

Patient information from BMJ

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Defibrillator: having a defibrillator fitted

This information tells you about an operation to put a device in your chest that helps your heart beat normally.

It explains how the operation is done, how the device can help you, what the risks are, and what to expect afterwards.

It's your decision whether to have a defibrillator fitted. You can use our information to help you discuss defibrillators with your doctor.

What is a defibrillator?

An **implantable defibrillator** is a device that's put (implanted) in your chest to stop an abnormal heart rhythm, especially one where the lower part of your heart beats too quickly.

You might hear these devices called different things. For example, they're sometimes called **implantable cardiac defibrillators** or **implantable cardioverter defibrillators**. Either way, they're often called **ICDs** for short.

Normal and abnormal heart rates

A **normal heart rate** can be anything from 60 to 100 beats per minute. An **abnormal** heart rhythm can mean that your heart beats at 120 to 200 beats per minute, or even faster. This can make your heart muscle flutter weakly instead of beating strongly.

If this happens, your heart can stop pumping blood around your body. If your heart doesn't start to beat normally again, you will die.

A controlled electric shock can get your heart beating normally again - a bit like pressing a reset button in the heart. You might have seen this in medical dramas on television, with actors using electric paddles to shock someone's heart into beating.

An **ICD** works in the same way as the paddles. It shocks your heart into beating steadily again if it starts to beat too fast.

An ICD is about the size of a pack of cards. It's put under the skin just below your collarbone on the left side of your chest. The device is powered by a battery and has an electric circuit that checks your heartbeat. A lead connects the device to your heart.

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An abnormally fast heartbeat can be caused by several heart conditions. The information here is only about people who have a heart condition called **heart failure**.

Heart failure is when your heart stops pumping properly because it's been damaged. About one third of people with heart failure get a dangerously fast heartbeat. A fast heartbeat increases the chance that someone with heart failure will die suddenly.

Why might I need a defibrillator?

If you have heart failure and an abnormal heart rhythm in the lower part of your heart, an ICD can help you live longer.

Not everyone with heart failure will need an ICD. But your doctor might suggest one if he or she thinks that there is a strong chance that you could die because of your abnormal heart rhythm.

You should be offered an ICD if your heart stopped pumping because of a fast rhythm and had to be restarted. But you should also be offered one if:

- your heart beats too fast for long periods (more than 30 seconds)
- your heart beats faster suddenly and without warning, and
- you have blackouts or other signs that your blood flow is being restricted.

You should also be offered an ICD even if you don't have blackouts and other serious symptoms if:

- your heart beats too fast for long periods, and
- your heart struggles to pump out enough blood each time it beats, even if you don't have very severe heart failure.

If you have very severe heart failure, your heart will be very weak and unable to pump properly. Doctors don't usually recommend ICDs for people with very severe heart failure, as they won't help.

Some people with heart failure have an ICD fitted along with a **pacemaker**. A pacemaker is slightly different to an ICD. The type used in people with heart failure uses an electrical pulse to keep both sides of the heart beating in time with each other.

What will happen?

An operation to put an ICD in your chest usually takes between 45 minutes and an hour. But you'll need to stay in hospital for a few days afterwards.

Before the operation

You'll have some tests before the surgery, including a blood test and an electrocardiogram (ECG). An ECG records the electrical activity of your heart as a tracing on a graph.

Your doctor uses your test results to programme your ICD so that it can spot a heart rhythm that is not normal for you.

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If you take certain blood-thinning drugs for heart problems, you might need to stop taking them a few days before the operation. These drugs increase the chance of excess bleeding during surgery. Check this with your doctor.

If you're a man, you might have to cut or shave your chest hair before the operation.

You'll probably only need a local anaesthetic. This will numb your chest. You'll also be given a drug called a sedative through a vein in the back of your hand to make you calm and sleepy.

You won't see anything or feel any pain during surgery, but you might be aware of what's going on around you. Operating theatres can be noisy, and you might hear the sound of monitors checking your heart rate and blood pressure.

A nurse or the anaesthetist will talk to you to make sure you're OK.

During the operation

During surgery to implant a defibrillator:

- the doctor will make a cut across your chest just below your collarbone. The cut will be about 8 centimetres (3 inches) long
- the ICD lead is threaded down through a vein into the lower right chamber of your heart. Some ICDs have two or more leads. These go into other parts of your heart
- the doctor takes X-rays of your chest to make sure the leads go in the right place
- your doctor then makes a small pocket in the fat underneath the skin of your chest. The ICD is placed in this pocket
- your doctor will then connect the leads to the ICD and test it to make sure it works. The ICD will gently shock your heart, but it shouldn't hurt
- the cut on your skin is usually sewn up with one long stitch that dissolves later. You might have a dressing over the wound.

You shouldn't feel any pain during the operation. Your cut may feel sore afterwards, but you'll be given painkillers to help. If your painkillers don't work, you should tell the nurse or doctor. You might be able to have a higher dose or a different painkiller.

How will the defibrillator work after the operation?

An ICD will only shock your heart if your heartbeat gets dangerously fast.

This shouldn't happen often. Most people with defibrillators are shocked perhaps once every year or two. Some people can have a defibrillator for several years without it needing to shock their heart.

But if your defibrillator does need to shock you it can be very painful. It feels like a big thump in your chest, and you might stumble.

If anyone is touching you when the shock happens it won't harm them, but they might feel a tingle.

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Some people say that they feel afraid and upset after a shock. Others say that they feel relieved that the ICD saved their life.

After each shock you need to go to hospital to have your ICD checked and reset.

What are the risks?

All operations have risks, and your doctor should discuss with you the risks of surgery to put in an ICD.

For example, anaesthetics can have side effects, although these are more likely with a general anaesthetic. Some people have an allergic reaction to the anaesthetic or have breathing or heart problems while under anaesthetic.

These problems are rare but serious when they do happen. If you have any allergies, you must tell your doctor before the surgery.

The list of possible problems below might look long and scary. But remember, these are problems that might happen, not things that will definitely happen. Many people have no problems at all.

The main **problems that can happen with ICD**surgery are:

- bleeding under the cut in your skin after the operation. If the blood builds up and clots, it causes a large bruise called a **haematoma**. The area will be swollen and feel tender. You might need surgery to remove the blood clot or to stop any bleeding
- an infection around the wound. This can make your wound and the surrounding skin painful, hot, and red. You'll need to take antibiotics, and some people need to have their ICD removed. But you can have another ICD fitted when the infection clears up
- an infection that spreads to the heart. This is called **endocarditis** and it can be very serious. You'll need treatment with antibiotics
- a lung puncture during the operation. If this happens, air can leak out of your lungs and get trapped inside your chest. It can cause breathlessness and pain. You might need to have a chest tube inserted to release the air
- bruising on your chest. This can take a while to clear up
- damage to the vein used to pass the leads into your heart. If this happens it will need to be repaired
- dying during surgery. This happens to less than 1 in 100 people who have this operation.

Even if your operation goes well, problems can happen with the ICD. Your doctor should discuss these with you before the surgery.

Problems that can happen with an ICD include:

- the leads breaking or slipping out of place. You might need a small operation to move or replace the leads. Sometimes the ICD can slip out of place

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- ICDs sometimes not working properly, usually because of problems with the battery. Your doctor should regularly check your ICD once it's fitted. Problems like this are becoming less common as newer ICDs become more reliable
- your ICD shocking your heart even though it's not beating dangerously. This can happen if the ICD mistakes a harmless heart rhythm for a dangerous one. Or it could be that the ICD is faulty or is set off accidentally by electrical equipment. As with battery errors, these problems are becoming less common
- security systems that use a magnetic force interfering with or even damaging your ICD. And you can set the alarm off at airports and in shops
- finding an ICD hard to live with, especially if shocks happen several times a year. The shocks can save your life, but they are also upsetting. Shocks can cause anxiety and depression in some people. Joining a support group for people with ICDs can help.

What can I expect afterwards?

Immediately after the operation

When you leave the operating theatre, you'll go to the recovery area until you're fully awake. The area of your chest where the cut was made will feel numb for several hours.

You'll probably feel sleepy at first, but you'll be able to get up and walk around as soon as the sedative has worn off. Your ICD will be checked again before you leave hospital.

Going home

You should be able to go home the day after your surgery. When you get home you're likely to feel more tired than usual for a day or two.

Your chest might feel sore for a few days and it might look bruised and swollen. Painkillers can help. It's a good idea to wear a loose top that doesn't rub your wound.

Your doctor or nurse will explain when and how to remove any dressings over your cut. You'll also get advice on when you can go back to work.

It's best to avoid moving your shoulder and arm too much for a few days, and you should avoid lifting anything heavy. You'll probably need a week or two to recover fully.

You might be able to feel the ICD under your skin. This can feel strange at first, but most people quickly get used to it.

It can be harder to get used to the idea that a machine in your body can shock your heart. Some people feel vulnerable and worry that the ICD might not work. But other people feel reassured knowing that the ICD could save their life.

Ask at your hospital if there's a support group in your area for people with heart failure or ICDs.

Some hospitals give people a card with technical information about their ICD. It is important that you carry this with you when you go out in case you need medical treatment in an emergency.

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An ICD can't stop your heart failure from getting worse. Some people have their ICD taken out when they become very ill because they don't want it to restart their weak heart.

My ICD and everyday life

There are some areas of your life that will be affected by your ICD.

Driving

If you drive, you'll need to tell the driving authorities where you live that you have an ICD. For example, in the UK it's the Driver and Vehicle Licensing Agency (DVLA). You'll also need to tell your insurance company.

The rules about driving vary from country to country and you should check the rules where you live. But the rules in the UK are typical of those in many countries. In the UK:

- if you've had a fast heart beat before, then you won't be able to drive for six months after your ICD is fitted
- after this, you can drive only if your ICD has not shocked your heart for six months and your doctor regularly checks that your ICD still works
- you must stop driving for a month if your doctor reprograms your ICD.

Security systems

Security systems such as metal detectors at airports can trigger your ICD. It's safe to go through them, but don't linger. It's best to tell security staff that you have an ICD before you go through, as the security system will detect it.

Electrical equipment

Electrical equipment with magnets can affect your ICD. Large music systems and power generators contain magnets. Talk to your doctor about what to avoid.

Household appliances such as televisions, washing machines, microwaves, radios, and electric blankets **won't** interfere with your ICD.

Other medical treatments

Some medical treatments, such as radiotherapy, can damage your ICD. Whenever you have medical treatment, **tell the doctor** treating you that you have an ICD. The ICD may need to be turned off during some procedures.

You won't be able to have a type of scan called an **MRI**. This uses strong magnets that will damage your ICD.

Flying

You can travel by aeroplane if you have an ICD. But check your travel insurance, as it might not cover your heart failure.

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Activities and hobbies

It's safe to do things that increase your heart rate and make you out of breath. But you need to warm up slowly so that your heart rate has time to adjust. Your hospital should advise you about how much you can do.

You might want to avoid activities that could be dangerous if your ICD shocks your heart, such as cliff walking or swimming alone.

You can have sex as soon as you feel able to. But avoid putting pressure on your arm or chest for the first few weeks.

It's important that you know what to expect from your ICD and understand the risks and benefits of having one. If you have any questions, ask your doctor or nurse.

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