



UNIVERSITY OF OTTAWA
HEART INSTITUTE
INSTITUT DE CARDIOLOGIE
DE L'UNIVERSITÉ D'OTTAWA

ICDs: IMPLANTABLE CARDIOVERTER DEFIBRILLATORS

A Guide for Patients and Families



PLEASE BRING THIS BOOK WITH YOU TO THE HEART INSTITUTE

Patient Name _____

Please complete the following information:

Contact Person
(relative, friend)

Name _____

Phone Number
(Home) _____

Phone Number
(Cell) _____

Family Doctor

Name _____

Phone Number _____

Pharmacy

Name _____

Phone Number _____

Cardiologist
If you have one

Name _____

Phone Number _____

Other (Specify)

Name _____

Phone Number _____

IMPORTANT

Pacemaker/Defibrillator Clinic

Hours: Monday to Friday, 8:00 a.m. to 4:00 p.m. **Phone:** 613-761-4142

Please call the Pacemaker/Defibrillator Clinic if you have any symptoms or concerns throughout your early recovery period.

If you need to speak with someone after hours, the Nursing Coordinator can be reached any time at 613-761-4708.

In case of emergency, call 911

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You had this type of Implantable Cardioverter Defibrillator inserted:

Type: _____ Date: _____

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Patient Responsibility Checklist

The following checklist will help you prepare for your admission:

Before your admission:

- ☐ Fill out the medication list included in this booklet to bring with you along with all your medications in their original pharmacy containers

The evening before your booked procedure:

- ☐ Between 4:00 p.m. and 8:00 p.m. we will call you and tell you what time to come in to the Heart Institute
- ☐ If you do not hear from us by 9:00 p.m., please call the Day Unit at: 613-761-4770

On the day of your admission:

- ☐ Take your usual medications with a small amount of water – unless you have been informed otherwise
- ☐ Nothing to eat or drink from midnight onward before your procedure
- ☐ Remove all nail polish; do not wear any make-up

Make sure you bring the following items with you to the Heart Institute:

- ☐ Your health card
- ☐ All of your medications – in their original pharmacy containers
 - o Make sure you tell us about any allergies you have
- ☐ The name and phone number for your emergency contact person

Leave these items at home:

- ☐ All of your valuables (including money, jewelry, iPads, tablet or laptop computers, etc). The Heart Institute cannot be responsible for any loss or damage to your personal belongings.

Plan for your discharge:

- ☐ Make transportation arrangements: you cannot drive yourself home.
- ☐ For your first night home from the hospital, arrange for someone to stay overnight with you.
- ☐ If you live a long way from the Heart Institute, check with the Waitlist Management office at 613 761 4436 to see whether you should stay close to the hospital the night of discharge – if so, make advance arrangements for accommodations.

Remember: Do not eat or drink after midnight before your procedure, unless otherwise informed.

If you are unable to keep the scheduled date for your ICD implant, please notify the Wait List Management Office as soon as possible at 613-761-4436.

Sometimes there are sudden changes in scheduling which may result in your procedure being delayed. If this happens, we will let you know as soon as possible.

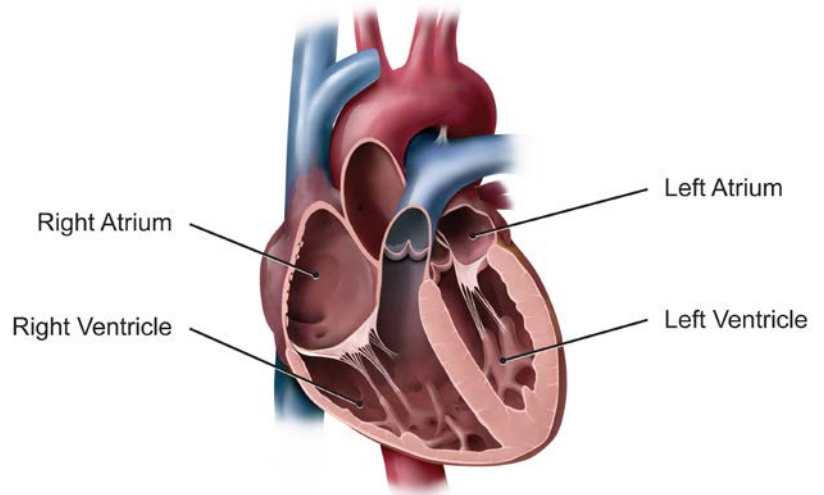
About Your Procedure

About Implantable Cardioverter Defibrillators (ICD's)

You have been recommended to have an implantable cardioverter defibrillator (ICD) to treat your heart rhythm problem. The purpose of this guide is to help you and your family prepare for this procedure and for your recovery at home.

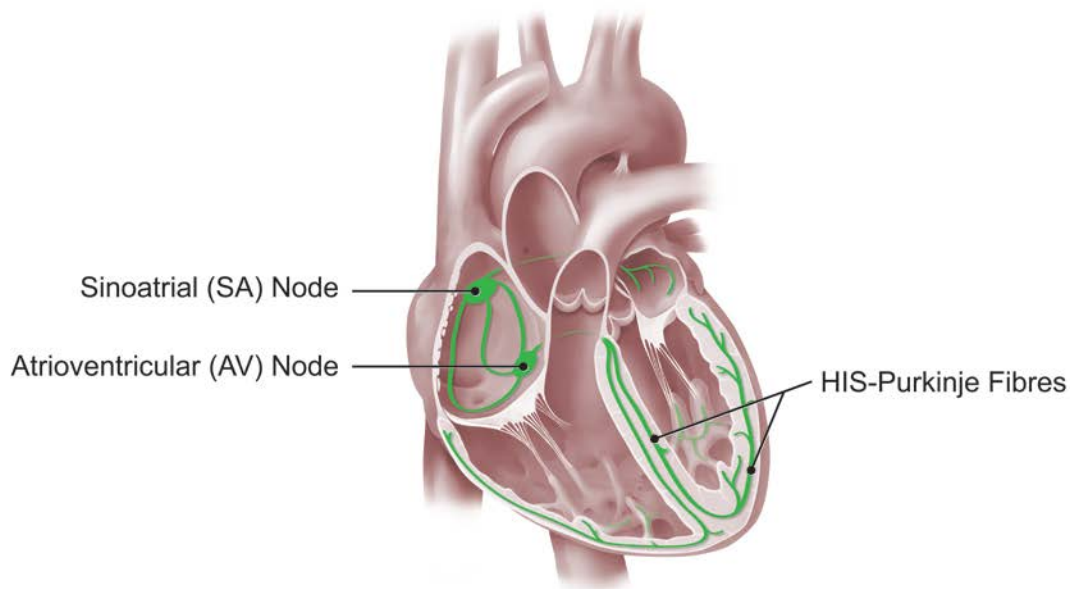
The Heart's Electrical System

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 is divided into a right and left side. Each side has an upper chamber, or atrium, that collects blood returning to the heart and a muscular lower chamber, or ventricle that pumps the blood away from the heart.



The pumping of your heart is regulated by an electrical current or impulse – much like a spark plug in a car. The electrical impulse starts in the sinoatrial (S-A) node, often called the body's natural pacemaker, and then spreads throughout both atria like ripples in a pond. This causes both atria to contract squeezing blood into the ventricles.

The impulse then travels down to the atrioventricular (A-V) node which is like a wire that connects it to the ventricles. The AV node splits into two branches, allowing the even spread of the electrical signal to both ventricles at the same time. This lets your heart beat effectively.



Heart Arrhythmias

Arrhythmias are an abnormality of the heart's electrical system. Ventricular arrhythmias are rapid heartbeats in the lower chambers of the heart. This fast heart rhythm is either ventricular tachycardia (VT) or ventricular fibrillation (VF). Both of these arrhythmias can be life threatening because they prevent the heart from keeping the blood circulating throughout your body.

Implantable Cardioverter Defibrillators (ICD's)

Primary Prevention implantable cardioverter defibrillators (ICDs) are recommended for people who have not yet had a ventricular arrhythmia but who are at risk of having one.

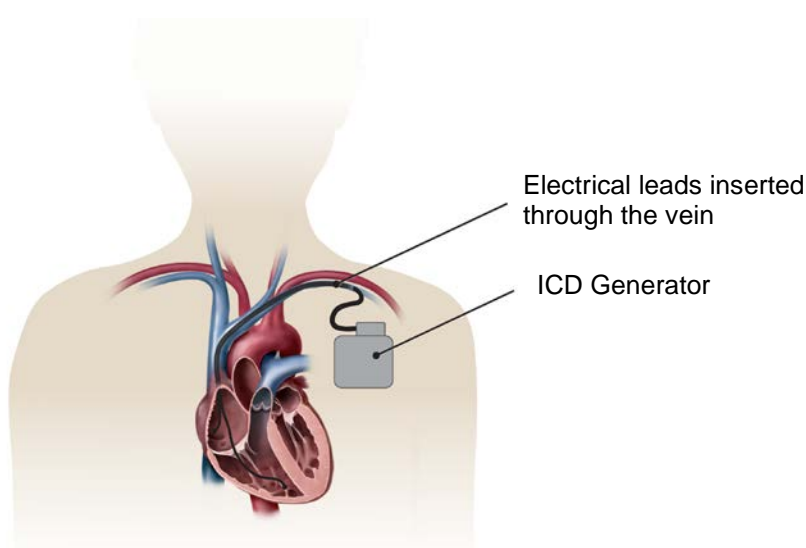
Secondary Prevention ICD's are recommended in people who have already experienced a ventricular arrhythmia and are at risk of having another one.

An ICD is a small device that is implanted under the skin and specially designed to monitor for heart rhythms that could be harmful. When the ICD picks up abnormal, rapid ventricular heart rhythms, it reacts by sending a series of rapid paced beats called anti-tachycardia pacing or by delivering an electric shock to the heart. Both of these actions are designed to quickly restore a normal heart beat. The ICD can also recognize if your heart is beating too slowly and send electric pacemaker signals to help your heart to beat at a normal rate.

Parts of an ICD

There are different ICD models, each of which works in slightly different ways. The decision about which ICD to implant is based on your particular situation.

The ICD has two basic parts: the ICD generator (often referred to as the battery) and one or more wires called leads. The ICD generator contains the battery, important wiring and computer components that make the ICD work properly. When the generator is implanted, it is programmed to recognize harmful heart rhythms. The leads are special wires that are connected on one end to the generator with the other end attached to a spot inside your heart.



In general, ICD's are implanted on the left side of your chest just beneath your collar bone.

Depending on which ICD is implanted, expect to receive an information booklet from the company that made your device in the mail.

This booklet will have extra information about your specific ICD

Every year, thousands of people in Canada receive an ICD. Most people who have ICD implants return to their normal active lives. For more information on life with an ICD, please ask us for the patient information CD titled “Implantable Defibrillator Therapy.” It provides extra information on living with ICD implants.

How the ICD Works

When the generator senses abnormal heart rhythms, it sends out either pacing pulses called anti-tachycardia pacing or an electrical shock to the heart through the leads. The ICD does not prevent the abnormal rhythms from happening but it stops them as soon as they happen. The ICD will also store information about your heart’s electrical activity which is checked whenever you visit the Pacemaker and Defibrillator Clinic.

Anti-Tachycardia Pacing

When the ICD senses abnormally fast heart rhythms, it sends a series of tiny rapid electrical impulses that over-ride the abnormal rhythm. This works to restore a normal heart beat. Usually you will not feel anything when this happens.

Defibrillation

For abnormal heartbeats that are extremely fast, the ICD delivers an electrical shock to stop the arrhythmia. This shock is called defibrillation; it is delivered suddenly and the sensation lasts for a couple of seconds. Some patients describe the feeling as a small thump in the chest while others have felt a strong and uncomfortable sensation like being kicked in the chest.

Bradycardia Pacing

If your heart begins to beat too slowly, the ICD can act like a pacemaker and stimulate the heart to beat at a regular and healthy rate. Usually you will not feel anything when this happens.

Cardiac Resynchronization Therapy

A cardiac resynchronization (CRT) device is a specialized ICD designed for people with heart failure. It is designed to coordinate both sides of the heart to help it to beat more efficiently. CRT devices are usually only used for people with certain types of heart failure.

**Ensure that you know which type of ICD device you had implanted
and write the name on page 3 of this guide**

Preparing for an ICD Implant

At the Heart Institute, ICD implants are done by a cardiologist who specializes in the electrical system of the heart. This specialty is called Electrophysiology. There are several Electrophysiology doctors working at the Heart Institute.

The Electrophysiology doctors work as a team in caring for all patients who are having ICD implants. This means that, depending on the booking schedule, the doctor who does your ICD implant may not be the same doctor that you first saw in clinic.

Before Your Procedure

Please use the checklist on page 5 to help you prepare for your admission to the Day Unit at the Heart Institute.

Day of Procedure

Expect to be at the Heart Institute for 8 to 12 hours. Plan to arrive at the Day Unit according to the instructions you received the night before.

The Day Unit is located on the first floor. Take the elevators from the main lobby at the Heart Institute up to the first floor. When you get to the first floor, follow the green hearts on the floor to the Day Unit.

You will be in the Day Unit area until you are ready to go for your ICD implant and you will come back to the Day Unit once your procedure is completed. The actual ICD implant will take place in a special room called the Electrophysiology Lab. Before you go for your implant, the doctor will come and meet with you in the Day Unit; this will be a good time to ask any final questions you may have.

Only one friend or relative will be able to sit with you while you are waiting because space is limited. During your procedure, your relative/friend will be able to wait in the lounge area. Once you are back and recovering, the staff will call them back in to sit with you until you are ready to go home.

Once you are in the Day Unit, the final preparations for your procedure will start. You will change into a hospital gown. You may have a small intravenous tube placed in your arm. The implant area will be clipped of hair and cleaned.

What are the risks of an ICD implant?

ICD implant procedures are considered to be very safe however, with any invasive procedure, there can be complications. These include:

- Excessive bleeding
- Infection at the implant site

Rarely, the heart or lung can be punctured. If this were to happen, you would be treated immediately.

Occasionally, while everything is still healing, an ICD lead may slip out of position inside the heart. If this occurs, it will be seen in the x-rays and other checks that you have after your procedure. Although this usually causes no harm, you will probably need a second operation to fix it.

Before you are discharged, the nurse will review any signs or symptoms to watch for that may mean there is a problem.

In the Electrophysiology Lab

There will be a team of doctors, nurses and lab technologists involved in your procedure. All staff will be wearing gowns, masks and special lead aprons.

Your chest area will be washed with a cold solution and sterile sheets will be placed over you. It is important that you don't move or touch the top of the sheets once they are in place. A nurse will be available to assist you if you have any concerns during your procedure.

During your procedure, you will receive medications in your intravenous that will make you feel very relaxed. You might even fall into a light sleep. Additionally, to make sure you stay comfortable, you will receive pain medications in your intravenous as needed.

A local anesthetic will be administered to the area below your collarbone to numb the area where the ICD will be inserted.

Once the anesthetic has taken effect, the doctor will make a small incision. Using a special X-ray, the ICD leads will be threaded in to your heart through a vein in your chest. You will not feel any pain, but you may feel some pressure as the veins are entered. The generator is then put into place just under the skin. Tell the nurse immediately if you feel any discomfort or have any concerns. It is very important you remain as still as possible during the procedure.

Once the procedure is finished, the incision will be closed with special stitches. You will not need to have them removed. They will dissolve on their own. If you are having a standard ICD implant, the whole procedure will probably take 1 – 2 hours to complete. If you are having a CRT-ICD, the procedure will take 2 – 4 hours.

After Your Procedure

After your procedure, you will be taken back to the Day Unit on a stretcher or bed. You may be hooked up to a heart monitor that will keep track of your heart rate and your blood pressure. Shortly after your procedure, you will go for a chest X-ray to check your ICD placement.

You may experience some discomfort at the incision site. If you are uncomfortable, tell your nurse and you can be repositioned and given a pain medication to make you more comfortable.

While you are recovering, it is important to avoid moving your affected arm; in particular, you must not raise this arm above your head because that could displace the ICD leads.

You may experience some bruising and discolouration around the insertion site. If you were on a blood thinner before your procedure, this may be particularly noticeable.

You may eat and drink as normal when you return to the Day Unit. Your nurse will assess and assist you as necessary. If you are feeling okay, the nurse will bring you a light snack and something to drink.

Once you are feeling better, you will be able to go home.

You must have someone pick you up at the hospital and drive you home.
The day you arrive home, you will need someone to stay with you during the day and overnight.

Discharge & Follow-Up Care After Your ICD Implant

Before you are discharged from the Day Unit, your doctor and nurse will go over the procedure with you. The nurse will tell you how to take care of your insertion site. Also, they will discuss any changes in your medications. This will also be a good time to talk about returning to work and when you can drive.

Before you leave the Day Unit, you will need your intravenous (IV) line removed and you may require a prescription to take to your pharmacist.

In a week or so, you will receive a temporary registration card in the mail from the Heart Institute.

Expect to receive an appointment card in the mail for your follow-up clinic appointment. If you do not receive an appointment in the mail within a week of having your ICD inserted, please call the Pacemaker and Defibrillator Clinic at 613 761 4142.

Discharge Checklist:

Before you leave, make sure you have received information about:

- ☐ Medication changes? _____
- ☐ Driving restrictions? _____
- ☐ Return to work? _____

Caring for Your Insertion Site

The area around your insertion site, including the incision, must stay dry. Avoid taking a shower until it is well-healed – usually a week to 10 days. You may take a bath but keep the insertion site completely dry.

Remove the initial bandage two days after your procedure. Leave the area open – do not wash or put any creams or ointments on it. If you are more comfortable with the area covered, apply a small, dry gauze dressing with 1 piece of tape to keep it secure.

Mild discomfort at the insertion site is normal and may be treated with acetaminophen (Tylenol®) as directed on the bottle. If your pain is not settling, call the Pacemaker/Defibrillator Clinic; you may need a stronger pain medication.

If you have questions, call the Pacemaker and Defibrillator Clinic

Monday to Friday 8:00 a.m. to 4:00 p.m. Phone 613 761 4142

If you need to speak with someone during Off-Hours, the Nursing Coordinator can be reached at any time at 613 761 4708.

Check the insertion site every day and call the Pacemaker/Defibrillator Clinic at 613 761 4142 if you have any of these problems:

- ☐ A lump that keeps getting bigger
- ☐ Redness or tenderness, or warmth around the incision
- ☐ Yellow pus or other fluid seeping from the incision
- ☐ The incision site starts to become severely painful
- ☐ You develop a fever or chills

Activity Guidelines:

It can take up to 4 weeks for the ICD leads inside your heart to become firmly embedded. To avoid dislodging the leads, follow the activity guidelines in the table below:

Time line:	Avoid these activities	You can do these activities
First 24 hours:	Avoid moving your shoulder on the side of the insertion	You can bend your elbow
First 2 weeks:	Do not lift your affected arm over your head	After the first 24 hours, you can move your arm freely below your shoulder
First 4 weeks:	Do not lift anything heavier than 10 lbs (5 kg) Avoid any kind of sports or other vigorous activities such as golf, tennis, swimming, or sweeping	After 2 weeks, you can begin to do most of the other normal activities that you did before the procedure
First 8 weeks:	Avoid any kind of shoveling	After 4 weeks, you can begin to do all of the other normal activities that you did before the procedure

Driving

Returning to driving is an important question that many patients ask us about.

The Ontario Ministry of Transportation is responsible for deciding when it is okay for you to drive and your doctor is legally obligated to inform the Ministry if you have a medical condition that may impact your fitness to drive.

It is well known that medical conditions such as ventricular arrhythmias can make even the best drivers unsafe and the Ministry takes this information into account when making decisions about your license.

If you have had a *Primary Prevention ICD* inserted which means that, although you are at risk, you *have not* actually had an episode of ventricular arrhythmia, then you cannot drive for one month after your ICD implant. Your license will not be suspended and your doctor will not inform the Ministry of Transportation.

If you have already had an episode of ventricular arrhythmia and are at risk for having another episode, then you have a *Secondary Prevention ICD*. In this case, you will not be able to drive for at least six months. Your license will be suspended by the Ministry of Transportation.

In order to have your license reinstated, you will need to provide the Ministry with a report that involves having your ICD activity checked by the Pacemaker / Defibrillator Clinic. Please discuss this further with the nurse in the clinic so that your follow up appointments can be timed properly.

If you have a commercial license, the rules are stricter and you need to discuss this with the doctor during your first consult appointment.

What to do if you feel a shock

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

If you receive a single shock and feel fine, there is no need to go to an emergency room. Call the Pacemaker/Defibrillator Clinic at 613 761 4142 on the next working day; they will arrange for you to come to clinic.

Go to the nearest Emergency Department if:

- You receive a shock and continue to feel unwell
- Your symptoms get worse
- You receive multiple shocks

***If you do visit an emergency department, ask that any reports or tests be faxed to the Pacemaker/Defibrillator Clinic at fax # 613-761-4736.

Follow-Up Appointment at the Pacemaker/Defibrillator Clinic:

You will need to be seen in the Pacemaker/Defibrillator Clinic within 2 to 4 weeks after your ICD insertion.

You will receive a follow-up appointment card from the Pacemaker/Defibrillator Clinic within a week. If you do not receive an appointment card, call the clinic at 613 761 4142.

At the same time, please schedule an appointment with your Family Doctor to talk about your ICD and how it may affect any other health problems that you have.

For your follow-up appointment, please bring the following:

- ☐ Your medication list and your medications in their original packaging
- ☐ The name of your family doctor and cardiologist (if you have one).
- ☐ A list of any questions or problems that you wish to discuss.

About the Pacemaker/Defibrillator Clinic:

The Pacemaker and Defibrillator Clinic is an outpatient clinic designed to care for patients who have had a device implanted to correct or address arrhythmia problems. The clinic is staffed with cardiologists and registered nurses who specialize in the care of patients with pacemakers or internal cardiac defibrillators (ICD).

The clinic is open Monday to Friday from 8:00 a.m. to 4:00 p.m. Phone messages left over the weekend will be answered on Monday. Clinic appointments may be scheduled any day of the week but are usually scheduled on Monday, Tuesday, Wednesday or Thursday.

Clinic visits are by appointment, if you are not feeling well or if you have questions, call the clinic and speak to one of the staff. They may be able to help you over the phone or, if needed, they will schedule an appointment for you to be seen in clinic.

Please call the Pacemaker and Defibrillator clinic to cancel or change an appointment 48 hours in advance of the appointment.

The Goals of the Clinic are to:

- Look after aspects of your health related to your ICD device
- Educate you and your family about your device
- Maintain patient records regarding how your device is functioning.

At each clinic visit expect to see a nurse **or** a nurse and a doctor. During your clinic appointment, the nurse will interrogate your device to obtain information on how it is functioning. The information about your device will be reviewed and any necessary changes will be made.

At the same time, the clinic staff will be available to answer any questions you or your family might have about your particular device or how it is functioning.

Who We Work With

Monitoring and care of your device is only one part of your care. The clinic staff works in partnership with **your other doctors**. It is our responsibility to communicate the details of your visits to your family physician and your cardiologist.

If you already have a cardiologist, you will continue to see them for all general cardiology check-ups. If you don't have a regular cardiologist, please ask the clinic staff and they will help you to find one.

The Pacemaker/Defibrillator Clinic is located on the 1st floor of the University of Ottawa Heart Institute.

Patients who have had an ICD implant are routinely seen at the clinic every six months or more often if necessary.

Adjusting to an ICD Implant

Even though an ICD implant is a potentially life-saving device, it can take some time to adjust and to feel normal again. Some patients *and* family members tell us that, after the ICD implant, they had periods of denial, fear, depression, and sometimes even anger.

The good news is that, over time, both patients and family members gradually get used to the device and begin to return to normal.

The following steps have been shown to help patients and family members adjust to their ICD in a positive and productive way:

- Get as much information as you need about your ICD – this will help you feel more in control
- Understand that any emotions that you are feeling are normal and talking about them is a good release
- Talk to other people who have had ICD implants – listening to their experiences will give you ideas throughout your own adjustment period
- Work on gradually returning to your normal activities – this will help build your confidence

Finally, if you find yourself becoming overwhelmed, make sure you talk to your doctor or the clinic staff; you might need a bit more support.

Responding to an ICD Shock

- Expect that, at some point, you will receive a shock from your ICD
- Make sure both you and your family know what to do if you receive a shock (see page 8)
- After a shock, take time to focus on breathing and relaxation – give yourself time to do a quick check on how you are feeling
- Contact the Pacemaker/Defibrillator Clinic on the next business day; make sure you ask any questions that you need to
- Check your thinking – remind yourself that the ICD is helping you to continue to do all the activities that you enjoy

Many patients have reported that, after their first shock, they felt less anxiety because now, they knew that their device was working properly and that it would keep them safe.

Implantable Cardioverter Defibrillator Support Group

The ICD Support Group meetings provide the opportunity to meet and speak with other ICD patients in an informal setting. Many sessions feature guest speakers on a variety of heart health topics. An advanced practice nurse attends the meetings and can help with questions or concerns that you may have.

The group meets monthly at the University of Ottawa Heart Institute. You will receive a calendar of dates and times as well as session topics with your appointment card in the mail from the Pacemaker/Defibrillator Clinic.

You will receive a reminder of the support group meetings with your discharge information.

Frequently Asked Questions

Can I use a cellphone?

Yes, you can use a cellphone. It is recommended to talk on the cell phone and carry it on the opposite side of your ICD.

Can I use an iPod or MP3 player?

Yes, you can. It is recommended that you keep the player to the opposite side of the ICD when you are using or carrying it.

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; however, it will not affect the functioning of your device. Present your device identification card to the security personnel. Ask that they clear you after a hand search and that they not use the handheld screening wand because it might affect your device.

How long should an ICD last?

ICD's can last anywhere from two to ten years (average is five years). The length of time depends on how hard the generator/battery has to work, which is affected by how much energy is needed and how your ICD is programmed. The functioning of your device will be assessed at each clinic follow-up appointment.

Will I feel the ICD?

At first, you may feel the weight of the ICD in your chest. With time, most people become accustomed to it.

Can I exercise?

Once your doctor gives you the go-ahead to exercise, it is a good idea to exercise regularly.

Can I hurt someone if I am touching him or her when my ICD gives a shock?

No.

When can I resume sexual activity after my ICD implant?

If your admission to the hospital is for only the ICD implantation, you can resume sexual activity in a couple of weeks or after your incision has healed. If you have been admitted to the hospital for a heart attack or heart failure, or you have had open heart surgery, please ask your doctor about safely resuming sexual activity.

If you have other question about your ICD, please bring them to your Pacemaker / Defibrillator Clinic appointment to discuss with the nurse. If you have more urgent questions, please phone the clinic and we will do our best to get the information that you need.

My Medication List

List all prescription medications you are currently taking and over-the-counter (non-prescription) medications and supplements, such as vitamins, aspirin, acetaminophen (Tylenol®) and herbals (for example, ginseng, ginkgo biloba and St. John's wort). Include prescription medications taken as needed (such as nitroglycerin or Viagra®).

Name of Medication	Dose	When Taken	Reason for Taking

For More Information

Informative Websites:

- University of Ottawa Heart Institute
 - www.ottawaheart.ca
- Heart and Stroke Foundation of Canada
 - www.heartandstroke.ca
- Heart Rhythm Society
 - <http://www.hrsonline.org>
- Canadian Heart Rhythm Society
 - <http://www.chrsonline.ca/>

ICD Device Companies

The ICD device companies have further frequently asked questions listed on their websites:

Medtronic: www.medtronic.com/patients/tachycardia/living-with/index.htm

Boston Scientific: www.bostonscientific.com/lifebeat-online/live/icd-patients.html

Medic Alert Bracelet:

It is a good idea to get an alert bracelet/necklace that informs the public regarding the device you had implanted in case of an emergency. For more information, go to the Medic Alert website: <http://www.medicalert.ca>

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