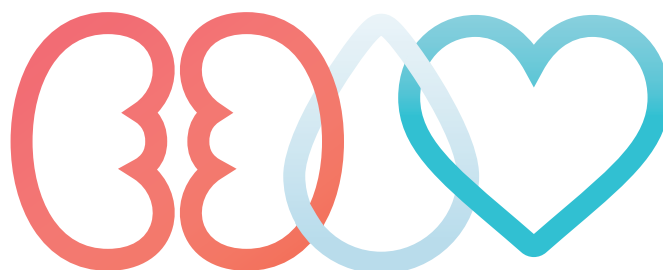


# Make the Link: Chronic Kidney Disease, Diabetes and Cardiovascular Disease

**Chronic kidney disease (CKD), diabetes and cardiovascular disease are harmful chronic diseases that often occur together. These three conditions share common 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).

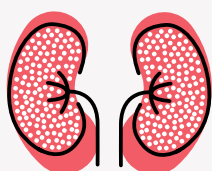
The filtered blood with waste products removed then continues on its journey through your body.

Most kidney diseases attack the nephrons and stop them from doing their job properly.

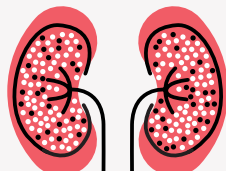
Usually, kidney function worsens over a number of years. If kidney disease is found early, management and lifestyle changes will help you to feel your best for as long as possible.

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

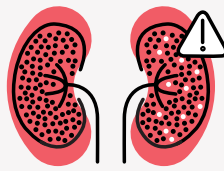
## Kidney disease:



Healthy kidney



Kidney disease



Kidney failure

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

## 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 pressure check.** High blood pressure can damage your kidneys.

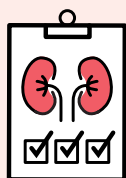
**2. A urine test** to see how much albumin (a type of protein) is present in your urine. Healthy kidneys don't let protein leak into your urine.

**3. A blood test** to determine your eGFR (estimated glomerular filtration rate).

This is a measurement that shows how well your kidneys are filtering your blood. Your eGFR roughly equates to the percentage of kidney function you have left. So an eGFR of 60 means your kidneys are functioning at about 60%.

### Kidney Health Check

People at increased risk of CKD should have a Kidney Health Check every one to two years. If you have diabetes or high blood pressure, you need a Kidney Health Check every year.



#### Blood pressure check



+

#### Urine tests



+

#### Blood tests



## What is cardiovascular disease?

Cardiovascular disease includes all diseases and conditions of the heart and blood vessels. Heart failure, heart attack and stroke are all part of cardiovascular disease.

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 and both reduced eGFR and protein in your urine are independent risk factors for developing 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.

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

High blood pressure puts 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. The target blood pressure for people with CKD is 130/80mmHg.

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

## 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 kidney disease'.**

**About half of all the people with diabetes will 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 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.



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

## 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.

Chronic kidney disease, diabetes and cardiovascular disease together affect **29% of Australian adults** and frequently occur together.



Risk factor	CKD	Diabetes	Cardiovascular Disease
 High blood pressure	✓	✓	✓
 Diabetes	✓	✓	✓
 Smoking and vaping	✓	✓	✓
 Overweight or obese (Body Mass Index BMI $\geq$ over 30 kg/m <sup>2</sup> )	✓	✓	✓
 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			✓

It is also recommended that people aged over 60 years or First Nations peoples aged over 18 years have their kidneys, heart and diabetes risk checked as part of their annual health check-up.

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

## 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** This includes vegetables, fruits, wholegrain cereals, lean meats, nuts and seeds, and low-fat dairy products.
- If you are thirsty, **drink water**. Water is the best choice for healthy kidneys. You should avoid high calorie sugar-sweetened beverages (like soft-drinks) and 'diet' drinks that are high in sodium (salt) at all costs.
- **Reduce your salt and sugar intake.**
  - Reduce the amount of salt you eat to less than 5g per day. Less salt helps to keep blood pressure under control. A healthy blood pressure is important for all people with CKD, diabetes, and cardiovascular disease.
  - Avoid added sugar and highly processed foods. This is important for the health of your kidneys and for managing the amount of sugar in your blood.
- **Keep active.** Try to be active for 30 minutes on most days. Things like brisk walking, bike riding, swimming, dancing, social tennis, golf, and household tasks like cleaning and gardening are great options to keep you healthy.
- 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 how much alcohol you drink.** Aim for no more than two standard drinks per day.
- **Say no to smoking and vaping.** Stopping smoking and vaping is particularly important for your kidney health. If you smoke, call the Quit Line on 13 78 48.



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



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



## Things to remember:

- ✓ **Chronic 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.

**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.

**Cardiovascular disease** – Includes all disease and condition of the heart and blood vessels, such as arteries and veins. The most common conditions include heart attack, heart failure, stroke, blockages in the blood vessels and vascular kidney disease.

**Diabetic kidney disease** – A serious outcome of diabetes, which affects the kidney filters and can lead to kidney failure. Also called diabetic nephropathy.

**Kidney failure** – the stage of kidney disease when your kidneys have stopped working and treatment, such as dialysis or a transplant, is needed to sustain life.

**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 makes does not work well (Type 2).

**Kidney transplant** – a treatment for kidney failure where a kidney is removed from the body of one person (the donor) and put into the body of the person with kidney failure.

**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.



## For more information

To access more information about CKD or kidney health, please scan the QR code.

**Free Kidney Helpline 1800 454 363**  
[kidney.org.au](http://kidney.org.au)



If you have a hearing or speech impairment, contact the National Relay Service on **1800 555 677** or [relayservice.com.au](http://relayservice.com.au)  
For all types of services ask for **1800 454 363**

This educational resource is supported by a sponsorship provided by Boehringer Ingelheim and Eli Lilly Alliance.

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.