When you might need one

Pacemaker

You may need to have a pacemaker fitted if your heart beats abnormally. This usually means too slowly.

If your heartbeat is abnormal, a pacemaker can greatly improve your quality of life. It can be lifesaving for some people.

Having a pacemaker fitted is one of the most common types of heart surgery.

How a pacemaker works

A pacemaker monitors your heart rate. It then sends electrical pulses to your heart to keep it beating regularly and at the right speed.

The pacemaker is put under the skin by a cardiologist. It's a small device about the size of a matchbox. It weighs 20g to 50g.

It has a pulse generator that has:

- a battery
- a tiny computer circuit
- 1 or more wires known as pacing leads - these attach to your heart

The pulse generator emits electrical impulses to your heart. The rate at which the electrical impulses travel is called the pacing rate.

Almost all modern pacemakers work on demand. This means they can adjust the discharge rate as your body needs.

If the pacemaker senses that your heart has missed a beat or is beating too slowly, it sends signals at

a steady rate.

If it senses that your heart is beating normally by itself, it does not send any signals.

Most pacemakers have a sensor that recognises your body movement or breathing rate. This means the pacemaker can speed up the discharge rate when you're active. Doctors describe this as rate responsive.

Pacemakers need to be checked regularly by specialists at a pacemaker clinic.

Why you might need a pacemaker

The heart is basically a pump made of muscle and controlled by electrical impulses.

If these impulses are disrupted, this can lead to dangerous heart conditions. These conditions can cause an abnormal heartbeat.

If this happens, you'll need a pacemaker or implantable cardioverter defibrillator (ICD).

An abnormal heartbeat is called an arrhythmia.

The most common causes of arrhythmias are:

- sick sinus syndrome
- atrial fibrillation
- heart block
- cardiac arrest

Sick sinus syndrome

This is when a group of specialised cells in the heart known as the sinoatrial node (SA node) do not work as they should.

This can cause:

- an abnormally slow heartbeat (bradycardia)
- an abnormally fast heartbeat (tachycardia)
- a combination of both

Symptoms of sick sinus syndrome can include:

- a slower pulse than normal (bradycardia)
- extreme tiredness (fatigue)
- fainting or nearly fainting, dizziness or light-headedness
- shortness of breath
- chest pain
- irregular or fluttering heartbeats (palpitations)

Most cases of sick sinus syndrome are related to age. Over time, the SA node tissue can become

hardened and scarred. This can disrupt the normal pattern of electrical pulses released by the SA node.

Some types of medicines can also trigger sick sinus syndrome as a side effect. These include calcium channel blockers and beta-blockers.

Atrial fibrillation

Atrial fibrillation causes the heart to beat abnormally fast. This is usually much higher than 100 beats a minute (often 140 beats a minute or more).

You can treat it with medicines. But if your condition does not improve after treatment, you may need a pacemaker.

Sometimes people with atrial fibrillation can have a much slower pulse rate. In these cases, you may also need a pacemaker.

Heart block

Heart block is when impulses in the heart are either delayed or absent. This can happen when the heart is damaged or it can happen at birth.

If you have heart block that's causing certain symptoms you'll usually need a pacemaker.

Cardiac arrest

A cardiac arrest is condition that can kill you. It happens when the electrical activity that controls the heart is so disrupted that the heart stops beating. If it is not treated quickly, you will die.

Factors that increase the risk of a cardiac arrest include:

- coronary heart disease
- having a heart attack
- congenital heart disease
- cardiomyopathy – this is poor heart function due to abnormalities of the heart muscle

An implantable cardioverter defibrillator (ICD) is mainly used to prevent cardiac arrest. An ICD is a device similar to a pacemaker.

Implantable cardioverter defibrillators (ICDs)

An ICD can detect abnormal electrical signals. These can indicate that a cardiac arrest is about to happen. If the ICD detects this type of signals, it sends a powerful electrical shock to the heart.

This 'reboots' the heart. After the shock, the heart should start beating normally again.

You may need an ICD fitted if you have:

- had a cardiac arrest in the past
- a high risk of having a cardiac arrest in the future

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