



Having a subcutaneous implantable cardioverter defibrillator (S-ICD) implant

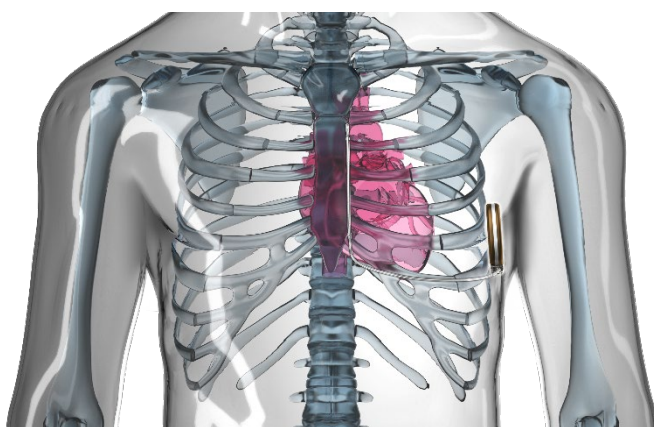
This leaflet explains what having an S-ICD entails and how it may affect your daily life.

What is an S-ICD?

An S-ICD is an electrical device that is implanted on the left side of the chest wall (below the armpit) to monitor and treat dangerously fast heart rhythms. It is larger than a pacemaker and has two main components: the generator and a wire that is known as a lead. The generator contains the battery, capacitors and computer components that make the ICD work. The lead is a special wire that allows the device to monitor the heart rhythm continuously and is inserted just underneath the skin to the side of the breastbone.

Traditional transvenous ICD's are usually implanted below the left collarbone, with the leads inserted via veins directly into the heart. However, the S-ICD lead is implanted just under the skin so does not come into direct contact with the heart. To determine if the S-ICD is suitable for you, you will undergo screening to determine if the heart signals are satisfactory for this type of device. This may be assessed while sitting or lying down, as well as standing, or while exercising on a treadmill.

S-ICD's are not appropriate for people who also need to use the device as a pacemaker.



Subcutaneous ICD (S-ICD), *Image provided courtesy of Boston Scientific.*
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Why do I need an S-ICD?

You have had or are at greater risk of having an abnormally fast heart rhythm, which could be dangerous. This could result in you experiencing symptoms such as palpitations, dizziness or in serious cases, a cardiac arrest (heart attack). A cardiac arrest is when an abnormally rapid heart

rhythm such as ventricular tachycardia (VT) or ventricular fibrillation (VF) prevents the heart from being able to pump blood around the body in an effective manner. An S-ICD will continuously monitor the heart rhythm and deliver therapy to correct the arrhythmia as required. Common conditions that may require the implantation of an ICD are:

- Ischaemic cardiomyopathy (heart muscle damage after a heart attack).
- Dilated cardiomyopathy (abnormally stretched heart muscle, a condition which may be hereditary or have other causes)
- Hypertrophic cardiomyopathy (abnormally thickened heart muscle, a condition which may be hereditary).
- Brugada syndrome (affects the way the electrical signals travel through the heart, a condition which may be hereditary).
- Long QT syndrome (affects the way the electrical signals travel through the heart, a condition which may be hereditary).
- Arrhythmogenic ventricular cardiomyopathy (AVC), where muscle cells may be replaced with fatty and fibrous scar tissue, a condition which may be hereditary.
- Idiopathic cardiomyopathy (the cause or mechanism is unknown).

How does an S-ICD work?

The S-ICD continuously monitors the heart rhythm and will be able to treat an arrhythmia by delivering one or more shocks to restore the heart to a normal rhythm.

What are the risks and benefits?

The main benefit is the lifesaving protection against dangerously fast heart rhythms.

Having an S-ICD implanted is usually a safe procedure. Complications from this procedure are rare but may include:

- **Pain:** you will be given local anaesthetic and sedation if you wish. There may be discomfort during the procedure around the area where the incision is made, but if it is painful please speak up and we will give you more medication as necessary.
You are likely to experience continued pain underneath the armpit where the device was implanted for some time afterward, as well as on the chest area where the lead was inserted. You will be advised on appropriate painkillers to manage the pain.
- **Bleeding and bruising around the S-ICD site:** (common).
- **Keloid scar formation:** an enlarged raised scar that can be skin coloured, pink or darker than the surrounding area (*uncommon*).
- **Haematoma:** a large collection of blood at the implantation site. A pressure bandage may be applied to help decrease the haematoma, but it may require drainage in more severe cases (1 in 100).
- **Lead repositioning:** a repeat procedure may be required to reposition or replace a dislodged lead (1 in 100).
- **Infection:** antibiotics are given routinely to prevent infection. Serious infections may require the removal of the device and lead; however most are able to be successfully treated with antibiotics. (1 in 100).

- **Death:** this is extremely rare but could theoretically occur due to a dangerous rhythm occurring at the time of implant from which you cannot be resuscitated (*1 in 1000*).

Before the procedure

- On the day of the procedure, you will be admitted to our cardiac day ward which is known as the 'Jim Shahi Unit' (JSU), located on level 1 in Battle Block. The JSU unit is an emergency unit and there may be unforeseen delays. Please bring some reading material along to occupy you while you wait.
- **Please refrain from eating or drinking for 6 hours prior to the procedure.**
- Most people can continue to take their regular medications. Please refer to the accompanying letter that will contain any specific instructions on this. If you have any concerns regarding your medications, please ring the Jim Shahi Unit (JSU), 0118 322 6502 for clarification.
- It is common to have an MRSA swab prior to the implant, and details about this will be given in your letter.
- If you are pregnant, or think you may be pregnant, you should notify a member of the administration team prior to the procedure.
- Tell one of the nurses if you have any allergies.
- Please be sure to bath or shower prior to your procedure, avoiding any moisturizers or oils to the skin.

During the procedure

- A nurse will undertake some pre-procedure checks, including taking your blood pressure, an electrocardiogram (ECG) to assess your heart rhythm and insert a small tube (cannula) into your arm. The tube is used to give you a one-off dose of antibiotics at the start of the procedure. This helps to minimise the risk of infection. The tube can also be used during the procedure to give any other medications, such as pain relief or sedation as required.
- The risks and benefits of the procedure will be explained to you, and you can raise any questions you might have with the doctor. You will then be asked to sign a consent form.
- Having an S-ICD implanted is a relatively straightforward process and is carried out in a room called a catheter lab, which looks like an operating theatre. The team usually consists of one or more cardiology doctors, a cardiac physiologist, one or more nurses and a radiographer. All members of the team will be wearing a hat and mask.
- You will be taken into the catheter lab and asked to lie flat on a narrow table. You will be attached to a heart monitor (ECG), have a blood pressure cuff put on your arm and a probe attached to your finger. Your left arm will be placed on and lightly strapped to an arm board. This allows the arm to be extended outwards to enable the device to be placed on the left chest wall.
- A dummy lead and device may temporarily be taped to your chest and viewed under X-ray conditions to determine the ideal positioning relative to the heart and breastbone. Once the correct position has been identified, the doctor may use a marker to draw on the front and side of your chest. These marks will be visible once the chest area has been cleaned with an

antiseptic solution and sterile sheets placed over you. This is to ensure the correct positioning of the device and lead.

- The doctor will inject a local anaesthetic into the skin near to where your S-ICD will be inserted. This will sting initially but the skin will soon become numb. A cut is made on the left side of the chest near to the rib cage and the doctor will make a 'pocket' for the device to sit in between the muscle and fat layers. You may feel a tugging sensation when this is being done, which may be uncomfortable.
- One or two small incisions are made to the side of the breastbone, which allows the lead to be placed under the skin. The lead is connected to the generator, which will then be placed into the pocket that was created earlier.
- The device will be tested to ensure that the signals are appropriately detected. An abnormal rhythm is induced, which the device detects and then returns to a normal rhythm. You will be asleep or heavily sedated during this part of the procedure.
- The skin is closed with absorbable stitches or glue. The wound site is then covered with a transparent dressing that allows for close monitoring of the wound at home. The procedure can take between 1-2 hours in total.
- You will then spend 2-4 hours recovering on JSU ward, where you will have a chest X-ray and a post implant device check. Your post implant care will be explained during the post implant check.

What happens after the S-ICD implant?

You will usually be able to go home later in the afternoon or evening depending on the time you had the procedure done. In some cases, you may need to stay overnight.

Please arrange for a friend or relative to pick you up from the hospital and stay overnight with you, as you are not allowed to drive yourself.

You will be given an S-ICD information pack while recovering on the day ward and can read this when you get home. This will provide you with further details on the post implant care.

- **Wound care:** the wound will be closed with either absorbable stitches or a special type of skin glue. If the wound has been covered with a dressing, please keep it on for 7 days. If glue has been used, this will gradually flake off as the wound heals. You should keep the wound dry for 7 days. If you notice any signs of redness, swelling, oozing, or bleeding at the wound site, or find that the wound site becomes hot or tender to the touch and you have a high temperature, please get in touch with the Cardiac Rhythm Management (CRM) Clinic so that this can be dealt with as soon as possible. The Cardiac Care Unit (CCU) can be contacted out of hours (contact details below).
- **Pain:** the wound can feel quite bruised and sore for a few days after the implant and you should take painkillers as appropriate. There may be general tenderness for a week or two after the procedure.
- **Arm movement:** pain and tenderness may limit movement initially. Unlike traditional ICD's where arm movement needs to be limited to minimise the risk of a lead dislodging, there are no specific limitations on arm movement following an S-ICD implant. Avoid doing movements that put pressure on the wound site. Contact sports like rugby or football should be avoided.

- **Driving:** you must tell the DVLA that you have had an ICD fitted.
 - Group 1 licence: if your device was implanted prophylactically (as a preventative measure) or you had a heart rhythm that did not incapacitate you, driving may resume 1 month after implantation if you remain asymptomatic and no ICD therapies have been delivered. If you had a cardiac arrest or had an abnormal rhythm that was associated with incapacity, you will not be able to drive for 6 months.
 - Group 2 licence (e.g. HGV driver): you must not drive, and your licence will be refused or revoked permanently. Further information can be found on the DVLA website.
 - If you receive any type of therapy from your device, you may need to notify the DVLA and stop driving for a further period of 6 months. Please ask your doctor for guidance in this regard.

Guidance is subject to change so please ensure you check the DVLA website for up-to-date advice: www.gov.uk/guidance/cardiovascular-disorders-assessing-fitness-to-drive#implantable-cardioverter-defibrillator-icd

- **Insurance:** you should tell your driving and travel insurance company that you have had an ICD fitted.
- **Electrical gadgets, mobile phones, and magnets:** the recommendation is to keep all electrical gadgets and mobile phones 6 inches (15cm) away from your device. It is best not to keep your mobile phone in a shirt or jacket pocket that may be near to your device. If you have an induction hob, you should aim to keep your device 1-2 feet away from the hob. Properly maintained household appliances, including microwaves are safe to use.
- **MRI scanners:** the S-ICD is MRI conditional and is designed to allow you to safely undergo an MRI scan if required. Certain conditions need to be met and settings may need to be adjusted prior to and after having an MRI. A member of your medical team can contact the CRM team if you require an MRI.
- **An ID card** will be given to you, and you should **always carry this around with you**. This is particularly important when attending a hospital or a dental appointment and when travelling.
- **A device check** will be arranged for you in 6 weeks' time. It is important to attend regular checks to ensure the appropriate functioning of your S-ICD. Some of these checks may be done remotely via a home monitoring system, which will be explained to you on the day of implant or at your first check.



Latitude NXT remote monitor, *Image provided courtesy of Boston Scientific.*

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Useful contact information

Cardiac Rhythm Management (CRM) Clinic:	0118 322 6636 (Mon - Fri, 8am - 6pm)
Jim Shahi Unit (JSU):	0118 322 6502 (Mon - Fri, 8am - 6pm)
Cardiac Care Unit:	0118 322 6684 (Mon - Sun, 6pm - 8am)
Clinical Admin Team (CAT 11) (bookings):	0118 322 6676 (Mon - Fri, 8am - 5pm)
British Heart Foundation:	www.bhf.org.uk
Arrhythmia Alliance	www.heartrhythmalliance.org/aa/uk/patient-booklets
DVLA	www.gov.uk/guidance/cardiovascular-disorders-assessing-fitness-to-drive#implantable-cardioverter-defibrillator-icd
Boston Scientific	Subcutaneous Implantable Defibrillator (S-ICD) – Official Patient site

This leaflet is printed privately for the Cardiac Fund. It was set up in 1976 for the purpose of providing cardiac services that would otherwise not be available through National Health resources. Our Cardiac Laboratory was equipped through the fund and many other areas in the Department have also benefited from equipment and staff training.



If you would like to contribute, please scan the QR code below to donate direct to the fund online, alternatively, cheques should be made payable to:



The Royal Berks Charity Cardiac Fund U226

Royal Berks Charity
Royal Berkshire NHS Foundation Trust London Road
Reading RG1 5AN Telephone 0118 322 8860 www.royalberkscharity.co.uk

To find out more about our Trust visit www.royalberkshire.nhs.uk

Please ask if you need this information in another language or format.

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Next review due: June 2026.