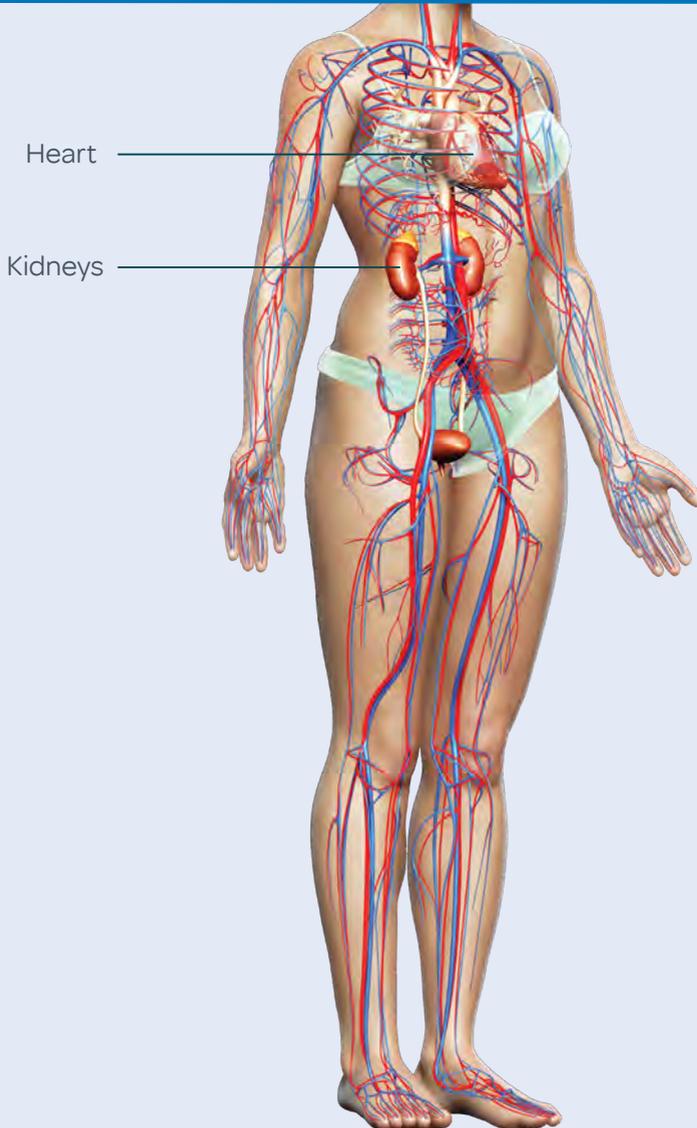


Kidneys and heart disease



Working together for better patient information

Your body contains a complex network of blood vessels that carry blood between your organs. Arteries carry blood from your heart to the rest of your body and veins carry blood from your body back to your heart. This network of blood vessels is called your circulatory system. Your heart is the centre of this system. If your heart doesn't work as well as it should, it can affect your other organs. This leaflet explains how heart disease can affect the kidneys.



What does your heart do?

Your heart is a muscle and it has the vital job of pumping blood around your body. Blood provides oxygen and other important nutrients to your organs. All of your organs need a continuous supply of oxygen and nutrients to stay healthy. The heart also pumps blood which has carbon dioxide. This is the waste products from your organs and is removed in the lungs.

How does my heart work normally?

Your heart is divided into four chambers, with two on each side of your body. The right side of your heart pumps blood into your lungs where it picks up oxygen and the left side receives this oxygen-rich blood from your lungs and pumps it to your organs.

Your heart has to pump enough blood through your circulatory system all the time. It does this by:

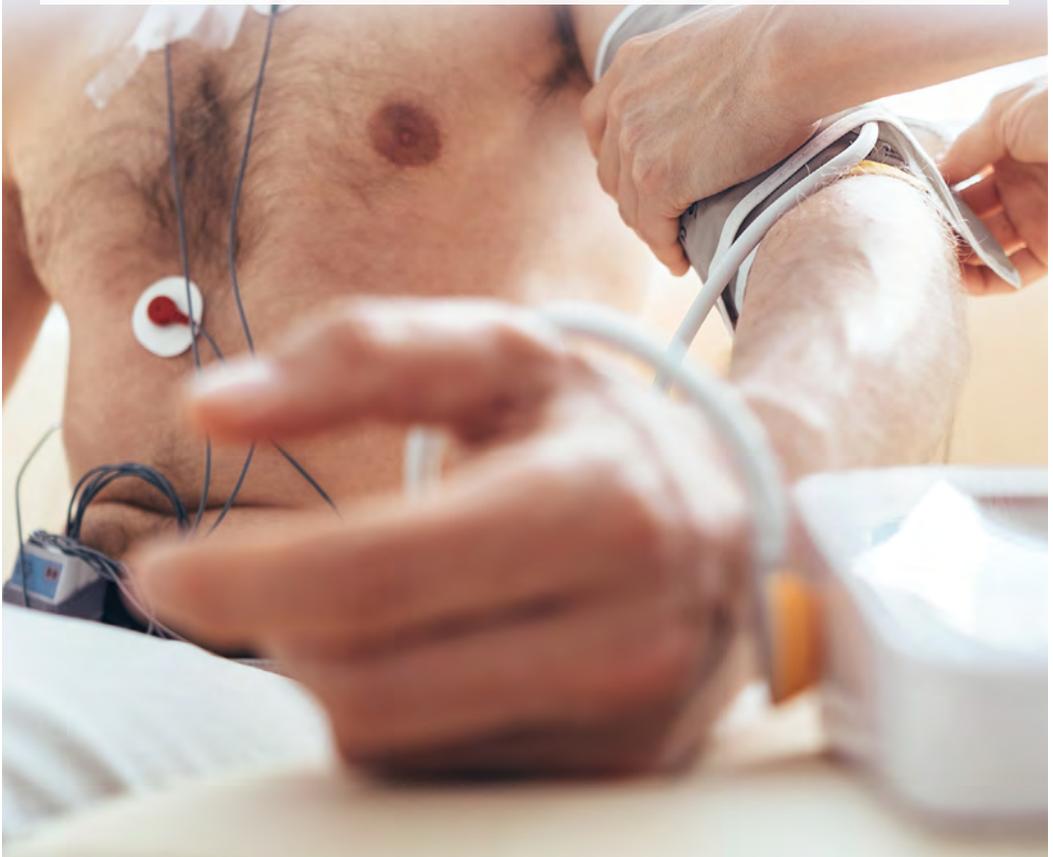
- 1.** Keeping your heartbeat regular through an electrical system within the heart which controls the timing of the pump
- 2.** Keeping your heart muscle pumping by squeezing blood and relaxing between heartbeats
- 3.** Keeping blood flowing through the heart through special valves which control the flow in and out of the chambers of the heart.

As the blood moves, it pushes against the sides of your blood vessels. The force of this pushing is called **blood pressure**, and this is used as a measure of how healthy your heart is.

What is heart disease?

Heart disease describes a long-term problem with your heart. This can include:

- Problems with the heart's electrical system. This can lead to an **arrhythmia** where the heart chambers beat too fast, too slow or in an uncoordinated way
- Problems with the heart's pump. The most common cause of this is when the muscle does not contract properly due to lack of blood supply to the heart. This is called **ischaemia** and is usually caused by atherosclerosis or furring of the arteries.
- Problems with the heart valves. This disrupts the normal flow of the blood.



How can heart disease affect your kidneys?

As your heart and kidneys are interconnected, if your heart is not working well, this can also affect your kidneys. If your heart pump is not working properly, your kidneys will receive less oxygen. Your kidneys need lots of oxygen to function normally and if this is reduced, your kidney function will get worse over time.

How can kidney disease affect your heart?

- Kidney disease can lead to an increased risk of high blood pressure, which can damage the blood vessels in the heart.
- Changes in cholesterol levels in some kidney conditions can also damage the heart.
- Increased fluid retention can increase the pressure on the heart.
- Medications for treating some kidney conditions, such as steroid therapy, increases the chance of having heart disease.

As the relationship between your heart and kidneys is so important, your doctor may check your heart if you have a kidney condition, and your kidneys if you have a heart condition.



What increases the chance of having heart disease?

There are lots of factors that can increase your risk of developing heart disease, including:

- Age – older people are more at risk of heart disease, although it can affect people of all ages
- Sex – men are more likely to develop heart disease earlier than women
- Smoking - nicotine narrows your blood vessels, increasing your blood pressure and making the heart work harder to pump enough blood around your body.
- Menopause – the chance of heart disease increases after menopause
- High blood pressure which is not treated
- Family history of heart disease
- Poor diet – this can lead to high levels of cholesterol, a fatty substance in the blood that increases the risk of developing a blood clot by sticking to the walls of your arteries and narrowing the blood flow
- Diabetes
- Sedate lifestyle without exercise



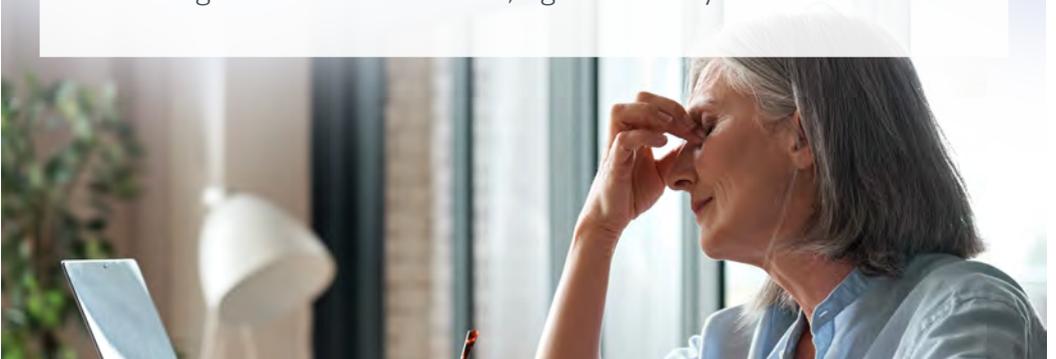
What are the symptoms of heart disease?

The symptoms of heart disease can vary depending on the underlying cause. They can develop very quickly over just a few days or more slowly over several weeks or months.

Many of the symptoms of heart disease can also be caused by other conditions and may not be serious. However, you should always talk to your doctor if you are concerned, especially if the symptoms develop quickly.

Symptoms include:

- Chest pain. This is traditionally described as in the centre of the chest, radiating down the left arm or up to the neck. It can come on suddenly or can be noticed when you are trying to walk, climb stairs or exercise.
You should seek immediate medical help if you have chest pain. The pain may vary and can be felt differently by men and women and in people with diabetes.
- Breathlessness. This may also be worse when exercising but may occur even when you are resting
- Changes in the heart rate so it feels fast, slow or fluttering (irregular)
- Feeling more tired than usual
- Feeling very weak
- Frequent coughing with white or pink phlegm (also known as mucus)
- Retaining fluid with swollen ankles, legs and tummy



How is heart disease diagnosed?

Your doctor may do some tests to see how your heart is working.

These may include:

- Blood tests – your doctor will be able to see from these tests whether your blood shows anything that might suggest you have heart failure such as high cholesterol levels
- An electrocardiogram (ECG) – patches stuck onto your skin record your heart's rhythm and electrical activity.
- An echocardiogram – this is a type of ultrasound where sound waves are used to check your heart's structure and function.
- An X-ray – this is a test that uses radiation passed through your body to produce a picture of your heart

How is heart disease treated?

If the tests show that you might have heart disease, you will be sent to see a specialist heart (cardiac) team. Although the damage to your heart may not be able to be repaired, there are a variety of treatments that can help to manage your symptoms.

Lifestyle changes

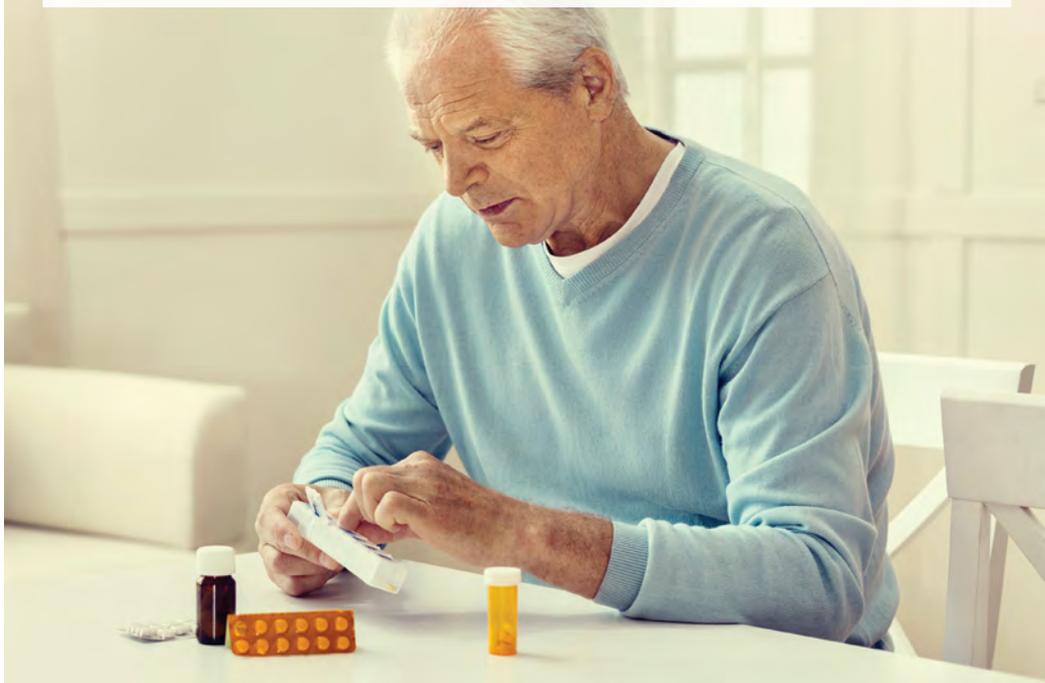
Stopping smoking, reducing how much alcohol you drink, eating a healthy diet and doing regular exercise can help both your heart and kidneys. These changes can help with your symptoms and reduce the risk of your heart disease getting worse.

Medicines

You may be prescribed several different medicines including:

- Angiotensin-converting enzyme (ACE) inhibitors to help relax and open your blood vessels and reduce your blood pressure
- Angiotensin receptor blockers (ARBs) to help relax blood vessels and bring down your blood pressure
- Mineralocorticoid receptor antagonists (MRAs) to help you pass more urine, lower your blood pressure and reduce some of the fluid around your heart
- Diuretics (water tablets) to help you pass more urine and reduce ankle swelling and breathlessness
- Beta blockers which regulate the heartbeat and helps to ensure that the heart rate is not too fast. This helps reduce the work of the heart.

You will need regular blood tests while taking these medicines.



If you have severe heart disease your doctor may discuss further treatment options. These may include:

Coronary angiograms

This is a special test that will look at the blood supply to the heart to see if there are any blood vessels that can be treated. The doctor may be able to treat this at the time with a special procedure called **angioplasty** where the narrowing of the artery is treated and they may be put a covering on it to try and stop this occurring again (a stent).

Device implants

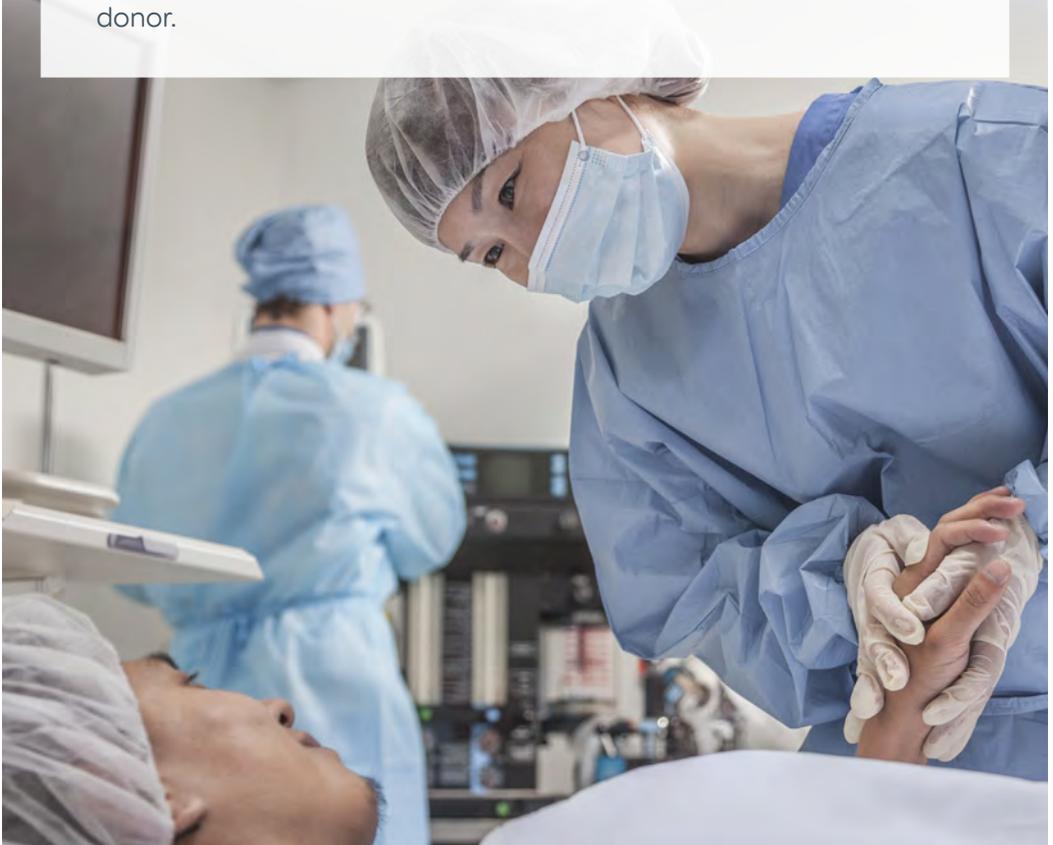
If you have an abnormal heart beat a cardiologist (specialist heart doctor) may suggest that you have a small device placed in your chest to help your heart's rhythm. There are different types of devices which can help to improve the way the electrical current works in the heart.



Surgery

Although heart disease is usually treated with medicines, in severe cases surgery may be needed. Possible operations include:

- Heart valve surgery which can either replace or fix damaged heart valves to improve symptoms
- Coronary artery bypass graft/angioplasty which can help clear blocked arteries and help your heart to pump normally
- Implantation of left ventricular assist devices, which are mechanical pumps that can help the chambers in your heart to pump more effectively
- Heart transplant. This is rarely an option for most people with heart disease. It involves replacing your heart with a healthy heart from a donor.



Where can I find out more information?

- Kidney Care UK - Patient information - www.kidneycareuk.org
- NHS website: Cardiovascular disease - www.nhs.uk/conditions/Cardiovascular-disease



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