

Patient/Family Material

Implantable Cardioverter Defibrillator and Cardiac Resynchronization Therapy Implantation

A guide for patients and families



Hôpital St-Boniface Hospital

Prepared by Cardiac Sciences Program
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Patient checklist

This checklist will help you prepare for your implantable cardioverter defibrillator (ICD) or cardiac resynchronization therapy defibrillator (CRT-D) implant.

Before your implant:

- Fill out the medication list at the back of this booklet and bring it with you to your appointments.
- Bring all of your medications in their original pharmacy package or bubble pack. On the day of your implant you will be taking your own medications while at the hospital.

On the day of your implant:

- Do not eat or drink anything after midnight.
- Remove all nail polish and do not wear any makeup.
- Do not take any medications on the morning of the implant, unless a doctor or nurse from our clinic has told you that it is okay to take it.

Medication	When to stop

Bring these items with you to the hospital:

- your health card
- all of your medications in their original packages
- the name and phone number of your emergency contact person
- a list of your allergies
- your CPAP or BiPAP machine
- name of family doctor and following cardiologist

Leave these items at home:

- All valuables. This includes money, jewellery, mobile phones and other personal electronic devices. St Boniface Hospital is not responsible for the loss of or any damage to personal property.

Plan for your discharge:

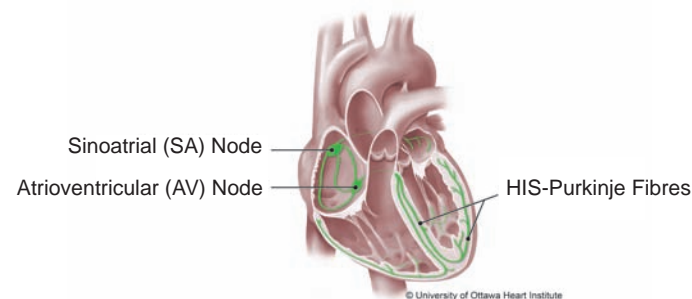
- You CANNOT drive yourself home. You must arrange for someone to drive you home.
- You will not be able to drive for at least 1 month after your implant. Refer to the Driving section on page 12 for more information.
- Arrange for someone to stay with you during your first night home from the hospital
- If you live more than an hour and a half from St Boniface Hospital or more than 30 minutes from an emergency department, you will need to make arrangements to stay in Winnipeg for your first night after discharge.

About Implantable Cardioverter Defibrillators and Cardiac Resynchronization Therapy Defibrillators

The Heart's Electrical System

Your heart is a muscle that works like a pump. The main job of your heart is to pump blood throughout your body. The heart has a right side and a left side. Each side has an upper chamber, or atrium, which collects blood returning to the heart and a muscular lower chamber, or ventricle, which pumps the blood away from the heart. The pumping of your heart is controlled by an electrical current, or impulse. The impulse starts in the sinoatrial (SA) node. It then spreads through both atria and causes them to contract, squeezing blood into the ventricles.

The impulse then travels down to the atrioventricular (AV) node. The AV node splits into two branches and travels to the bottom of the ventricles at the same time. This lets your heart pump effectively.



Heart Arrhythmias

An arrhythmia is when your heart does not beat in a normal rhythm. Tachyarrhythmia occurs when the heart beats too fast. There are two types which are often referred to as ventricular tachycardia (VT) and ventricular fibrillation (VF) are the most common fast heart beats that these devices treat.

Bradyarrhythmia occurs when the heart beats too slowly.

Arrhythmias are very common and usually do not cause problems. In rare cases they can cause you to become dizzy or very tired.

Implantable Cardioverter Defibrillators (ICDs)

An ICD is a device that is placed under the skin, below your collarbone and is designed to detect harmful heart rhythms. When an ICD detects an abnormal, rapid heart rhythm it can do one of two things:

- The ICD takes over pacing your heart for a short time (anti-tachycardia pacing) or
- The ICD gives you a shock to correct the rhythm (defibrillation).

An ICD can also detect if your heart is beating too slowly and will act like a pacemaker, by sending electrical signals to the heart muscle to help your heart beat at a more normal rate.

There are two reasons why people need ICDs. You have either had a harmful abnormal heart rhythm or you are at risk of having one. You should refer to your device as an ICD and NOT a pacemaker. While all defibrillators are able to pace your heart, the two devices are very different and need to be treated differently.

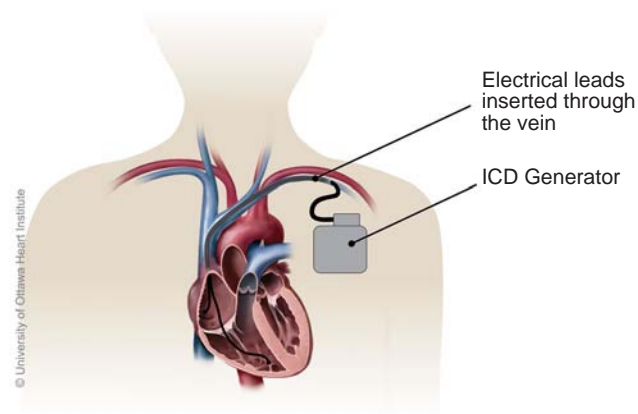
Cardiac Resynchronization Therapy Defibrillator (CRT-D)

A CRT-D device is an ICD designed for people with heart failure. It causes both sides of the heart to beat more efficiently. CRT-D devices have an extra lead that goes into the left side of the heart. A CRT-D device is able to both pace and shock your heart just like an ICD.

Parts of an ICD or CRT-D

The ICD or CRT-D has two basic parts: the generator (sometimes called the battery) and one or more wires, called leads. The generator contains the battery, wiring and a computer that make the ICD or CRT-D work properly. The generator can be programmed to detect harmful heart rhythms. The leads are special wires that connect on one end to the generator and the other end is attached to a spot inside your heart.

You will receive a temporary identification card with your device and lead information. A permanent one will be mailed to you in the coming months. You must keep this card in your wallet.



In general, ICDs and CRT-Ds are implanted on the left side of the chest, just below the collarbone.

How the ICD or CRT-D Works

When the generator senses abnormal heart rhythms, it sends out either pacing pulses, or an electric shock to the heart through the leads. Your device does not prevent the abnormal rhythm from happening but it tries to correct the abnormal rhythm as it happens. Your device will store information about your heart's electrical activity which is checked when you visit the Pacemaker / Defibrillator Clinic.

Anti-Tachycardia Pacing (ATP)

When the ICD or CRT-D senses an abnormally fast heart rhythm, the device tries to pace the heart at a faster rate than the heart is going on its own. Doing this can stop the abnormal heart rhythm and allow your SA node to act as the pacemaker of the heart. You usually do not feel anything when this happens.

Defibrillation

For abnormal heart rhythms that are extremely fast, or if ATP does not work, the ICD or CRT-D will give a shock to the heart. This works just like if pads are put on the chest and a shock is given by medical personnel. Your device uses a smaller amount of energy because it is attached right to the heart muscle. Some patients describe the feeling as a small thump in the chest while others have a strong, uncomfortable feeling like being kicked in the chest. Anyone touching you when you get a shock may feel a slight tingling sensation but will not get a shock or be harmed in any way.

Bradycardia Pacing

If your heart beats too slowly, the ICD or CRT-D can act like a pacemaker and stimulate your heart to beat at a healthy rate. Most people will not feel anything when this happens.

Preparing for your ICD or CRT-D implant

ICDs and CRT-D are put in by cardiologists who specialize in the electrical system of the heart. This speciality is called electrophysiology. These doctors all work as a team to care for all the patients who need these implants. This means that the doctor who you see in clinic may not be the doctor who will put in your device.

Before your procedure

Please use the patient checklist on page 2 - 3 to help you prepare for your ICD or CRT-D implant.

Day of ICD or CRT-D implant

- Plan to arrive at the hospital using the instructions you received. You do not have to arrive early as the time we have given you takes into account the time we need to get you ready.
- You will check in to the Patient Registration desk on the second floor of Y2 Bergen Centre. This is the same desk as the Pacemaker/ Defibrillator Clinic. Take the elevators from the Emergency Department entrance up to the second floor and turn right through a doorway.
- After you check in, you will go to the Pre and Post Procedure area and stay there until you are ready to go in for your ICD or CRT-D implant.
- Once you are in the Pre and Post Procedure area, you will change into a hospital gown and your chest will be clipped and scrubbed with a cold cleaning solution. You will have a chance to use a toilet. An intravenous (IV) will be placed in your arm. You will get an antibiotic to prevent infections and this IV will be used during the implant to give you medications to keep you comfortable.
- The implant will occur in a special room called the Procedure Lab. The doctor who will put in your device will come and meet you in the Pre and Post Procedure area. This is a good time to ask any final questions before you read and sign the consent for the ICD or CRT-D.

- ❑ Only one friend or relative will be able to wait with you in the Pre and Post Procedure area because space is limited. Your other support people can wait in the clinic waiting room. Once you are back in the Pre and Post Procedure area the staff will call your one friend or relative back in to wait with you until you go home or go to the overnight area.

In the Procedure Lab

- ❑ The doctor, nurses and x-ray technologist are some of the team members needed to put in your device. All staff will be wearing gowns, masks, hats and lead aprons.
- ❑ Your chest will be washed again with the cold cleaning solution and sterile sheets will be placed over you. It is important that you do not touch the top of the sheets once they are in place. Tell the nurse if you have any concerns during the implant and the nurse will be able to assist you.
- ❑ You will receive medications through your IV to help you relax, and you may even sleep lightly. You will also receive pain medications through your IV as needed.
- ❑ Freezing will be given to numb the area below your collarbone, where the generator will be put in. This may sting or burn for a short time.
- ❑ Once the freezing has taken effect the doctor will make a small cut. The ICD or CRT-D leads will be threaded through veins to the heart, guided by a special X-ray. This is not painful but you may feel some pressure as the veins are entered. The generator is then placed just under the skin. Tell the nurse if you have any pain or concerns. It is important that you stay very still during the implant.

- ❑ Once the device is in, the cut will be stitched closed. These stitches do not need to be removed as they will dissolve on their own. Steri-strips and a small dressing will be placed over top and an even larger dressing may be put on top of that.
- ❑ The whole procedure takes about 2-4 hours to complete; yours may take longer or shorter.

After Your Implant

- ❑ We will take you back to the Pre and Post Procedure area on a stretcher.
- ❑ You will be hooked up to a heart monitor that will show your heart rate and blood pressure. You will have a chest x-ray to check your ICD or CRT-D placement. You will also have an electrocardiogram (ECG) done.
- ❑ A nurse from the Pacemaker / Defibrillator Clinic will come see you to check how your device is working by placing a wand on your chest. It does not hurt when your device is checked.
- ❑ You may feel some pain at the site where your ICD or CRT-D was put in. If you feel pain, tell your nurse and we can change your position and give you pain medication to make you more comfortable.
- ❑ You can eat and drink normally when you return to the Pre and Post Procedure area. Your nurse will help you as needed and can bring you something to drink and a light snack.
- ❑ It is important not to raise your arm on the side of the ICD or CRT-D implant above your head or lift anything that is more than 5 lbs for the first 4 weeks. Doing this can move the leads away from your heart wall and may cause your device to not work properly.
- ❑ You may experience bruising or color changes in your skin around the implant site. If you were on a blood thinner before the procedure this may be more noticeable.

Discharge and Follow-up Care

Once you are feeling better, have eaten, and walked, you may be able to go home. Some people have to stay at the hospital overnight. We will tell you if you need to stay the night before we put in your device.

The nurse will teach you how to care for the insertion site before you go home. The doctor will go over any medication changes with you. The doctor will also tell you about when you can drive again and when you can return to work.

Before you go home, your IV will be removed and you will be taken off the heart monitor.

Discharge checklist

- Medication changes _____
- Activity over the next few weeks _____
- Driving restrictions _____
- Return to work _____

Caring for Your Insertion Site

- If there is a large dressing or a pressure dressing, it is to be removed after 2 days (48 hours).
- Leave the smaller bandage on for 5 days and keep it dry.
- You cannot shower with the outer bandage on, but you can take a bath if you make sure the bandage stays dry.
- You may shower when the outer bandage comes off, but do not soak your implant site under water until after your first check-up.
- Do not rub soap across the insertion site for 10 days. Do not use lotions or cream on the implant site.
- The steri-strips that cover the implant site can be left on until they fall off. This can take 2-4 weeks. The stitches under the skin will dissolve on their own.

When to call the Pacemaker / Defibrillator Clinic

- Your wound swells, bulges, drains fluid, turns red or feels hot to touch.
- You have swelling or pain in the arm or hand on the side of the device.
- You have a fever and one of the symptoms above.
- If you have any concerns about your device.

**The Pacemaker / Defibrillator Clinic is open
Monday- Friday 8:00 am- 4:00 pm
204-237-2431**

**Outside of these hours please go to your local
emergency department or health care facility**

**IF YOU FEEL VERY DIZZY OR FAINT, HAVE SOMEONE
TAKE YOU TO YOUR NEAREST EMERGENCY ROOM OR
LOCAL HEALTH CARE FACILITY**

Activity Guidelines

- Do not lift your arm on the same side that the ICD or CRT-D was put in above your head for 4 weeks.
- Do not lift anything more than 5 pounds or pull heavy objects with this arm for 4 weeks.
- Avoid arm movements like vacuuming and shoveling for 4 weeks.
- You can slowly increase your activity to the level you were at before your implant.
- Avoid swimming, golfing, tennis and contact sports for 4-6 weeks.
- Your device should not deliver therapy for the natural increase in heart rate with physical or sexual activity, but has on occasion.
- Sexual activity can be resumed when you are comfortable and can walk up two flights of stairs. Sexual activity requires the same exertion as walking up two flights of stairs. If your device gives you a shock during sexual activity, your partner may feel a tingling but it will not hurt your partner.

Driving

Your doctor will discuss with you how long you have to wait to drive. This depends on the type of device you had put in and why you needed that device. Most people have to wait at least 1 month to drive again. Manitoba Public Insurance has rules your doctor has to follow about driving after getting an ICD or CRT-D.

Medications

You may be given a prescription for pain medication to use as needed. You should take your usual medications unless you were told you should not.

What To Do If You Feel A Shock

HAVE SOMEONE TAKE YOU TO THE NEAREST EMERGENCY ROOM OR LOCAL HEALTH CARE FACILITY IF:

- You receive a shock and **CONTINUE TO FEEL:**
 - Chest pain
 - Palpitations
 - Short of breath
 - Dizzy
- Your symptoms get worse
- You receive multiple shocks
- **DO NOT DRIVE YOURSELF**

****Ask that any reports or tests be faxed to the Pacemaker/ Defibrillator Clinic at 204-231-2541****

CALL THE PACEMAKER / DEFIBRILLATOR CLINIC THE NEXT BUSINESS DAY IF:

- You receive a shock and **DO NOT CONTINUE TO FEEL:**
 - Chest pain
 - Palpitations
 - Short of breath
 - Dizzy
- your symptoms improve
- you receive only one shock

**The Pacemaker / Defibrillator Clinic is open
Monday- Friday 8:00 am- 4:00 pm
204-237-2431**

Because a shock can be sudden and unexpected, it is normal to feel upset or anxious afterwards.

Living With Your ICD or CRT-D

Follow-up in the Pacemaker / Defibrillator Clinic

- Each time you come to the Pacemaker / Defibrillator Clinic, you will be seen by a nurse who will test your ICD or CRT-D and make sure the settings are the best for you.
- When it is needed, a cardiologist will be asked to see you about your ICD or CRT-D or your heart rhythm.
- How often you come to clinic will depend on many factors. At the end of each visit, we will tell you when you need to return for your next appointment.
- Your family doctor and cardiologist will receive updates on your visits as needed.
- Please bring a current list of medications with you to every appointment.
- Please adhere to schedule of appointments as best as you can.
- No reminder phone calls are made prior to appointments. Make sure you write down your appointment dates and times.

The ICD Support Group of Manitoba

The goal of the group is to provide support, education and the opportunity for ICD patients and their families to speak with others who also have an ICD. The support group has regular meetings in a caring and friendly environment. These volunteers share their personal experiences and have many helpful hints to deal with living with an ICD. There are also regular newsletters provided to group members. More information, including contact information, can be found on their website, www.icdsupportgroupofmanitoba.com.

Adjusting to an ICD or CRT-D Implant

Even though your implant may save your life, some people need time to adjust and to feel normal again. Some people report feeling scared, angry, depressed, and even denial about their device. These feelings should pass with time. Let us know if you are having trouble adjusting to having your device.

Some things may help you accept your device in a positive way:

- Get as much information as you need about your device. This will help you feel more in control.
- Understand that any emotions that you are feeling are normal and talking about them is a healthy way to cope.
- Talk to other people who have had ICD or CRT-D implants. Listening to their experiences will give you ideas as you adjust to the device. The ICD Support Group of Manitoba is the best resource for this.
- Plan on a gradual return to your normal activities. This will help build your confidence.

Surgery and Medical Procedures

It is rare but some medical equipment may affect the function of your device. It is important to tell your doctor, dentist or any technician that you have an ICD or CRT-D well before you have any surgery, medical or dental procedure. **You should refer to your device as an ICD or CRT-D and NOT a pacemaker**, as defibrillators need to be treated differently during medical or surgical procedures. The medical personnel may wish to contact the Pacemaker / Defibrillator Clinic before your procedure to ensure proper functioning during and after your procedure.

You should always carry your ICD or CRT-D wallet card with you along with a complete list of medications you are taking. See page 17 for information about MedicAlert bracelets.

Things to Avoid

- Magnetic Resonance Imaging (MRI): This test uses strong electromagnetic fields that could turn off your device. Some newer ICD or CRT-D models are “MRI-conditional” however this test should still be avoided. Do not go into a room with a MRI machine.
- Diathermy: This treatment often used by physiotherapists has electric currents and could interfere with your device.

- ❑ Electrocautery: Is used during surgery to stop bleeding. It can be used if your device's shocking function is turned off during surgery.
- ❑ Lithotripsy: This is a procedure where stones (i.e. kidney stones) are removed. Your device may need to be reprogrammed for this procedure.
- ❑ Anti-theft devices: These are found in doorways of some stores. You may walk through them but do not linger in the doorway.

Welding

Welding produces intense electric and magnetic interference which may interrupt the function of your device. After your implant, you should not perform or go near electric welding until you have discussed this with your cardiologist. Welding interference will not permanently damage the ICD or CRT-D but it can interfere with its function.

If your cardiologist approves you welding, you must follow these precautions. These precautions are intended only for conventional electric welding. Welders over 400 amps, automated spot welders, r-f welders, induction welders and similar industrial equipment require additional precautions. Let your cardiologist know you need more information about these if you use them.

- ❑ Use acetylene or other non-electric welding when possible.
- ❑ Wear non-conductive gloves like dry leather, fireproof cloth or rubber gloves.
- ❑ Wear dry shoes.
- ❑ Do not work in wet or damp areas.
- ❑ Do not use current settings that are higher than necessary. Never exceed 400 amps.
- ❑ Connect the ground clamp to the metal as close to the point of welding as possible.
- ❑ Keep the cables close together by twisting them around each other.
- ❑ Position the welding machine and excess cable away from you.
- ❑ Arrange work so that the cables extend away from you.
- ❑ Do not weld with rapidly repeated short spurts. Wait about 10 seconds in between each weld.

- ❑ If a surface is dirty and starting the weld is difficult, do not strike the rod in a rapidly repeated manner. Wait about 10 seconds between each attempted start.
- ❑ If you feel lightheaded, dizzy or faint, stop the weld immediately, lay the rod down and move away from the welding machine. Arrange your work in advance so that if the handle and rod should be dropped due to a dizzy spell they will not drop into the metal being welded.
- ❑ Do not work on a ladder or in a cramped, confined space.
- ❑ Do not work alone. Ensure whoever you are working with is aware that you have an ICD and understands these restrictions.
- ❑ Avoid being near spot-welding equipment if it does not have more than five seconds time between welds.

End of Life

ICDs or CRT-Ds can cause painful shocks when one is nearing end of life. These shocks will not prolong life and can cause distress to patients and families. Your device can be programmed to turn off the shocking function. Turning off the shocking function does not turn off the pacemaker function. If a change in condition occurs, the shocking function could be turned back on. It is important that you discuss your end of life wishes with your loved ones. Often, if patients do not wish to receive CPR or shocks from pads put on their chest, they may want to consider the shocking function of their device as well.

Death and the ICD or CRT-D

When someone with an ICD or CRT-D dies, the information from their device can still be retrieved. If you have chosen to be buried, your device can be buried with you without any programming. If you have chosen to be cremated, your device must be removed as the generator can explode upon cremation. **Family must inform the funeral home personnel of the ICD or CRT-D so they can take precautions when removing the generator.**

MedicAlert Bracelet

It is a good idea to get an alert bracelet or necklace that tells the public about your device in case of emergency. A MedicAlert brochure is included in this booklet.

Cardiac Rehab

To help prevent more problems with your heart there are four key areas to focus on: medications, diet, exercise and quitting smoking.

Cardiac Rehabilitation Programs offer education and support to people who have heart disease. You are eligible to attend cardiac rehab after the implant of your ICD or CRT-D. We will send a referral to the cardiac rehab site that you prefer.

Local programs include:

Reh-Fit Centre in Winnipeg	204-488-8023
Wellness Institute in Winnipeg.....	204-632-3907
Brandon Heart Program.....	204-578-4204
The Pas.....	204-627-6418
Rehabilitation and Health Lifestyle Program Thunder Bay	807-684-6780

About Your Device

You have a _____.

Your device has _____ wires.

Your device is set to keep your heart from going slower than _____ beats per minute.

If your device is a defibrillator it will treat fast heart rates above _____ beats per minute.

Frequently Asked Questions

Can I use a cellphone?

Yes you can use a cellphone. When speaking or simply carrying your cellphone, you should keep it on the opposite side of your body as your device.

Can I use an iPod or MP3 player?

Yes you can. Carry your player on the opposite side of your body as your device.

Can I use a microwave oven?

Yes, you can use a microwave oven without taking any special precautions.

Can I go through a security system at the airport?

Yes, it is ok to walk through the security screening archways. The system may detect your device and set off the alarm. This will not affect the functioning of your device. Present your ICD or CRT-D identification card to the security personnel. Ask that they perform a hand search and do not use the handheld wand as this might affect your device.

How long should an ICD/ CRT last?

ICDs or CRT-Ds can last from 5-10 years. The average is 7 years. The length of time depends on how hard the generator/battery has to work. This is affected by how much energy is needed to pace your heart and how your device is programmed. We will check the function of your device at each clinic appointment.

Will I feel the ICD/ CRT?

At first, you may feel the weight of the device in your chest. With time, you will get used to it. The generator is small, about the size of a deck of cards, and it weighs about 20 grams.

Can I exercise?

Once your doctor gives you the go-ahead to exercise it is a good idea to exercise regularly. See the Activity Guidelines above for suggestions.

Remote Monitoring?

It will be discussed with teaching and at one month followup.
Most ICD/CRT-D companies offer Remote Monitoring.

- this will be offered to patients usually at no cost.
- often encouraged for patients to optimize followup.

Please note: No phone calls are made to patients if there are no concerns on remote transmission.

My Medication List

Please list all medications, herbals, supplements, vitamins, including prescription and non-prescription medications

Medication	Dose	When taken	Reason for taking

Notes:
