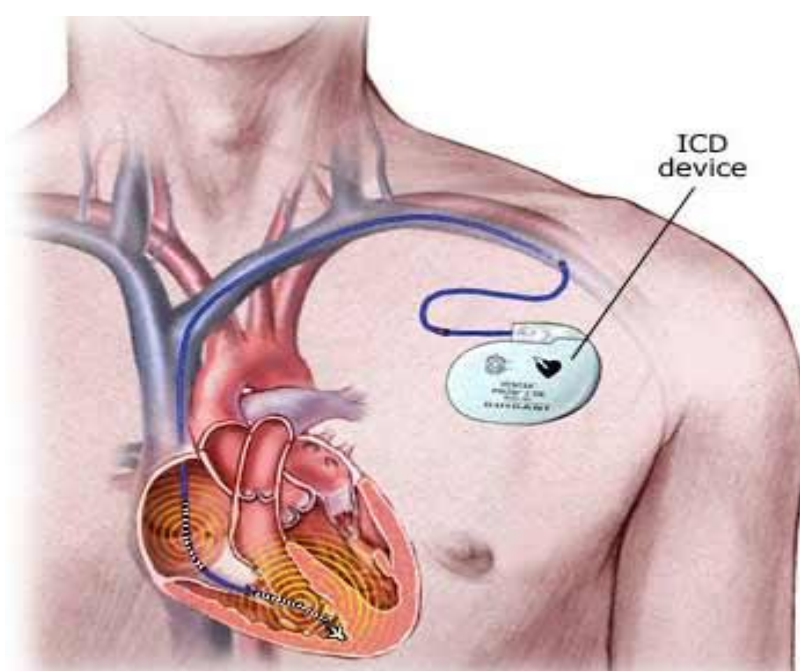


Information booklet for patients having an Implantable Cardioverter Defibrillator (ICD)



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Introduction

This booklet has been written to provide information to you and your family about a device called an Implantable Cardioverter Defibrillator (ICD). It explains what an ICD is, how you are prepared for having an ICD implanted, your recovery and living with your ICD at home.

Section A – The ICD

What is an ICD?

An ICD is a small slim box which contains a pulse generator, a computer, a long life battery and electrical leads which are connected to your heart. It looks for and treats dangerous, fast heart rhythms if they occur.

Why do I need an ICD?

You have had, or are at risk of having a dangerous, fast heart rhythm. You can read more about guidelines for having an ICD from the National Institute for Health and Care Excellence (NICE).²

Will an ICD make me feel better?

No. An ICD only provides treatment for dangerous, fast heart beats. It will not make you feel better or worse after it has been implanted.

What will an ICD do?

An ICD has several functions. It can

- watch for dangerous, fast heart beats
- give a shock to the heart if it detects a dangerous, fast heart beat
- give a burst of fast pacemaker beats to try to stop a dangerous, fast heart beat (anti-tachycardia pacing or ATP)
- give pacemaker beats when the heart goes too slow (anti-bradycardia pacing or ABP).

It will not stop you from having a heart attack.

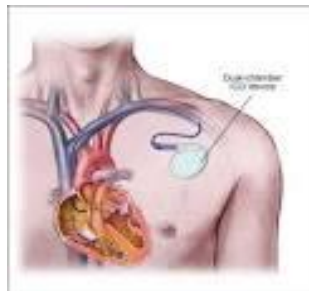
Section B – Preparing to have an ICD

What are the risks of the procedure?

One person in 20 may have one of the following complications, however all the risks listed below are treatable.

- The leads of the ICD may puncture the lining of the lung. A tube called a chest drain will need to be inserted into the chest wall to re-inflate the lung.
- The leads of the ICD may puncture the wall of the lung causing blood from the lungs to leak into the lining of the lung. A chest drain will need to be inserted into the chest wall to re-inflate the lung.
- The leads can accidentally damage the blood vessels when being moved into position causing discomfort, bruising and swelling.
- A blood clot forms in the brain causing a stroke or in the lungs causing a pulmonary embolism.
- The ICD leads move from the area in which they were originally placed and require repositioning.
- The leads may puncture the heart muscle and cause blood to enter the outer sac (pericardial effusion).

How am I prepared for insertion of my ICD?



Position of an ICD¹

A letter will be sent to you containing details on date of your procedure, your hospital admission including the ward where you will be admitted, what personal belongings to bring and when to stop eating and drinking.

When one of the doctors involved in implanting your ICD explains the risks and benefits of having the device implanted, they will ask you to sign a consent form. If you have any questions about the procedure or its risks and benefits, please ask your doctor at this time. You can seek a second opinion at any time if you

wish. The consent form may be signed at your Out Patients' Appointment (OPA) or on the day of your procedure.

Your nurse will complete a checklist and prepare you for your procedure. A hollow tube called a cannula will be inserted into your arm so that medicines can be given. Your nurse will escort you to the Catheter Laboratory (Cath Lab) recovery area and you will be welcomed by a member of the Cath Lab team who will then ask you some questions to complete the checklist. You will be given an anti-biotic through your cannula as a preventative measure against infections.

How is my ICD inserted?

Your body will be covered with sterile towels so that the risk of infection is minimised. The doctor will inject medications into your cannula to help you feel relaxed and sleepy. This is called conscious sedation. You will also have analgesia (usually paracetamol infusion). Then a local anaesthetic will be injected underneath the collar bone area (usually on the left side) to make it numb. Some people say this is like a tiny sting but it is not painful and acts quickly to numb the area.

Your doctor will make an incision approximately five centimetres in length underneath your collar bone and create a sub-cutaneous pocket under the skin. If you are having a sub-pectoral pocket, the doctor will place the pocket under your muscle. A vein will be made accessible so that your doctor can pass one or two leads into the heart. Once the leads are in place, they will be tested to ensure they are positioned well and are functioning correctly. They will be connected to the ICD box, which is then placed inside the pocket. The ICD box contains the computer and battery generator. The wound is then closed with dissolvable sutures underneath your skin and glue on top of your skin.

A dry dressing may be applied to your wound. Occasionally a tight bandage will be applied called a pressure bandage to ensure swelling and bruising is kept to a minimum.

What happens after my ICD has been implanted?

Once the procedure is completed, you will spend a short time in the recovery area of the Cath Lab. You will be taken back to the ward where your nurse will continue to take care of you. Your wound and observations will be checked regularly until you have fully recovered from the procedure. This varies with each individual patient but you will need to remain in bed for approximately four hours. It is important that you tell your nurse if you feel unwell or have pain, swelling and/or bleeding from your wound straight away. Your nurse can give you simple analgesia as prescribed and you may eat and drink as soon as you feel well enough.

Section C – Your recovery

When can I go home?

You should be able to go home later the same day or the day after providing your consultant Cardiologist and nurse are happy that your treatment is complete, you have fully recovered, there are no complications, your wound is satisfactory and your ICD has been checked by the Cardiac Physiologists. They will provide you with a remote monitor (see page 11) and an Identification (ID) card. The ID card should be with you at all times.

Will I feel any pain after my ICD has been implanted?

You may feel some pain and discomfort in the first week or two after your ICD has been implanted. This can be unpleasant but it is to be expected. Simple analgesia such as paracetamol should help to reduce pain and swelling. Make sure no other medication you take has paracetamol in it. Always read the label, take the dose as prescribed and do not take medication you know you are allergic to. Consult your General Practitioner (GP) if you have any concerns. If you have a sub-pectoral implant (under the muscle) it may be more uncomfortable than if you have a sub-cutaneous implant (under the skin). If you are experiencing severe pain at any time you should consult your GP and inform your Arrhythmia Nurse.

How do I care for my wound at home?

Any outer dressing should be removed by the day after you are discharged. The glue is water resistant so it is fine to have a bath or shower the day after your device has been implanted. However:

- Try not to get the glue too wet for any length of time
- Do not soak the wound for the first two weeks
- Do not apply any creams or lotions to the wound
- Gently wash around the wound with warm water and pat the area dry with a clean towel
- Leave the wound open to the air underneath loose fitting clothing
- Ladies can wear their usual undergarments if it is comfortable to do so
- Your skin should heal in two or three weeks, however the tissues underneath your skin may take up to six weeks to fully heal
- The glue may fall off gradually or all in one piece. Do not be tempted to pick off parts of the glue
- The wound may be itchy, which is a normal part of wound healing. Do not scratch the area around your wound
- Avoid heavy lifting for the first four to six weeks.

What do I do if my wound looks infected?

Some discomfort, bruising and swelling is normal in the week after your procedure. However, if your wound looks infected you may have:

- Pain
- Swelling
- Redness
- Oozing of pus, blood or fluid
- Inflammation
- High temperature (pyrexia)
- Offensive odour from the wound
- Wound breakdown.

You should contact your GP and Arrhythmia Nurse team straight away. Your GP may wish to assess your wound and prescribe an anti-biotic. It may be appropriate to bring you back to Outpatients clinic earlier than planned to assess your wound. The Arrhythmia Nurse will assess your symptoms over the phone and will decide on further management accordingly.

It is extremely important that you seek advice and treatment for suspected infection promptly. Wound infection may have serious health complications and you may require hospital admission for intravenous antibiotics and removal of your ICD.

If your wound opens up and you can see the leads or the generator box you **must go to your nearest hospital straight away**. If this occurs there is a high risk of infection and you must seek medical attention on the same day.

How can I aid my recovery after my ICD has been implanted?

It is important that you stay active after your ICD has been implanted. However, you should take it easy for the first week while your wound heals. You can wash, dress and move around the home as normal on the day after your procedure. Do not lift your arm on the side of the ICD above shoulder height or lift anything heavy with that arm for the first four to six weeks. However, you should move your arm normally to prevent your arm from becoming stiff.

What about physical activity and exercise with an ICD?

You should be able to return to most usual activities, exercise, sports and hobbies. It is important to work at moderate intensity, where you feel that you are breathing harder but feel comfortable to continue and are able to speak. Activities where you are working harder than this may not be suitable (e.g. squash). You

should always start and finish any activity slowly so that you incorporate a warm up and cool down in whatever you are doing. For example if you are going out for a walk, start off and finish at a slower pace. Do not continue exercising if you have any symptoms, such as pain, dizziness and palpitations or if you feel unwell. If symptoms persist, you should speak to your Arrhythmia Nurse or GP.

Your heart rate will increase when you exert yourself; this is normal. The ICD is programmed to be able to tell the difference between a normal increase in heart rate associated with exercise and dangerous, fast heart rhythms so the ICD should not give you a shock. You should take care with hobbies or sports which involve repetitive, vigorous above-the-shoulder movement on the side of the ICD, such as golf and racquet sports, particularly if you hold the club or racquet on that side. Good technique may help to minimise the risk of straining the leads of the device.

Avoid dangerous lone activities such as outdoor swimming or climbing ladders. It will be dependent on your underlying cardiac condition as to whether swimming is suitable for you. Breaststroke is the recommended stroke. A goal of at least 30 minutes of moderate intensity activity most days of the week plus avoiding long periods of being sedentary will help keep your heart healthy. If you are unable to do 30 minutes in one go, perhaps due to another health condition, you can break the 30 minutes into three bouts of 10 minutes.

Depending on your underlying health condition you may be limited in the type or level of activity you can do. Before attempting any new physical activity or if you have any questions about physical activity and exercise with an ICD, speak to you Arrhythmia Nurse or doctor.

Any sport which involves bodily contact such as football, rugby, boxing, kick boxing or cage fighting are not usually recommended as there is a risk of damaging the ICD or its leads. Sports such as golf, tennis and indoor swimming should be played with consideration to your ICD. You should take care when participating in these sports and try to avoid direct impact to your ICD and the leads whenever possible. You may need to adjust your golf swing technique to ensure you are not straining the leads by keeping your arm close to your body during the swing.

What medicines do I take after my ICD has been implanted?

You should continue to take all the medicines you were taking before your ICD was implanted unless you have been told otherwise. You can discuss this with your Arrhythmia Nurse if you have any questions. Some of your medicines will help to reduce the risk of dangerous, fast heart rhythms occurring, however they do not guarantee that you will never have a dangerous, fast heart rhythm in the future.

It is important you do not stop taking any of your medicines without the knowledge of your doctor or consultant Cardiologist. If you are struggling to cope with the side effects of any of your medicines you should discuss them with your

GP. Your GP and consultant Cardiologist will regularly review your medications to ensure you are taking the correct dose and type.

You can write a list of your medicines here if you wish.

NAME OF MEDICINE	DOSE	TIME TAKEN	WHAT THEY ARE FOR

Section D – Living with your ICD

How am I monitored after my ICD has been implanted?

You will be closely monitored on a regular basis after your ICD has been implanted. Your first Outpatients Appointment (OPA) will be in three to four weeks after your ICD was implanted and this will be delivered to your home address. If you will be staying with a family member for a while after your procedure, please ensure you tell the Cardiac Physiologists where to send the OPA to. This is an important appointment as it gives the team an opportunity to check your wound is healing well, that your ICD is set at the right settings for you and to interrogate your ICD for any activity or “therapy” since it was inserted. You will be seen in clinic three months later, then every six to 12 months, depending on your circumstances.

How will I feel emotionally after my ICD has been implanted?

Having an ICD implanted can be a major turning point in your life. No two people will feel the same and you may experience many emotions during the whole time you have your device. There is no right or wrong way to feel about having an ICD implanted. You may feel a sense of security, safety and reassurance that you have your ICD. You may feel sadness, anxiety, anger, a sense of loss, low in mood or vulnerability but it is recommended that you focus on the positive aspects of having your ICD to help you come to terms with the negative. It is important that you recognise your thoughts and feelings and talk to your family, significant others and friends about it. The consultant Cardiologist, Arrhythmia Nurse, Cardiac Physiologist and GP can also provide support.

What does it feel like to receive a shock?

Everyone will experience a shock differently. Some people barely feel it, some describe it as a thump or a kick to the chest and some feel a “sense of impending doom”. You may feel intense discomfort when your ICD gives you a shock or it may make you cry out. You may fall down (this may be because you are fainting or because your ICD is delivering a shock). You may feel minor muscle aches for a short time. If you lose consciousness immediately or if you are asleep, you may not feel the shock. It is important to recognise and accept that however unpleasant the experience was for you, it has just treated a dangerous, fast heart rhythm.

What is remote monitoring?

MyCarelink monitor ©



2

Latitude monitor ©



3

Merlin monitor ©



4

Remote monitoring is a way we can monitor your ICDs activity and life span instead of asking you to come to hospital for an OPA. Remote monitoring equipment is free to you. All new ICD devices now use wireless (Wi-Fi) technology. Wi-Fi signals are used to connect with your ICD at home and almost all of the information that is required can be obtained. Remote monitoring can see how well your leads are working, how long the battery has left before it is depleted and if the ICD has given any therapy or shocks.

The Cardiac Physiologists will discuss remote monitoring with you, either at your box check after your ICD has been implanted or at your first OPA. Having this equipment installed in your home has many advantages.

- When you go home, you should set up the remote monitor as instructed by the Cardiac Physiologists. You can follow the advice booklet which accompanies your remote monitor and perform a “test transmission”. You should then telephone the Cardiac Physiologists and tell them you have done a test transmission. This is important because it tells you that your remote monitor is ready and working.
- Your ICD will be checked periodically via the remote monitor from home. You will receive a letter of confirmation from the Cardiac Physiologists to say they have received an automatic remote monitor download. Your ICD will then be checked annually in clinic. This is particularly suitable for those patients who live a long distance away or have trouble getting to hospital.
- You can do a download at any time and call the Cardiac Physiologists if you think your ICD has delivered a shock. They will examine your download and analyse the results. You can also contact your Arrhythmia Nurse or Cardiac Physiologist for advice. A member of the team will call you back when the results are available and advise you.

- You can do a download at any time and call the cardiac Physiologists if you think you have damaged your ICD or you have received one or more shocks in quick succession. A download may detect a loose, broken or “fractured” lead which has confused the ICD into thinking that you are experiencing a dangerous, fast heart rhythm. This is rare but can occasionally happen if your ICD has recently been implanted, been damaged or has been in for a long time. This will need urgent attention. A member of the team will contact you and advise you.

What do I do if my ICD fires/goes off/gives me a shock?

All of the above mean the same thing. Your ICD has delivered a shock to your heart because it has detected a dangerous, fast heart rhythm. If you have had a shock, you must not drive. The driving restriction for an appropriate shock (ie, the ICD has recognised and treated a fast, dangerous heart rhythm) is six months. The driving restriction for an inappropriate shock (ie, the ICD has incorrectly recognised a rhythm which it thinks is a dangerous, fast heart rhythm) is one month after the fault has been identified and corrected.

Try to remain calm.

Try to sit down or if you feel unwell, lie down. You may be outdoors when this happens. Find a safe place to sit or lie but you may not always have time to do so. If you are in a chair or in bed, stay where you are.

If you felt well before the ICD fired and you feel well afterwards, call your Arrhythmia Nurse team and let them know. They will advise you on what to do. If you have a remote monitor, do a download and call the Cardiac Physiologists.

If you feel very unwell after your ICD has fired, call 999 and ask for an ambulance to take you to the nearest Emergency Department (ED). If you come to Wythenshawe hospital, where your device was implanted, we will “interrogate” your ICD at the earliest opportunity to see what your ICD has done.

If you go to another hospital, make sure the doctors are aware you have an ICD and show your ID card to them. They may wish to contact us at Wythenshawe hospital. It may be possible for the doctor to “interrogate” your ICD if this technology is available at their hospital.

If you have had several shocks in close succession, you should ask someone to drive you to your nearest hospital and seek medical attention. Remember, if your ICD has fired, it is most likely because it has recognised and treated a dangerous, fast heart rhythm.

When can I drive again?

It depends on why your ICD was implanted. You can obtain detailed information from the Driver & Vehicle Licencing Agency (DVLA).⁵ Generally speaking, if you **HAVE HAD** a dangerous, fast heart rhythm and this was the reason your ICD was implanted, then you cannot drive for six months.

If you are **AT RISK OF HAVING** a dangerous fast heart rhythm, then you cannot drive for one month. The Arrhythmia Nurse or consultant Cardiologist will be able to advise you on driving restrictions. Make sure you understand how long you should wait to drive again before you leave hospital. The DVLA have strict guidelines on driving and it is against the law to drive your vehicle while you are banned.

Can I do anything to stop my ICD from firing?

No. Your ICD is there to treat dangerous, fast heart rhythms. So if it detects these rhythms, it needs to treat them. You can help reduce the likelihood of having these rhythms by taking the medicines your consultant Cardiologist has prescribed for you. It is important to continue to take these medications unless a doctor or your consultant Cardiologist says so. Taking your medicines will not guarantee you will never get a shock though.

You should always carry your ICD ID card with you and inform any doctor, dentist or medical/nursing staff that you have an ICD. Some people also wear a bracelet or neck chain with "I have an ICD" engraved.

Can my ICD harm others if they are touching me when it fires?

No. Some people describe a feeling of pins and needles around the contact points between their bodies. Some people are more surprised at the suddenness of their partner/relative/friend receiving a shock.

Do I need to avoid any electrical equipment now I have an ICD?

Yes. You can find a comprehensive list of items later in this booklet. Please see "**What can I do and not do after my ICD has been implanted?**" in Appendix A.

You will not be able to have a Magnetic Resonance Imaging (MRI) scan once you have a standard ICD implanted. However, some ICD's can be implanted which are "MRI compatible". Your consultant Cardiologist will decide if these are suitable for you and you will be informed if your ICD is MRI compatible or not when it has been implanted. When you go to any airport, show your ICD ID card to the security guards and follow their instructions. When you enter shops, walk through the entrance at a normal speed and do not linger near the security equipment.

How long will my ICD last?

It depends on how active your ICD has been. Most ICDs last for approximately six years give or take a year! Generally speaking, the more shocks an ICD delivers, the more battery it uses and the shorter it will last. You will be reviewed every six months, either in clinic or by doing a download at home from your remote monitor. If your battery life is coming to an end the Cardiac Physiologists will monitor you every three months. You will also be placed on the waiting list to have the battery replaced. This is called a “box change”. When appropriate, you will be admitted to hospital as a day case to have your battery replaced.

Your ICD is fitted with an alarm which is activated when the battery is running low. Your ICD may beep to alert you that your battery is low when you do not have a clinic appointment soon. Please ring the Arrhythmia Nurse team or the Cardiac Physiologist and they will advise you on what to do. We may arrange to bring you to clinic to switch the alarm off while you are waiting for your box change.

What can I do and not do after my ICD has been implanted?

All ICDs have a protective shield so the majority of items which you come into contact with will not affect the normal functioning of your ICD. However, some items which generate or use electricity, or transmit wireless signals have electromagnetic fields around them. Examples of these are portable generators, power drills, or mobile phones. Electromagnetic compatibility is the relationship between these electromagnetic fields and your ICD.

If items with electromagnetic fields are too close to your ICD and your ICD detects these fields, they may affect the normal function of your ICD temporarily. This may also occur if the items are in poor working order or improperly wired.

There is a risk that your ICD delivers a shock when it is not needed and also withholds a therapy when it is needed. It is recommended that you only use equipment in good working order and at a specified minimum distance from your ICD.

If you feel dizzy, lightheaded, changes in your heart beat or receive a shock while using equipment with an electromagnetic field, stop what you are doing immediately and move away from it. Any temporary effect is unlikely to cause reprogramming or damage to your ICD. If you still feel unwell after removing yourself from the electromagnetic field you should contact your doctor as soon as possible or if you are extremely unwell, call 999.

A list of the most common equipment inside and outside the home and specific advice on their risk can be found in Appendix A.

They are listed in categories:

- Household and hobbies
- Tools and industrial equipment
- Communications and office equipment

- Medical and dental procedures.

Is there a support group for people who have an ICD?

Yes there is.

The ICD support group was set up in 2001 at UHSM to provide communication, education and support for patients with ICDs. There is a Chairman, Secretary, Treasurer and committee members, all of whom have an ICD implanted.

They produce a newsletter called The Defibber News three times a year and this is sent to all patients with an ICD. Patients are encouraged to write about their own experiences with living with their device and the support group welcomes stories from new patients. There are also interesting articles which are relevant to people with ICDs.

Shortly after the Defibber News is published, patients and their families have the opportunity to come to an informal meeting at UHSM. At these meetings, patients can meet other people with ICDs from 1 pm. A guest speaker will give a presentation on current topics for patients with ICDs at 2 pm. The Chairman, Arrhythmia Nurses and Cardiac Physiologists like to be there too so patients can have a chat with them if they wish.

UHSM also has a team of male and female patient volunteers, all of whom have an ICD. In their spare time they come and chat to new patients who have or need an ICD. They offer support and will share their experiences of living with an ICD. Patients can ask the Arrhythmia Nurses or Cardiac Physiologists if they would like to meet a volunteer. Volunteers cannot offer medical advice.

When can I resume sexual intercourse?

Sexual intimacy for most people does not pose a medical risk. You should be able to resume sexual relations when you and your partner feel ready. It is completely normal for one or both of you to feel anxious about this. Talking to each other and being open and honest about your fears and anxieties will help you both. Acknowledging and understanding each others' worries and needs is an important part of "getting back to normal".

If you get a shock during sex, your partner will come to no harm. Some people describe a feeling of pins and needles around the contact points between their bodies but the shock will not hurt them. They may be taken by surprise by the shock that is given to you, as indeed, you may be too. This can be distressing to you both, but talking about the experience will help you to cope with the incident.

What if I want to deactivate my ICD?

To deactivate an ICD means turning off the shock lead of your ICD. You can choose to have the shock lead switched off. If the shock lead is switched off your ICD will no longer monitor for and treat dangerous, fast heart rhythms. There are several reasons why you might want your ICD to be deactivated.

These include:

- You are at the end of your life and the delivery of a shock may delay a natural death.
- You do not want to experience a shock during the end stage of your life.
- You no longer wish for an ICD to be part of your care and treatment.

Whenever possible, the discussion to deactivate your ICD should be planned. It should take place between you, your consultant Cardiologist/doctor/GP and your family or significant others with support from your Arrhythmia Nurse team and the Cardiac Physiologists. You must fully understand the implications and benefits of switching off the shock lead of your ICD. Support will be available to you and your family whenever you have new questions and concerns.

Deactivation of the shock mode of an ICD does not end a person's life, but will allow for a natural death when the time comes without the risk of unpleasant and unnecessary shocks.⁴

The process of deactivating any part of your ICD is quick, totally painless and completely reversible. All modes can be switched back on again at any time in your life.

You may feel uncomfortable discussing deactivation of your ICD with your family and significant others and this is perfectly understandable. It is a sensitive issue and talking about death when so much focus has been around improving your life can be confusing. However, if you know what you want and when you want it to happen, your family will be comforted by this and be spared the fear of making the wrong choices at the end of your life. It is YOUR ICD, YOUR BODY and YOUR DECISION. At the end of life, it is not usual to have a life threatening arrhythmia but it can sometimes happen. Deactivating the shock lead of your ICD will remove the possibility of receiving a shock which may cause you pain and distress in your final hours or days. However, the ICD will not treat these rhythms which are life threatening.

The action of deactivating an ICD will neither bring about death, nor prolong life.

Who do I call if I need help?

SPECIALITY	DEPARTMENT	NUMBER
Remote monitor, downloads	Cardiac Physiologists	0161 291 4615
Medicines, symptoms, driving licence enquiries, general enquiries	Arrhythmia Nurse Team	April Hopkins (Lead) 0161 291 5998 Adrienne Unsworth 0161 291 5443/ 0161 291 5076
Appointments, driving licence forms	Secretary to Dr Fox	0161 291 2743
	Secretary to Dr Davidson	0161 291 2390
	Secretary to Dr Campbell	0161 291 2388
	Secretary to Dr Williams	0161 291 2624
	Secretary to Dr Brown	0161291 4152

Appendix A

HOUSEHOLD AND HOBBIES – providing the item is used as intended and in good working order

ITEM	RECOMMENDATION
Abdominal stimulator	Not recommended
Antenna for radio controlled items	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Back massager hand held	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Battery powered shaver	No known risk
Car/motorcycle components of ignition system	Special consideration – maintain at least 12 inches or 30 centimetres from ICD
Casino slot machines	No known risk
CD/DVD/VHS player or recorder	No known risk
Charging base of electric toothbrush	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Corded electric shaver	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Dishwasher	No known risk
Electric blanket	No known risk
Electric fence	Special consideration – maintain at least 12 inches or 30 centimetres from ICD
Electric grocery cart motor	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Electric guitar	No known risk
Electric pet containment fence – buried wire and indoor antenna	Special consideration – maintain at least 12 inches or 30 centimetres from ICD
Electronic body fat scale	Not recommended

Electronic weighing scale	No known risk
Garage door opener	No known risk
Golf cart motor	Minimal risk – maintain at least six inches or 150 centimetres from ICD
Green transformer box in yard	Special consideration – maintain at least 12 inches or 30 centimetres from ICD
Hair drier – hand held	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Hand held kitchen appliances (electric mixer, knife)	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Heating pad	No known risk
Hot tub	No known risk
Household battery charger	No known risk
Induction stove	Special consideration – maintain at least two feet or 60 centimetres from ICD
Ionized air filter	No known risk
Iron	No known risk
Kitchen appliances, small and large - blender, can opener, refrigerator, stove, toaster	No known risk
Low voltage residential power lines	No known risk
Magnet (fridge, household)	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Magnetic mattress pad/pillow	Not recommended
Magnetic therapy products	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Massage chair/pad	No known risk
Medical alert necklace	No known risk
Metal detector (beach comber) from search head	Special consideration – maintain at least two feet or 60 centimetres from ICD
Microwave oven	No known risk
Remote control for CD, DVD player, television, VHS	No known risk
Salon hair drier	No known risk

Sewing machine motor	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Speakers	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Tanning bed	No known risk
Television	No known risk
Treadmill motor	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Ultrasonic pest controller	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Vacuum cleaner motor	Minimal risk – maintain at least six inches or 15 centimetres from ICD

TOOLS AND INDUSTRIAL EQUIPMENT- providing the item is used as intended and in good working order

ITEM	RECOMMENDATION
Air compressor (bench mounted or free standing tools for motors with 400 horsepower or less)	Special consideration – maintain at least two feet or 60 centimetres from ICD
Callipers (battery powered)	No known risk
Circular saw	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Drill press	Special consideration – maintain at least two feet or 60 centimetres from ICD
Drills (battery and electric powered)	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Electric chainsaw	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Flash light	No known risk
Gas powered tools – from components of ignition system – lawn mower, snow blower, weed whacker, chain saw	Special consideration – maintain at least 12 inches or 30 centimetres from ICD
Generators with 20 kW or less	Special consideration – maintain at least 12 inches or 30 centimetres from ICD
Grinder	Special consideration – maintain at least two feet or 60 centimetres from ICD
Grinder (hand held)	Minimal risk – maintain at least six

	inches or 15 centimetres from ICD
Hedge trimmer – electric powered	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Jumper cables	Special consideration – maintain at least two feet or 60 centimetres from ICD
Laser level	No known risk
Pressure washer	Special consideration – maintain at least two feet or 60 centimetres from ICD
Sander	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Screwdriver (battery powered)	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Soldering gun	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Soldering iron	No known risk
Stud finder	No known risk
Table saw	Special consideration – maintain at least two feet or 60 centimetres from ICD
Weed whacker (electric powered)	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Welding equipment with current over 130 amps	Not recommended
Welding equipment with current under 130 amps	Special consideration – maintain at least two feet or 60 centimetres from ICD

COMMUNICATIONS AND OFFICE EQUIPMENT- providing the item is used as intended and in good working order

ITEM	RISK
Amateur radio	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Amateur radio (3 to 15 watts) from antenna	Special consideration – maintain at least 12 inches or 30 centimetres from ICD
Bluetooth technology	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Computers	Minimal risk – maintain at least six

	inches or 15 centimetres from ICD
Cordless headphone sending unit (TV ears)	Minimal risk – maintain at least six inches or 15 centimetres from ICD
E readers (Kindle)	Minimal risk – maintain at least six inches or 15 centimetres from ICD
E tablets (iPad)	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Fax machine	No known risk
Global Positioning Machine (GPS)	No known risk
Ham radio	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Ham radio (15 to 30 watts) from antenna	Special consideration – maintain two feet or 60 centimetres from ICD
Ham radio (3 to 15 watts) from antenna	Special consideration – maintain at least 12 inches or 30 centimetres from ICD
Head sets	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Home wireless electronics – from antenna	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Infra-red scanner	No known risk
iPod (digital music player – non transmitting)	No known risk
iPod (digital music player - transmitting)	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Laptop/computer	No known risk
Marine radio	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Marine radio (15 to 30 watts) from antenna	Special consideration – maintain at least 12 inches or 30 centimetres from ICD
Marine radio (3 to 15 watts) from antenna	Special consideration – maintain at least 12 inches or 30 centimetres from ICD
Mobile phone three watts or less – from antenna	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Modems	Minimal risk – maintain at least six inches or 15 centimetres from ICD

Pager (receiver only)	No known risk
Photocopier (copying machine)	No known risk
Printer	No known risk
Radio (AM/FM)	No known risk
Remote car starter	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Remote keyless entry	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Routers	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Scanner	No known risk
Security badge wall scanner	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Smart meters (utility companies)	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Smart phones	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Walkie talkie (15 to 30 watts) from antenna	Special consideration – maintain at least 12 inches or 30 centimetres from ICD
Walkie talkie (3 to 15 watts) from antenna	Special consideration – maintain at least 12 inches or 30 centimetres from ICD
Walkie talkie three watts or less – from antenna	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Wireless communication devices (computers, modems, routers, headsets, smart phones, Bluetooth)	Minimal risk – maintain at least six inches or 15 centimetres from ICD
Wireless controllers (video game consoles)	Minimal risk – maintain at least six inches or 15 centimetres from ICD

MEDICAL AND DENTAL PROCEDURES – if used as intended and in good working condition

ITEM	RISK
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Acupuncture – no electrical stimulus	Acceptable risk
Acupuncture with electrical stimulus	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant /cardiologist
AED (Automated External Defibrillator)	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
Bone density test – x-ray	Acceptable risk
Bone density ultrasound – on heel or hand	Acceptable risk
Capsule endoscopy	Acceptable risk
Catheter ablation (microwave and radio frequency)	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant /cardiologist
Cauterisation (or any electro-surgery which use an electric probe to control bleeding, cut tissue or remove tissue)	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
CT (Computerised Axial Tomography) scan	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
Dental drills	Acceptable risk
Dental ultrasonic scaler/cleaner	Acceptable risk
Diathermy (high frequency, short wave and microwave)	Not recommended
Digital hearing aid transmitting loop	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
ECG (electro-cardiograph)	Acceptable risk
Echocardiogram	Acceptable risk
Elective cardioversion	Acceptable risk with precautions –

	inform your physician that you have an ICD and/or inform your consultant Cardiologist
Electrolysis	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
External defibrillation	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
Fluoroscopy (diagnostic x-rays)	Acceptable risk
HBOT (Hyperbaric Oxygen Therapy)	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
Hearing aid (in or behind the ear)	Acceptable risk
Heart monitor	Acceptable risk
Laser surgery	Acceptable risk
Lithotripsy	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
Mammogram	Acceptable risk
MRI (Magnetic resonance Imaging) scan with standard ICD implanted	Not recommended if ICD not MRI safe
MRI scan with MRI safe ICD implanted	Inform your consultant Cardiologist and Cardiac Physiologist so that ICD settings can be adjusted immediately prior to MRI scan
Muscle stimulators and other devices sending current into your body	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
NMES (Neuro Muscular Electrical Stimulation)	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
PET scan (positron Emission	Acceptable risk

Tomography)	
PH capsules	Acceptable risk
Radiotherapy (including high energy radiation therapy)	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
Sleep apnoea machine	Acceptable risk
Stereotaxis	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
TENS (Transcutaneous Electrical Nerve Stimulation)	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
Therapeutic ultrasound	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist
TUNA therapy (Transurethral Needle Ablation)	Acceptable risk with precautions – inform your physician that you have an ICD and/or inform your consultant Cardiologist

FURTHER READING

If you want further general information about ICDs, the following websites are good places to visit.

Arrhythmia Alliance (www.heartrhythmcharity.org.uk)

Patient.co.uk (www.patient.co.uk)

National Institute for Health and Care Excellence (www.nice.org.uk)

If you have been diagnosed with a heart condition and need an ICD, the following websites can provide further information.

Arrhythmia Alliance (www.heartrhythmcharity.org.uk)

- Atrial fibrillation
- Brugada syndrome
- Long Q-T syndrome
- Sudden cardiac arrest

British Heart Foundation (www.bhf.org.uk)

- Arrhythmogenic Right Ventricular Cardiomyopathy (ARVC)
- Atrial fibrillation
- Brugada syndrome
- Cardiac arrest
- Catecholaminergic Polymorphic Ventricular Tachycardia (CPVT)
- Dilated Cardiomyopathy
- Hypertrophic Cardiomyopathy
- Long Q-T syndrome
- Progressive Cardiac Conduction Deficit (PCCD)

The Brugada syndrome website (www.brugadadrugs.org) can provide a list of medicines you should avoid when you have Brugada syndrome.

The Cardiac Risk in the Young website (www.c-r-y.org.uk) can provide information on sudden cardiac death in young people.

The Sudden Arrhythmic Death syndrome website (www.sads.org) provides further information on rarer heart conditions which affect the electrical functioning of the heart.

UHSM is not responsible for the quality or accuracy of any information or advice provided by other organisations.

REFERENCES

1. http://www.icd-gloucestershire.org.uk/html/what_is_an_icd.html
2. <http://oliversegal.com/heart-conditions/remote-monitoring/>
3. <http://www.bostonscientific.com/en-US/products/remote-patient-monitoring/latitude.html>
4. <http://health.sjm.com/arrhythmia-answers/daily-life/everyday-concerns-with-an-implantable-device/using-remote-patient-care-management>
5. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/435071/aagv1.pdf
6. <http://www.nice.org.uk/guidance/TA314/chapter/1-guidance>
7. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/435071/aagv1.pdf
8. http://www.gmccsn.nhs.uk/files/8113/6983/8277/ICD_Deactivation_PolicyFinal_V1.0.pdf

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