no longer filter the body's blood as well as they should. This leads to the build-up of waste in your blood.

Inside each kidney there are about one million tiny filters called nephrons that filter the blood and separate out excess water and waste products – which then leave the body via your urine (wee).

The filtered blood with waste products removed then continues on its journey through your body. Most kidney diseases attack the nephrons and stop them from doing their job properly.

Usually, kidney function worsens over a number of years. If kidney disease is found early, management and lifestyle modifications will help you to feel your best for as long as possible.

Sometimes though, the kidneys continue to get worse and this leads to end stage kidney disease, which requires dialysis (where a machine filters your blood for you), or a kidney transplant to keep you alive.



How do I know if I have kidney disease?

Unfortunately kidney disease may show no symptoms until you have lost up to 90 percent of your kidney function. Kidney function can be measured by three simple tests called a 'Kidney Health Check'.

1. A **blood test** to measure your eGFR (estimated glomerular filtration rate). This is a measurement that shows how well your kidneys are filtering your blood. It is the best overall measure of kidney function.

If your eGFR is low your kidneys are not working properly. A normal eGFR is usually above 90, although this decreases as you get older.

If you have an eGFR that is lower than 60 for more than three months it means that you have CKD. It also means that you only have about 60 percent kidney function.

2. A **urine test** to see how much albumin (a type of protein) is present in your urine. Healthy kidneys don't let protein leak into your urine.

3. A **blood pressure check**. High blood pressure can damage your kidneys.

People with risk factors for CKD should have a Kidney Health Check at least every two years.

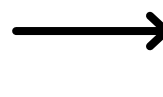
If you have diabetes or high blood pressure, you need a Kidney Health Check every year.



Urine tests



Blood tests



Blood pressure test

What is cardiovascular disease?

Cardiovascular disease includes all diseases and conditions of the heart and blood vessels, such as arteries and veins. Heart failure, heart attack, abnormal heart rhythms, heart valve problems and stroke are all part of cardiovascular disease. Cardiovascular disease is a major cause of death in Australia, and kills one Australian every 12 minutes.

People at every stage of CKD are at increased risk of cardiovascular disease. **People with CKD are up to 20 times more likely to die from a heart attack or stroke than they are to receive dialysis.**

Cardiovascular disease remains the leading cause of death for people on dialysis and who have a kidney transplant.

Why does CKD increase my risk of cardiovascular disease?

There are many reasons why CKD can lead to cardiovascular disease. If you have advanced CKD, your body may be unable to control levels of important minerals, such as potassium and sodium (salt) which can lead to changes in your heart rhythm and increase your blood pressure.

CKD often causes anaemia, which is a medical term for a low number of red blood cells in your blood. When there are less red blood cells to carry the oxygen around your body, your heart has to work harder to get the oxygen to where it is needed.

This can lead to heart failure or increase your risk of stroke.

High blood pressure is one of the major risk factors for CKD.

A high blood pressure puts a strain on your heart and on all of your blood vessels, including your kidneys. It is quite common for people with CKD to have an increased blood pressure.

See the 'Blood Pressure and Chronic Kidney Disease' fact sheet for more information on high blood pressure and how to reduce your risk.

What is diabetes?

Diabetes is a condition where the amount of sugar in your blood is too high. Having high levels of sugar in your blood can damage your organs including your heart and your kidneys.

Normally, when you eat, your body makes a hormone called insulin that helps the sugar move from your blood into your body's cells where it is used as energy. If you have diabetes, the pancreas does not make enough insulin, or the insulin that is made is not used properly by your body. This leads to the levels of sugar in your blood staying high.

There are three types of diabetes:

Type 1 diabetes – (sometimes called juvenile diabetes). Your pancreas stops making insulin, and daily insulin injections are needed to stay alive. Type 1 diabetes is usually diagnosed in childhood. People with Type 1 diabetes will have the condition for life. About 10 to 15 percent of all cases of diabetes are Type 1.

Type 2 diabetes – your pancreas does not make enough insulin, or your body cannot use the insulin properly. This is the most common form of diabetes, accounting for 85 to 90 percent of all cases.

Type 2 diabetes usually affects older adults, but is becoming more common in younger people, even children.

If you have Type 2 diabetes, you will usually be able to manage your condition by making lifestyle changes or taking oral medications (tablets). As the condition gets worse, you may need insulin injections.

Gestational diabetes – a type of diabetes that develops only during pregnancy. Gestational diabetes can increase your risk of developing Type 2 diabetes later in life.



How does diabetes increase my risk of kidney disease?

When people have diabetes, the high levels of sugar in their blood can damage the kidney filters (nephrons), which can then lead to CKD. This is sometimes called 'diabetic nephropathy'.

About one in three of all people with diabetes develop CKD. If you have both CKD and diabetes, you are also more likely to develop other complications of diabetes such as nerve damage and eye damage.

Diabetes is the most common reason that people with CKD need to have dialysis or a kidney transplant. As well as damaging your kidneys, diabetes can damage the nerves in other parts of the body. When your bladder is affected, it may be difficult for you to pass urine (wee). If urine builds up in your bladder, the pressure can make it flow back into your kidneys causing scarring and damage.













When your gut is affected it can lead to feelings of nausea and vomiting and this increases your risk of dehydration (not enough fluids) and kidney damage.

Diabetes can also cause your urine to have a high sugar content. This encourages growth of bacteria (germs) and can cause kidney infections.

See the 'Diabetic Kidney Disease' fact sheet for more information.

Risk factors for CKD, Diabetes and Cardiovascular Disease

CKD, diabetes and cardiovascular disease share many of the same risk factors. If you have any of these risk factors, you should see your doctor and ask for a check-up that includes a Kidney Health Check, Heart Health Check and Diabetes Check.

Risk Factor	CKD	Diabetes	Cardiovascular Disease
 High blood pressure	✓	✓	✓
 Diabetes	✓	✓	✓
 Smoking	✓	✓	✓
 Overweight or obese (Body Mass Index BMI \geq over 30 kg/m ²)	✓	✓	✓
 Aboriginal or Torres Strait Islander background	✓	✓	✓
60+ Older age	✓	✓	✓
 Cardiovascular disease or family history of cardiovascular disease	✓		✓
 Family history of kidney failure	✓	✓	
 Acute Kidney injury	✓		
 Family history of high blood pressure or diabetes		✓	
 Gestational Diabetes		✓	
 Male			✓
 Depression and social isolation			✓

How can I reduce my risk of CKD, Diabetes and Cardiovascular Disease?

There are a number of lifestyle choices that will reduce your risk of CKD, cardiovascular disease and diabetes:

- **Eat a healthy diet** including vegetables, fruits, wholegrain cereals, lean meats, nuts and seeds, and low fat dairy products. See our 'Nutrition and Kidney Disease' fact sheet for more information.
- If you are thirsty, **drink water**. See our 'Drink Water Instead' fact sheet for more information.
- **Reduce your salt and sugar intake**. See our 'Salt and Your Kidneys' and 'Sugar and Your Kidney's Fact sheets for more information.

You can also talk to your doctor about lifestyle changes that you can make to reduce your risk of CKD, cardiovascular disease and diabetes.

- **Be active**. Try to do 2 to 5 hours of moderate intensity physical activity each week. Brisk walking, bike riding, swimming, dancing, social tennis, golf, and household tasks like cleaning and gardening are all moderate-intensity activities.
- Achieve and maintain a **healthy body weight**. Your doctor or an Accredited Practising Dietitian can help if you are having problems with your weight.
- **Limit your alcohol** intake to no more than two standard drinks per day.
- **Be a non-smoker** (for more information on quitting, call the Quit Line on 13 78 48).



THINGS TO REMEMBER

- Kidney disease, cardiovascular disease and diabetes are all connected conditions
- There are key lifestyle changes that you can make to reduce your risk of developing these conditions
- If you have any risk factors, you should have a check-up that includes a Kidney Health Check every 1 - 2 years

What does that word mean?

Acute kidney injury: a loss of kidney function that happens quickly which may or may not be permanent.

Anaemia: when there are only a small number of red blood cells in your blood or your blood cells are not working properly. Red blood cells carry oxygen, so if you have anaemia you can feel weak, tired and short of breath.

Bladder: a muscular, elastic sac inside the body that stores the urine (wee).

Blood pressure: the pressure of the blood in the arteries as it is pumped around the body by the heart.

End Stage Kidney (Renal) Disease (ESKD): the stage of kidney disease when your kidneys have stopped working and treatment, such as dialysis or a transplant, is needed to sustain life. Also referred to as End Stage Kidney (Renal) Failure (ESKF), kidney failure or stage 5 CKD.

Heart attack: occurs when there is a sudden blockage of an artery that supplies blood to your heart.

Heart failure: a condition where your heart muscle doesn't pump blood as well as it should.

Hormone: a chemical made by glands in the body. Hormones circulate in the bloodstream and control the actions of certain cells or organs.

Insulin: a hormone made by our pancreas. Insulin moves glucose (sugar) from our bloodstream into our body cells which is then used as energy. Diabetes means the body does not make insulin (Type 1) or does not make enough insulin, or the insulin it does make does not work well (Type 2).

Kidney transplant: a treatment for end stage kidney disease where a kidney is removed from the body of one person (the donor) and put into the body of the person with end stage kidney disease.

Pancreas: an organ in your stomach that helps break down your food and makes insulin.

Protein: substance obtained from food, which builds, repairs and maintains body tissues. It also helps to fight infections and heal wounds.

Red blood cells: the most common cells found in your blood, containing haemoglobin which helps to carry oxygen around your body.

Stroke: When blood supply to the brain is interrupted. When brain cells do not get enough blood supply, they die. A stroke is a life threatening emergency.

Vein: a blood vessel that returns blood to your heart. End Stage Kidney (Renal)

For more information about kidney or urinary health, please contact our free call Kidney Helpline on 1800 454 363.

Or visit our website kidney.org.au to access free health literature.

This is intended as a general introduction to this topic and is not meant to substitute for your doctor's or Health Professional's advice. All care is taken to ensure that the information is relevant to the reader and applicable to each state in Australia. It should be noted that Kidney Health Australia recognises that each person's experience is individual and that variations do occur in treatment and management due to personal circumstances, the health professional and the state one lives in. Should you require further information always consult your doctor or health professional.

The development of this fact sheet has kindly been supported by Boehringer Ingelheim & Lilly.



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For all types of services ask for 1800 454 363