Information booklet for patients having an Implantable Cardioverter Defibrillator (ICD) or Cardiac Resynchronisation Therapy Defibrillator (CRT-D) at Manchester Foundation Trust (MFT)

Wythenshawe hospital

Speciality	Department	Number
Remote monitor, downloads. Changing Out-Patient appointments	Cardiac Physiologists	0161 291 4615 for appointments 0161 291 4640 for downloads after a shock Limited service at the weekend
Medicines, symptoms, driving licence enquiries, general enquiries	Cardiac Rhythm Management Nurse Team	0161 291 5076
Appointments, driving licence forms	Secretary to Dr Fox/Dr Temple	0161 291 2743
	Secretary to Dr Ainslie/Dr Nikolaidou/Dr Reid	0161 291 2390
	Secretary to Dr Campbell/ Dr Skene/Dr Malhotra	0161 291 2388
	Secretary to Prof Williams	0161 291 2624
	Secretary to Dr Brown/Dr Miller	0161 291 5328
Enquiries about waiting time for procedures	Waiting List co-ordinators Wythenshawe	0161 291 2882 0161 291 4947
Physiotherapy	Cardiac Rehab Wythenshawe	0161 291 2177

Manchester Royal Infirmary (MRI)

Speciality	Department	Number
Remote monitor, downloads. Changing Out- Patient appointments	Cardiac Physiologists	0161 701 7535
Medicines, symptoms, driving licence enquiries, general enquiries	Arrhythmia Nurses	0161 276 4657
Appointments, driving licence forms	Secretary to Dr Zaidi/Dr Pearman Secretary to Dr Muhyaldeen Secretary to Dr Ahmed/ Dr Cunnington	0161 276 66675 0161 276 6183 0161 276 8903
Enquiries about procedure waiting times	Waiting list co-ordinator MRI	0161 701 0727

Examples of ICD

Abbott St Jude

Medtronic

Boston Scientific

Biotronik

Examples of CRT-D

Abbott St Jude

Medtronic

Boston Scientific

Biotronik

INDEX Page No

Section D – Living with your device

Introduction

This booklet has been written to provide information to you and your family about a device called an Implantable Cardioverter Defibrillator (ICD) or a Cardiac Resynchronisation Therapy Defibrillator (CRT-D). These will be referred to as your device throughout this booklet. It explains what your device is, how you are prepared for having a device implanted, your recovery and living with your device at home. Since the COVID 19 pandemic there may be some changes to what is written here.

Section A – The device

What is an ICD?

An ICD is a small slim box which contains a pulse generator, a computer, a battery and either 1 or 2 electrical leads which are attached to your heart muscle. It looks for and treats dangerous, fast heart rhythms if they occur. Your Consultant Cardiologist will decide which ICD is best for you.

The ICD can also act as a pacemaker to beat your heart for you if it goes too slow. Pacemaker beats should be painless. An ICD will deliver a shock to the heart and/or deliver fast pacemaker beats called Anti Tachycardia Pacing (ATP) if it goes into a fast, dangerous heart rhythm. Some people may need an ICD with a built-in special pacemaker, which co-ordinates the heart pumping function. This is called a Cardiac Resynchronisation Therapy Pacemaker or CRT-D. This is discussed later.

Why do I need an ICD?

You have had, or are at risk of having a dangerous, fast heart rhythm. These kind of heart rhythms are life threatening. You can read more about guidelines for having an ICD from the National Institute for Health and Care Excellence (NICE).[1]

There are a few reasons why you need an ICD. Some people are admitted to hospital after they have had a dangerous, fast heartbeat unexpectedly. They may have needed cardio-pulmonary resuscitation (CPR) and were given a shock from a defibrillator. This is called an Out of Hospital Cardiac Arrest (OOHCA). An ICD will usually be implanted before you go home. This can be quite traumatic for some people. There is more information about this further on in this booklet.

Other people may have had investigations and have been found to have a poorly functioning heart pump or short episodes of a dangerous heart rhythm which has made them feel poorly. Others may have been diagnosed with a heart condition such as cardiomyopathy. These people are at risk of having a dangerous, fast heart rhythm.

Will an ICD make me feel better?

No. An ICD only provides treatment for dangerous, fast heartbeats. It will not make you feel better or worse after it has been implanted. It will not stop you from having a heart attack.

What will an ICD do?

An ICD has several functions. It can: -

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

What is a CRT-D?

A CRT-D will do what an ICD does, but it also coordinates how the bottom chambers of the heart (the ventricles) pump the blood around the body. If you have a CRT-D, the pumping strength of the heart is impaired. A CRT-D has either 2 or 3 leads attached to the heart muscle.

Why do I need a CRT-D?

The reasons why you need a CRT-D are the same as for ICD, but your heart pumping strength is impaired. Because the circulation is impaired, this causes an increased risk of dangerous heart rhythms occurring.

Will a CRT-D make me feel better?

It is hoped that a CRT-D will make you feel better but not everyone will feel an improvement in their symptoms. Some people may feel better in a few weeks or months. Others may not feel any improvement for up to a year, or at all.

What will a CRT-D do?

A CRT-D will hopefully improve the symptoms caused by heart failure by coordinating the pumping function of the ventricles. It does this by beating the heart from 2 pacemaker leads, one in each of the ventricles, at the same time. This is usually achieved in conjunction with medications. You will need to take medications to help your heart pump as efficiently as possible and to try to reduce the risk of having a dangerous, life-threatening heart rhythm.

Section B – Preparing to have a device

What are the risks of the procedure?

Implanting these devices are associated with a degree of risks. This includes bleeding or bruising, infection (one to two cases out of a hundred require removal of the entire system), damage to the heart or lung (requiring a drain insertion), inability to site a lead or lead displacement requiring a repeat procedure. There is a small risk of death in less than 1 in 1000 cases. Overall, the procedural risk is 1 in 10.

About 10% of people may have one of the following complications, however almost all the risks listed below are treatable. If one of these complications occurs, this may delay your discharge home, depending on the complication.

- The leads of the device 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 device 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 can form in the brain causing a stroke or in the lungs causing a pulmonary embolism.
- The device 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). You will need a pericardial drain inserted under your breastbone where your ribs join to drain the fluid.
- The doctor may not be able to position the device lead(s) in the correct position.
- There is a very small risk of death, around 1 in 1,000 (0.1%)

How am I prepared for implantation of my device?

You will be contacted by the Waiting List team for the hospital which cares for you. MRI and Wythenshawe may have different methods for bringing you in for your procedure. You will be given information when the Waiting List team contacts you.

Since the implementation of a new computer system at the Trust called Hive, if you have signed up to My MFT, you will be contacted through this and not by letter. You are encouraged to sign up to My MFT, but this is not compulsory.

A letter will be sent to you (either by letter or via your My MFT account) containing details on the date of your procedure, the ward you need to go to, your hospital admission, any instructions and what you need to bring with you. Please read this

letter carefully as it contains important information on when to stop eating and drinking (including chewing gum) and any special instructions you need to follow.

On the day you are admitted, one of the doctors involved in implanting your device will explain the risks and benefits of the procedure, and they will ask you to sign an electronic consent form. If you have any questions about the procedure or its risks and benefits, please ask your doctor at this time. You can also call the Cardiac Rhythm Management (CRM) Nurses at Wythenshawe or the Arrhythmia Nurses at MRI on the telephone numbers at the beginning of this booklet on pages 2/3 and 28. You can seek a second opinion at any time if you wish. The consent form may be signed at your Out-Patients' Appointment (OPA) and/or on the day of your procedure.

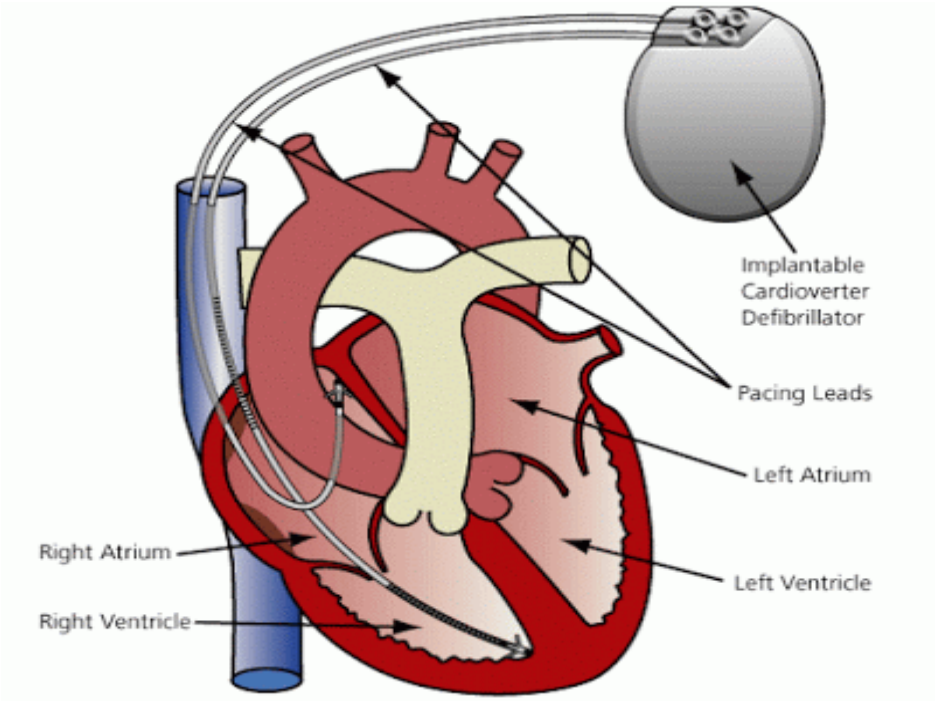
When you come in for the procedure your ward nurse will complete a checklist and prepare you for your procedure. A hollow tube called a cannula will be inserted into your arm so that medicines can be given. Gentlemen with a hairy chest will need to have this shaved to reduce the risk of infection. Your nurse will escort you to the Catheter Laboratory (Cath Lab) recovery area. You will be welcomed by a member of the Cath Lab team who will then ask you some questions to complete the checklist. You may be given an anti-biotic through your cannula as a preventative measure against infections.

How is my device implanted?

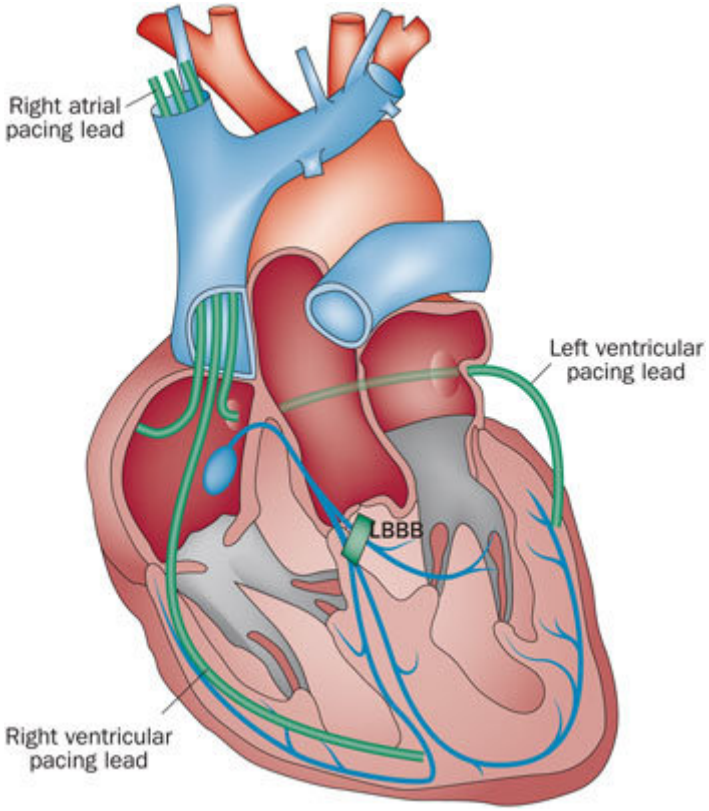
You will be attached to equipment which monitors your heartbeat, blood pressure and oxygen levels. Your upper body will be cleaned with a cold solution and covered with sterile towels so that the risk of infection is minimised. The doctor will inject medicines into your cannula to help you feel relaxed and sleepy. This is called conscious sedation. Most people have conscious sedation. This is not a general anaesthetic (GA), but some people may have a GA if this has been discussed, agreed, and planned previously.

You may also have analgesia in a drip through your cannula (usually paracetamol infusion). Then the skin on your chest is sterilised with a cleaning solution. 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.

Position of an ICD[2]



Position of a CRT-D [2a]



Your doctor will make an incision approximately 3 to 4 centimetres in length underneath your collar bone and create a pocket under the skin. You can see pictures of your device on page 4 and 5. If you are having a sub-pectoral pocket, the doctor will create the pocket under your muscle. A vein will be made accessible so that your doctor can pass 1, 2 or 3 pacing lead(s) into the heart, depending on which device you need. The lead(s) are then attached to the heart muscle.

Once the lead(s) are in place, they will be tested to ensure they are positioned well and are functioning correctly. They will be connected to the device box, which is then placed inside the pocket. The device box contains the computer and battery generator. The wound is then closed with dissolvable sutures underneath your skin and glue is placed on top of your skin.

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

What happens after my device 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. You may need a chest x-ray after the procedure. This will be decided after your device has been implanted.

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 device has been checked by the Cardiac Physiologists. They will provide you with a remote monitor (see page 18) and a device Identification (ID) card. The ID card should always be with you.

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

You may feel some pain and discomfort in the first week or two after your device 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 (under the skin) implant. If you are experiencing severe pain at any time, you should consult your GP or contact the CRM Nurse team (Wythenshawe) or Arrhythmia Nurse team (MRI).

How do I care for my wound at home?

Any dressing should be removed within two days. 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 or two after your procedure. However, if your wound is 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 CRM Nurse/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 clinic earlier than planned to assess your wound. The CRM/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 device.

If your wound opens, and you can see the leads or the battery, you **must go to your nearest hospital straight away**. If this occurs there is an increased risk of infection, and you must seek medical attention on the same day.

How can I help my recovery after my device has been implanted?

It is important that you stay active after your device has been implanted. However, you should take it easy for the first week or two while your wound heals. You can wash, dress, and move around the home as normal on the day after your procedure. Try to avoid lifting your arm on the side of the device 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 a device?

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 you can speak without gasping for breath. Activities where you are working harder than this may not be suitable (for example, 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 CRM Nurse or GP.

Your heart rate will increase when you exert yourself. This is normal. The device 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 device 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 device, 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.

Take care when performing dangerous lone activities such as outdoor swimming or climbing ladders. It will depend 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 a device, speak to you CRM 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 device or its leads. Sports such as golf, tennis and indoor swimming should be played with consideration to your device. You should take care when participating in these sports and try to avoid direct impact to your device 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 device has been implanted?

You should continue to take all the medicines you were taking before your device was implanted unless you have been told otherwise. You can discuss this with your CRM/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 GP 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. Always bring a list of your medicines to every clinic appointment. If you are having a telephone consultation, have the list ready.

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

Name of medicine	Dose	Time taken	What the medicine does

Section D – Living with your device

How am I monitored after my device has been implanted?

You will be monitored on a regular basis after your device has been implanted. If your device was implanted at Wythenshawe, your first Outpatients Appointment (OPA) will be about 6 to 8 weeks after your device was implanted. This will be delivered to your home address or sent to your My MFT account if you have signed up to this service.

If your device was implanted at MRI, you will be reviewed at around 2 weeks after implant. This may be face to face in clinic, or via telephone. This appointment will be delivered to your home address or sent to your My MFT account if you have signed up to this service. 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 (if you don't have My MFT).

This first appointment is important as it gives the team an opportunity to check your wound is healing well, that your device is set at the right settings for you and to interrogate your device for any activity or "therapy" since it was implanted. From then on, you will have regular device checks, either through the remote monitor at home or in clinic. You should be reviewed in your Consultant's clinic once a year. Clinic review may be performed on the telephone or face to face in clinic. You will be reviewed by either the Consultant, Registrar or CRM/Arrhythmia Nurse.

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

Having a device 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 a device implanted. You may feel a sense of security, safety, and reassurance that you have your device which will have a positive impact on your emotional wellbeing.

You may feel sadness, anxiety, anger, a sense of loss, low mood, or vulnerability but it is recommended that you focus on the positive aspects of having your device 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, CRM/Arrhythmia Nurse, ICD Support Group, Cardiac Physiologist, Cardiac Rehabilitation Physiotherapist and GP can also provide support.

If you would like to talk to someone who has a device, call the CRM team at Wythenshawe and we will put you in contact with someone from the Support Group. We will need your permission to provide your name, contact details and a brief outline of your heart condition and concerns. You can speak to someone with a device at any time, providing the service is available. This is currently only available through the CRM Nurse team and all MFT patients can use this service.

What does it feel like to receive a shock?

Everyone will experience a shock differently. Some people barely feel a shock; some describe it as a thump or a kick to the chest and some feel a “sense of impending doom” just before receiving a shock. You may feel intense discomfort when your device 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 device is delivering a shock). You may injure yourself. You may feel minor muscle aches for a short time after. 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. It has just saved your life.
It is also important that you don’t spend your time worrying about the device. Get out and about, enjoy your life and do things which bring you joy and happiness!

What is a remote monitor?

Medtronic
MyCarelink monitor ©

Boston Scientific
Latitude monitor ©

St Jude Merlin monitor ©

Biotronik ©

Medtronic
MyCareLink Heart App

Boston Scientific
MyLatitude App

Abbott St Jude
Merlin@home

Biotronik patient app

A remote monitor is equipment which enables us to monitor your device's activity and life span instead of asking you to come to hospital for an OPA. Remote monitoring equipment is free to you. All new devices now use wireless (Wi-Fi) technology like a mobile phone signal. Wi-Fi signals are used to connect with your device at home and almost all 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 device has given any therapy or shocks. New devices now use an Application (App) on your phone.

Although the above images for device Apps are displayed here, only Medtronic and Abbott St Jude currently have full remote download capability. The Consultant will decide which device is best suited to you.

When you go home, you should set up the remote monitor or the App as instructed by the Cardiac Physiologists. You can follow the guidance in the instruction booklet which you are given and perform a “test download”. This links your device with the remote monitor or App. You should then telephone the Cardiac Physiologists and tell them you have done a test download. This is important because it tells you and us that your remote monitor is ready and working.

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

- Your device can be checked periodically via the remote monitor or App from home. You may be contacted by the Cardiac Physiologists to say they have received an automatic remote monitor download. Your device will then be checked regularly in clinic. This is particularly useful for patients who live a long distance away or have difficulty getting to hospital.
- You can do a download at any time and call the Cardiac Physiologists if you think your device has delivered a shock or ATP therapy. They will examine your download, analyse the results, and advise you. You can also contact your CRM/Arrhythmia Nurse or Cardiac Physiologist for advice if you are not sure what to do.
- You can do a download at any time and call the Cardiac Physiologists if you think you have damaged your device and you have received a shock. A download may detect a loose, broken or “fractured” lead which has confused the device into thinking that you are experiencing a dangerous, fast heart rhythm. This is rare but can occasionally happen if your device has recently been implanted, been damaged or the leads have been inside you 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 device fires/goes off/gives me a shock?

All the above mean the same thing. Your device has delivered a shock to your heart because it has detected a dangerous, fast heart rhythm.

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. You do not need to go to hospital if you have had 1 shock, unless you feel very unwell, and you are not panicking.

If you felt well before the device fired and you feel well afterwards, call your CRM team or Cardiac Physiologist, and let them know. They will advise you on what to do. If you have a remote monitor or App, do a download first, and then call the Cardiac Physiologists. Please bear in mind, these are not emergency 24-hour services, but the answer machines are always on. Leave a message, stating your name, date of birth and hospital number (this starts with 0 or 1 and is unique to you at MFT), or NHS

number with a brief message. We will return your call as soon as possible, although this may not be the same working day.

If you feel very unwell after your device has delivered therapy, call 999 and ask for an ambulance to take you to the nearest Emergency Department (ED). If you come to Wythenshawe hospital or MRI, where your device was implanted, we will "interrogate" your device at the earliest opportunity to see what has happened. Make sure you bring your ID card with you.

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

If you have had more than 1 shock, you should ask someone to drive you to your nearest hospital or dial 999 so you can seek medical attention. Remember, if your device has delivered therapy, 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 device was implanted. You can obtain detailed information from the Driver & Vehicle Licencing Agency (DVLA).[6] If you have had a shock, you must not drive for 6 months. This is the law.

If you **HAVE HAD A SHOCK OR ATP** for a dangerous, fast heart rhythm then you cannot drive for six months.

If you have a device implanted because you are **AT RISK OF HAVING** a dangerous fast heart rhythm, then you cannot drive for one month. The device has been implanted for preventative (prophylactic) reasons.

If you have had an **INAPPROPRIATE SHOCK OR ATP** (ie, the device has given therapy when it should not have done), you cannot drive for 1 month after the problem has been identified and corrected.

If you have a **BOX CHANGE** (there is more about box change later)**,** you cannot drive for 1 week. All the driving restrictions above are legal requirements and driving can resume after the ban providing no therapy has been delivered from your device within the ban time frame and there are no other reasons why you cannot drive.

The CRM/Arrhythmia Nurse team 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. It is your responsibility to inform the DVLA.

This applies for everyone having a device who holds a Group 1 licence (for example if you drive a car or motorcycle). Anyone who holds a Group 2 driving licence (for

example you drive an articulated lorry) can no longer drive a Group 2 vehicle once the device has been implanted and you must inform the DVLA. This is life-long.

Can I do anything to stop my device from firing?

No. Your device 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 you continue to take these medicines, without missing any doses, even if you feel well, 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 device ID card with you and inform any doctor, dentist, or medical/nursing staff that you have a device. Some people also wear a bracelet or neck chain with “I have an ICD/CRT-D” engraved. If you lose/damage your ID card, or change address please call the Cardiac Physiologist for a replacement.

Can my device 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 you receiving a shock, but they will not come to any harm.

Do I need to avoid any electrical equipment now I have a device?

Yes. You can find a more detailed list of items later in this booklet. Please see “**What can I do and not do after my device has been implanted?”** on page 2 and Appendix A on page 31.

You may not be able to have a Magnetic Resonance Imaging (MRI) scan once you have a standard device implanted. However, most of the devices which are now implanted at MFT are “MRI compatible”. This means you can have an MRI scan but the settings on your device need to be altered before and after you have the scan. Therefore, an MRI scan can only take place where there is the facility to check and alter your device at the same time.

You should check if your device is MRI compatible before you leave hospital. When you go to any airport, show your 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 at the entrance.

How long will my device last?

It depends on how active your device has been. Most devices last for approximately six to ten years, give or take a year! Generally, the more shocks a device delivers, the

more battery it uses and the shorter it will last. You will be reviewed regularly, either in clinic or by doing a download at home from your remote monitor or App.

If your battery life is coming to an end the Cardiac Physiologists will monitor your device every three months. You will also be placed on the waiting list to have the battery replaced when your device has around 3 months' battery remaining. This is called a "box change". You can read more about this on page 28. When appropriate, you will be admitted to hospital as a day case to have your battery replaced.

Some devices have a built-in alarm or a vibration device which is activated when the battery is running low. Please ring the Cardiac Physiologist **or** CRM/Arrhythmia Nurse team and they will advise you on what to do if you hear an alarm or vibration coming from inside you. We may ask you to do a download or arrange to bring you to clinic to switch the alarm off while you are waiting for your box change. We may also demonstrate what this feels like when you are in clinic, so you know what to do if you hear an alarm or vibration.

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

All devices have a protective shield so most items which you encounter will not affect the normal functioning of your device. 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 device.

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

When your device comes into contact with an electro-magnetic field there is a risk that your device will deliver a shock when it is not needed or withholds a therapy (a shock or ATP) when it is needed. It is recommended that you only use equipment in good working order and at a specified minimum distance from your device.

If you feel dizziness, light-headedness, palpitations, chest discomfort, changes in your heartbeat 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 device. If you still feel unwell after removing yourself from the electromagnetic field, you should contact the Cardiac Physiologists or the CRM/Arrhythmia Nurse team as soon as possible. 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 on page 31.

They are listed in categories:

- Household and hobbies
- Tools and industrial equipment
- Communications and office equipment
- Medical and dental procedures.

Can I have cardiac rehabilitation (cardiac rehab) after my device has been implanted?

Yes, you can! Cardiac rehab is an important part of your recovery. People who have had a heart attack or who have heart failure and need a device afterwards are already offered cardiac rehab. If your device is implanted because you have had an OOHCA or are at risk of having dangerous, fast heart rhythms, you can also have cardiac rehab.

After your device has been implanted you may be asked if you would like cardiac rehab. You will then be referred to your nearest programme. If your local hospital does not offer cardiac rehab, you can have one session at Wythenshawe hospital or at MRI. You can find a list of the cardiac rehab providers at cardiac-rehab.net[7]. You will be assessed by a member of the cardiac rehab team and a programme of physical activity, exercise, education, good lifestyle practices and psychological support will be devised dependent on your individual goals and diagnosis.

Is there a support group for people who have a device?

Yes, there is.

Wythenshawe ICD Patients Support Group[8] was set up in 2001 at Wythenshawe hospital to provide communication, education, and support for patients with ICDs. There is a Chairman, Secretary, Treasurer, and committee members, all of whom have or have had an ICD or CRT-D implanted. They now support patients with a CRT-D also.

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

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

Wythenshawe hospital also has a team of male and female patient volunteers, all of whom have or have had a device. In their spare time they will chat to new patients who have or need a device when required. This can be done either by telephone, email, or face to face if it is safe to do so. Face to face meetings must be agreed by both the patient and the volunteer.

The volunteer will offer support and will share their experiences of living with a device. You can ask the CRM Nurse team if you would like to speak to a volunteer. Volunteers cannot offer medical advice but are a great source of support and advice on living with a device. This can only be arranged by the CRM Nurse team at Wythenshawe.

The ICD Support Group is completely funded by donations which are always gratefully received. If you would like to contribute towards the newsletter, please contact the Chairman or the Treasurer of the Committee. Their details can be found on every newsletter and on the website. Further details are below. Any patient who is looked after by MFT can attend patient meetings and there are plans to develop the newsletter into an online format only.

If you move to a new house or if the person who receives the Defibber News has passed away, please let us know. You can call the CRM Nurse team or the Cardiac Physiologists at your hospital on the numbers at the front of this booklet or on page 27/28.

The Support Group also has a website. Go to Google, type in Patients | Icdsupport (wythenshaweicdsupportgroup.uk). You can also find the website by typing in Wythenshawe ICD Support Group. On here you can find information on past newsletters, details of the next device Support Group meeting, important contact numbers, the Committee members, and your type of device. You can also find this booklet if you lose it!

If you would like to be a member of the Support Group Committee, please contact the CRM Nurse team at Wythenshawe to register your interest.

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 other's 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.

You can also talk to the CRM/Arrhythmia Nurse team in strict confidence if you need support or advice.

What if I want to deactivate my device?

To deactivate a device means turning off the shock lead of your device. This may also be called reprogramming of the device. You can choose to have the shock lead switched off. If the shock lead is switched off, your device will no longer monitor for and treat dangerous, fast heart rhythms. There are several reasons why you might want your device 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 last stage of your life.
- You no longer wish for a device to be part of your care and treatment.

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

Deactivating the shock lead of a device 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[9]. The process of deactivating any part of your device is quick, totally painless, and completely reversible. All functions can be switched back on again at any time in your life.

You may feel uncomfortable discussing deactivation/reprogramming of your device 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. 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 device will remove the possibility of receiving a shock or ATP therapy which may cause you pain and distress in your final hours or days. However, the device will not treat these rhythms which are life threatening. The pacemaker part of your device will still function.

The action of deactivating a device will neither bring about death, nor prolong life.

What happens when the decision has been made to deactivate/reprogramme my device?

There needs to be a discussion with you, the important person in your life (if you wish for them to be involved in the discussion), and your Consultant Cardiologist before we do any alteration of your device. Whenever possible, this should take place before you become too unwell to travel to the hospital.

This discussion should take place at a clinic consultation, face to face with your Consultant Cardiologist. Your Consultant needs to make sure you understand the implications and benefits of deactivating/reprogramming your device and that you fully understand that once the device has been deactivated/reprogrammed, it will no longer treat the dangerous, life-threatening heart rhythms if they occur.

You will then be asked to complete a consent form, so the device can be deactivated/reprogrammed. This will likely be done at the same clinic consultation unless you want more time to discuss the decision with your significant others.

Once the decision is made, you will be taken to the Cardiac Physiologists room, where you had your usual device checks previously, and the device will be deactivated/reprogrammed. It takes 5-10 minutes to do this. You will then be able to go home. The Consultant will write to you, your GP, and everyone involved in your care to inform them that your device has been deactivated/reprogrammed.

If you wish, the remote monitor can still be used to check your device instead of coming to the hospital for device checks. Once you have passed away, your family should call us to let us know as soon as they are ready. We will remove your name from the Defibber newsletter mailing list. Occasionally, we do not know a patient has passed away and the newsletter is inadvertently sent. We try to avoid this as it can be upsetting for your family to receive the newsletter after you have passed away.

Most of the remote monitors can be recycled, so your family can bring this to the Cardiac Diagnostics department as soon as it is convenient.

How is my box changed?

When the battery is close to being depleted, you will be admitted to hospital to have a “box change”. There are systems in place to ensure your battery never becomes completely depleted. In the extremely rare circumstance that your battery is completely depleted, you will be admitted to hospital straight away to have the battery renewed.

A box change does not usually require an overnight stay unless there are exceptional circumstances. If you do need to stay overnight, please discuss this with your Consultant Cardiologist or at your Pre-Op appointment. MRI patients will need to have their procedure at Wythenshawe if they need an overnight stay. This must be discussed and agreed at the earliest opportunity.

The wound is cleaned and made numb just like when it was first implanted. The wound is opened up and the battery of the device is freed from the pocket. A new battery is connected to the lead(s). The lead(s) are checked to ensure they are working well,

and the wound is stitched back up using dissolvable sutures. Glue is placed over the skin and a dry dressing is applied.

Occasionally, a tight bandage is applied to reduce the risk of bleeding or if a collection of blood (haematoma) has formed under the skin. You will be given instructions about this if a pressure bandage is required. You will be given further information on care of your wound when you are discharged.

Who do I call if I need help?

Wythenshawe patients

SPECIALITY	DEPARTMENT	NUMBER
Remote monitor, downloads Outpatient appointments	Cardiac Physiologists	0161 291 4615 for downloads 0161 291 4640 for appointments Limited service at the weekend
Medicines, symptoms, driving licence enquiries, general enquiries	CRM Team	0161 291 5998 0161 291 5443 0161 291 5076
Appointments, driving licence forms	Secretary to Dr Fox	0161 291 2743
	Secretary to Dr Ainsle/Dr Schmitt/Dr Reid	0161 291 2390
	Secretary to Dr Campbell/ Dr Skene	0161 291 2388
	Secretary to Dr Williams	0161 291 2624
	Secretary to Dr Brown/ Dr Temple/Dr Nikolaidou	0161291 4152
Enquiries about waiting time for procedures.	Waiting List co-ordinators Wythenshawe hospital	0161 291 2882 0161 291 4947
Physiotherapy Wythenshawe	Cardiac Rehab	0161 291 2177

MRI patients

SPECIALITY	DEPARTMENT	NUMBER
Remote monitor, downloads. Changing Out- Patient appointments	Cardiac Physiologists	01617017535
Medicines, symptoms, driving licence enquiries, general enquiries	Arrhythmia Nurses	01612764657
Appointments, driving licence forms	Secretary to Dr Zaidi/Dr Pearman Secretary to Dr Muhyaldeen Secretary to Dr Ahmed/ Dr Cunnington	016127666675 01612766183 01612768903
Enquiries about procedure waiting times	Waiting list co-ordinator MRI	01617010727

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 (cm) from device
Back massager handheld	Minimal risk – maintain at least six inches or 15 cm from device
Battery powered shaver	No known risk
Car/motorcycle components of ignition system	Special consideration – maintain at least 12 inches or 30 cm from device
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 cm from device
Corded electric shaver	Minimal risk – maintain at least six inches or 15 cm from device
Dishwasher	No known risk
Electric blanket	No known risk
Electric fence	Special consideration – maintain at least 12 inches or 30 cm from device
Electric grocery cart motor	Minimal risk – maintain at least six inches or 15 cm from device
Electric guitar	No known risk
Electric pet containment fence – buried wire and indoor antenna	Special consideration – maintain at least 12 inches or 30 cm from device
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 15 cm from device

Green transformer box in yard	Special consideration – maintain at least 12 inches or 30 cm from device
Hair drier – handheld	Minimal risk – maintain at least six inches or 15 cm from device
Handheld kitchen appliances (electric mixer, knife)	Minimal risk – maintain at least six inches or 15 cm from device
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 cm from device
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 cm from device
Magnetic mattress pad/pillow	Not recommended
Magnetic therapy products	Minimal risk – maintain at least six inches or 15 cm from device
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 cm from device
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 cm from device
Speakers	Minimal risk – maintain at least six inches or 15 cm from device
Tanning bed	No known risk
Television	No known risk

Treadmill motor	Minimal risk – maintain at least six inches or 15 cm from device
Ultrasonic pest controller	Minimal risk – maintain at least six inches or 15 cm from device
Vacuum cleaner motor	Minimal risk – maintain at least six inches or 15 cm from device

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 cm from device
Callipers (battery powered)	No known risk
Circular saw	Minimal risk – maintain at least six inches or 15 cm from device
Drill press	Special consideration – maintain at least two feet or 60 cm from device
Drills (battery and electric powered)	Minimal risk – maintain at least six inches or 15 cm from device
Electric chainsaw	Minimal risk – maintain at least six inches or 15 cm from device
Flashlight	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 cm from device
Generators with 20 kW or less	Special consideration – maintain at least 12 inches or 30 cm from device
Grinder	Special consideration – maintain at least two feet or 60 cm from device
Grinder (handheld)	Minimal risk – maintain at least six inches or 15 cm from device
Hedge trimmer – electric powered	Minimal risk – maintain at least six inches or 15 cm from device
Jumper cables	Special consideration – maintain at least two feet or 60 cm from device
Laser level	No known risk
Pressure washer	Special consideration – maintain at least two feet or 60 cm from device
Sander	Minimal risk – maintain at least six inches or 15 cm from device

Screwdriver (battery powered)	Minimal risk – maintain at least six inches or 15 cm from device
Soldering gun	Minimal risk – maintain at least six inches or 15 cm from device
Soldering iron	No known risk
Stud finder	No known risk
Table saw	Special consideration – maintain at least two feet or 60 cm from device
Weed whacker (electric powered)	Minimal risk – maintain at least six inches or 15 cm from device
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 cm from device

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

ITEM	**RECOMMENDATION**
Amateur radio	Minimal risk – maintain at least six inches or 15 cm from device
Amateur radio (3 to 15 watts) from antenna	Special consideration – maintain at least 12 inches or 30 cm from device
Bluetooth technology	Minimal risk – maintain at least six inches or 15 cm from device
Computers	Minimal risk – maintain at least six inches or 15 cm from device
Cordless headphone sending unit (TV ears)	Minimal risk – maintain at least six inches or 15 cm from device
E readers (Kindle)	Minimal risk – maintain at least six inches or 15 cm from device
E tablets (iPad)	Minimal risk – maintain at least six inches or 15 cm from device
Fax machine	No known risk
Global Positioning Machine (GPS)	No known risk
Ham radio	Minimal risk – maintain at least six inches or 15 cm from device
Ham radio (15 to 30 watts) from antenna	Special consideration – maintain two

	feet or 60 cm from device
Ham radio (3 to 15 watts) from antenna	Special consideration – maintain at least 12 inches or 30 cm from device
Headsets	Minimal risk – maintain at least six inches or 15 cm from device
Home wireless electronics – from antenna	Minimal risk – maintain at least six inches or 15 cm from device
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 cm from device
Laptop/computer	No known risk
Marine radio	Minimal risk – maintain at least six inches or 15 cm from device
Marine radio (15 to 30 watts) from antenna	Special consideration – maintain at least 12 inches or 30 cm from device
Marine radio (3 to 15 watts) from antenna	Special consideration – maintain at least 12 inches or 30 cm from device
Mobile phone three watts or less – from antenna	Minimal risk – maintain at least six inches or 15 cm from device
Modems	Minimal risk – maintain at least six inches or 15 cm from device
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 cm from device
Remote keyless entry	Minimal risk – maintain at least six inches or 15 cm from device
Routers	Minimal risk – maintain at least six inches or 15 cm from device
Scanner	No known risk

Security badge wall scanner	Minimal risk – maintain at least six inches or 15 cm from device
Smart meters (utility companies)	Minimal risk – maintain at least six inches or 15 cm from device
Smart phones	Minimal risk – maintain at least six inches or 15 cm from device
Walkie talkie (15 to 30 watts) from antenna	Special consideration – maintain at least 12 inches or 30 cm from device
Walkie talkie (3 to 15 watts) from antenna	Special consideration – maintain at least 12 inches or 30 cm from device
Walkie talkie three watts or less – from antenna	Minimal risk – maintain at least six inches or 15 cm from device
Wireless communication devices (computers, modems, routers, headsets, smart phones, Bluetooth)	Minimal risk – maintain at least six inches or 15 cm from device
Wireless controllers (video game consoles)	Minimal risk – maintain at least six inches or 15 cm from device

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

ITEM	**RECOMMENDATION**
Acupuncture – no electrical stimulus	Acceptable risk
Acupuncture with electrical stimulus	Acceptable risk with precautions – tell your physician that you have a device and/or inform your consultant /cardiologist
AED (Automated External Defibrillator)	Acceptable risk with precautions – tell your physician that you have a device 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 – tell your physician that you have a device 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 – tell your physician that you have a device and/or inform your consultant Cardiologist
CT (Computerised Axial Tomography) scan	Acceptable risk with precautions – tell your physician that you have a device 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 – tell your physician that you have a device and/or inform your consultant Cardiologist
ECG (electro-cardiograph)	Acceptable risk
Echocardiogram	Acceptable risk
Elective cardioversion	Acceptable risk with precautions – tell your physician that you have a device and/or inform your consultant Cardiologist
Electrolysis	Acceptable risk with precautions – tell your physician that you have a device and/or inform your consultant Cardiologist
External defibrillation	Acceptable risk with precautions – tell your physician that you have a device and/or inform your consultant Cardiologist
Fluoroscopy (diagnostic x-rays)	Acceptable risk
HBOT (Hyperbaric Oxygen Therapy)	Acceptable risk with precautions – tell your physician that you have a device 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 – tell your physician that you have a device and/or inform your consultant Cardiologist
Mammogram	Acceptable risk
MRI (Magnetic resonance Imaging) scan with standard ICD implanted	Not recommended if device is not MRI compatible
MRI scan with MRI compatible device implanted	Inform your consultant Cardiologist and Cardiac Physiologist so that device settings can be adjusted immediately prior to and after MRI scan
Muscle stimulators and other devices sending current into your body	Acceptable risk with precautions – tell your physician that you have a device and/or inform your consultant Cardiologist
NMES (Neuro Muscular Electrical Stimulation)	Acceptable risk with precautions – tell your physician that you have a device and/or inform your consultant Cardiologist
PET scan (positron Emission Tomography)	Acceptable risk
PH capsules	Acceptable risk
Radiotherapy (including high energy radiation therapy	Acceptable risk with precautions – tell your physician that you have a device and/or inform your consultant Cardiologist
Sleep apnoea machine	Acceptable risk
Stereotaxis	Acceptable risk with precautions – tell your physician that you have a device and/or inform your consultant Cardiologist
TENS (Transcutaneous Electrical Nerve Stimulation)	Acceptable risk with precautions – tell your physician that you have a device and/or inform your consultant Cardiologist
Therapeutic ultrasound	Acceptable risk with precautions – tell your physician that you have a device and/or inform your consultant Cardiologist
TUNA therapy (Transurethral Needle Ablation	Acceptable risk with precautions – tell your physician that you have a device

	and/or inform your consultant Cardiologist

FURTHER READING

If you want further information about devices and heart conditions, 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 a device, 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
- Heart failure
- 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.
Wythenshawe hospital is not responsible for the quality or accuracy of any information or advice provided by other organisations.

REFERENCES

1. https://www.nice.org.uk/guidance/ta314/chapter/1-Guidance
2. http://www.azheartrhythmcenter.com/procedures/defibrillation-implantation

   2.a https://hospital.nhsgoldenjubilee.co.uk/application/files/4116/5642/4599/Cardiac_Resynchronisation_Therapy_Defibrillator_CRT-D_v6.pdf
3. http://www.medtronic.com/us-en/patients/treatments-therapies/remote-monitoring.html
4. http://www.bostonscientific.com/en-US/products/remote-patient-monitoring/latitude.html
5. https://www.sjmglobal.com/en-int/patients/arrhythmias/our-solutions/remote-monitoring
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9. http://www.gmccsn.nhs.uk/files/8113/6983/8277/ICD_Deactivation_PolicyFinal_V1.0.pdf

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