

A Guide to Pacemakers, ICDs and CRT-Ds

Your heart has its own electrical system that controls how fast and how regularly it beats. Sometimes this electrical system does not work properly, causing the heart to beat too slowly, too quickly, or out of sync. This can lead to symptoms such as dizziness, fainting, fatigue, breathlessness or, in some cases, life-threatening heart rhythm problems.

Implantable heart devices can help manage these conditions, improve symptoms and, for some people, reduce the risk of sudden cardiac death.

What is a Pacemaker?

A pacemaker is a small electronic device that helps your heartbeat at a normal rate if it is beating too slowly.

The pacemaker constantly monitors your heartbeat. If your heart rate slows below a safe level, it sends tiny electrical signals to stimulate the heart to beat. Most people do not feel these signals.

A pacemaker **does not replace your heart**—it simply helps your heart's own electrical system work properly.

A pacemaker may be recommended if you have:

- A slow heart rate (bradycardia)
- Heart block (when electrical signals cannot travel normally through the heart)
- Symptoms caused by a slow heartbeat, including:
 - Dizziness
 - Fainting
 - Fatigue
 - Reduced exercise tolerance

What is an Implantable Cardioverter Defibrillator (ICD)?

An Implantable Cardioverter Defibrillator (ICD) is designed to protect you from dangerous fast heart rhythms that can cause sudden cardiac arrest.

The ICD continuously monitors your heart rhythm. If it detects a life-threatening rhythm, it can respond in one of two ways:

- Deliver painless rapid pacing to restore a normal rhythm, or
- Deliver an electrical shock to reset the heart.

The shock can be uncomfortable, but it is delivered only when needed and can be life-saving.

An ICD may be recommended if you:

- Have previously experienced dangerous heart rhythm disturbances
- Have survived a cardiac arrest
- Have certain inherited heart conditions
- Have a weakened heart muscle that places you at increased risk of life-threatening heart rhythms

What is a CRT/CRT-D?

CRT stands for **Cardiac Resynchronisation Therapy**.

A CRT-D combines the functions of a pacemaker and an ICD.

In some people with heart failure, the right and left sides of the heart do not beat together efficiently. This reduces the heart's ability to pump blood around the body.

A CRT-D sends carefully timed electrical signals to both sides of the heart so they beat in a more coordinated way. This can improve the heart's pumping ability while also protecting against dangerous heart rhythms.

A CRT/CRT-D may help:

- Improve symptoms of heart failure
- Reduce breathlessness and fatigue
- Improve exercise capacity and quality of life
- Reduce hospital admissions for heart failure
- Protect against sudden cardiac arrest

How is the device implanted?

Implantation is a common procedure performed by a cardiologist in a cardiac catheterisation laboratory or operating theatre.

Before the procedure:

- You will usually receive local anaesthetic to numb the area beneath your collarbone.
- Most patients also receive medication through a drip to help them relax. Some patients have a full anaesthetic, but some only have sedation depending on the patient's wish and the advice of the anaesthetist.
- If you are sedated, you may be aware at times but should be comfortable throughout the procedure.

During the procedure:

- A small incision (approximately 4–6 cm) is made below the collarbone.
- One or more thin insulated wires, called **leads**, are guided through a vein into the heart using X-ray imaging.
- The leads are attached to the heart and connected to the device.
- The device is placed under the skin or just beneath the chest muscle.
- The doctor tests the system before closing the incision.

The procedure usually takes:

- **Around 1 hour**

Patients stay in hospital overnight and go home the following day after device checks have taken place.

Living with your device

Most people return to their normal daily activities after recovery.

Modern heart devices are very reliable and designed to work safely with most household appliances and electronics. You should always tell healthcare professionals that you have an implanted heart device before any medical procedures or scans to ensure it is safe to proceed.

Your cardiologist will explain any precautions that apply specifically to your device.