

Patient Information About ICD's

You have been referred to a specialist to discuss the risk of life threatening heart rhythm disturbances and whether an implantable cardioverter defibrillator (ICD) would be useful for you. This pamphlet is intended to provide information to you and your family/friends about what an ICD is, why it may be helpful to you, and the advantages and disadvantages of having an ICD.

1. What does ICD stand for?

The letters, I-C-D, are an abbreviation for **I**mplantable **C**ardioverter **D**efibrillator.

2. What is an ICD?

An ICD is a medical device that is implanted under the skin much like a pacemaker but an ICD generator (or commonly called a “battery”) is larger. The ICD system consists of the generator (about half the size of a pack of playing cards) AND one or more wires



Figure: Two examples of ICD generators are shown with a two-dollar coin in between for size comparison.

(also called “leads”). The ICD leads connect the ICD generator to the heart so that it can monitor your heart beat, recognize when the heart develops a dangerously rapid racing and then automatically treat it with electric shocks. These shocks can reliably correct (“stop”) the abnormal heart rhythm that could otherwise be fatal.

The ICD also contains many features of a pacemaker, which treats any heart slowing that may occur. Some ICD's have a third wire that goes into the left side of the heart and is intended to improve the heart's pumping function. Remember to discuss this with your doctor, since the decision regarding the number of wires is based on a number of factors specific to each patient's case.

3. How is the ICD implanted or “inserted”?

The ICD generator is placed under the skin in the chest beneath your right or left collarbone. The ICD leads are inserted into a large vein that runs under your collarbone and are guided under X-ray to the heart. Implantation of an ICD is a small operation that will be performed in the Device Implant Room at University Hospital, London Health sciences Center. The procedure does not require major surgery such as opening the chest so that a general anesthetic is not usually required. Patients are usually give mild sedation through the intravenous line to reduce anxiety. The doctor will inject local anesthetic (“freezing medication” or “dental freezing”) to numb the area. While the local anesthetic

may sting as it is injected, once it takes effect, you should feel very little pain during the implant procedure.

During the implantation procedure, the doctor may wish to test the ICD to ensure that it works appropriately. If so, you will be put into a deeper sleep with more sedative medication through the intravenous line. The staff will then trigger your heart to race rapidly and instruct the ICD to give your heart a shock and take measurements to ensure that the ICD is working satisfactorily. Once that is completed, the incision is closed using sutures that dissolve on their own and do not need to be removed. A clear dressing that feels like plastic film wrap is placed over the wound to keep it clean. You are then taken from the procedure room to a recovery room to rest. An chest X-ray and electrocardiogram are performed and nurses will provide you with instructions about care of your wound and a follow-up appointment in the ICD Clinic. When you are sufficiently recovered, you will be discharged home.

4. How does the ICD work?

The ICD wires connected to the heart pick up the electrical signal coming from your heart as it beats and feeds that signal into the ICD generator. The ICD generator contains a battery and computer circuits that help it recognize when the heart is going slowly or rapidly and dangerously. If and when the heart suddenly starts racing dangerously, the ICD detects this and the computers inside will tell the ICD to automatically give a shock to correct the heart rhythm or alternatively, deliver smaller electrical impulses to pace your heart gently out of the dangerous racing and back to normal. The ICD successfully corrects the heart rhythm in virtually all circumstances, but it does not affect why the event happened nor will it prevent it from happening again. Recurrences can only be prevented by heart medications or other procedures. Approximately one third of patients with an ICD take a medication to try to prevent the heart from racing.

What the ICD does when a dangerous heart-racing episode occurs depends upon how the ICD is programmed by the doctor and ICD Clinic nurse.

5. How is the ICD programmed?

The doctor or nurse can communicate and program the settings of an ICD specific for your needs and your type of medical problem. To do this, we use an ICD programmer, which is a laptop computer that sends radio waves to talk to ICD inside your body. The ICD also stores information about what is happening to the device and can send that information back to the programmer by radio waves so the doctor or nurse can check the ICD regularly. To communicate with the ICD, the nurse will place a plastic disk that is connected to the programmer over the skin area where your ICD is implanted. These radio waves will not harm you.

6. What types of persons are considered for an ICD?

Two types of people are usually offered an ICD. The first type of person is someone who has already experienced one or more episodes of dangerous heart racing leading to a blackouts or even cardiac arrest (commonly referred to as “heart stoppage”). Based on the circumstances and heart function, the doctor often recommends an ICD to protect patients in the event that the heart-racing episode returns. The second type of candidate for an ICD is a person who has had severe damage to their heart caused by such things as a

previous heart attack or weakened heart muscle from leaky valves or previous viral infections. These people are at increased risk of having a fatal heart racing attack, even though it has not actually happened yet. Most patients that experience a cardiac arrest do not survive to receive an ICD. As a result, patients at risk for cardiac arrest may undergo ICD implant as a form of sudden death prevention.

7. What are the benefits of an ICD or why should I have one?

Your doctor has determined that you are at risk for having a dangerous and potentially lethal attack of heart-racing. These attacks can occur without advance warning at any time. The major benefit of an ICD is that it can prevent a patient from dying suddenly if an attack should occur and provides reassurance and peace of mind to the patient and family that he/she is protected from the tragedy of an unexpected sudden death. A useful analogy is to think of an ICD like one thinks of a fire extinguisher in the home. If you have one in the house, it can be used to put out a potentially dangerous fire should one occur BUT a fire extinguisher does not prevent a fire from breaking out in the house at any time. The same applies to an ICD. It cannot prevent a dangerous heart-racing bout from occurring but it can stop it if it happens.

8. What are the disadvantages or risks of an ICD or why might I not want one?

The first concern is the risk of the implant procedure. There is no medical procedure that is without some risk. These risks will be explained to you before getting your consent to go ahead with the surgery. Minor complication such as minor bleeding or bruising, pain at the surgery site occur about 2-5% of the time. Major complications from surgery, including collapsed lung, ICD lead falling out of the normal position or going through the heart wall occur about 1% of the time.

The second disadvantage is that the device may deliver shocks when the heart develops another kind of heart racing that is NOT dangerous. This happens in up to 25% of patients. Shocks can be painful and unsettling but can often be reduced or avoided after careful ICD re-programming or medications.

The third issue is that the ICD is a machine that is subject to normal “wear and tear and needs to be checked regularly (approximately every 6 months) at the out-patient ICD Follow-up Clinic. During those visits, the battery strength is checked. A new battery usually lasts between 4-7 years. The ICD is also checked for any signs of malfunction. Rarely ICD models can be made with serious defects that can cause the ICD to fail. Fortunately, this is very rare but is a limitation of all implanted devices.

Most patients feel better knowing that they have a device inside them that protects them but, in general, ICD will NOT improve how much physical activity you can do. The only exception is a special three-wired ICD that is offered to certain patients meeting certain criteria. You are certainly welcome to ask the doctor during your visit whether you may be a candidate for such a special ICD.

Finally, the ICD does not prevent all sudden deaths nor will it affect death from poor heart function (heart failure) or other diseases such as kidney or lung disease, stroke or cancer. It can only prevent some deaths from dangerous rapid heart racing.

9. What things can I not do with an ICD?

We encourage patients receiving an ICD to resume as normal a lifestyle and physical activity as they were enjoying before the ICD. You can continue to operate household appliances including a microwave and radios. Please avoid putting magnets (even fridge magnets) on the skin over the ICD. Avoid being in areas where there are strong magnets and, for the time being, avoid MRI scans. When walking through security scanners or anti-theft scanners in airports or stores, walk straight through the detector gate as instructed without pausing. In general, having an ICD does not prevent you from driving a car. Driving licenses are usually suspended when you have had episodes of dangerous heart racing that required the ICD to treat and not because of the ICD itself.

Finally, things to think about...

Considering an ICD means thinking about end of life issues, which can be difficult for some people and their families. The ICD may affect how long you live, but for the most part does not affect how well you feel. Try to think about what you expect out of life, how enjoyable life is and how worried you are about the issue of sudden death. You should discuss this with your doctor, since an ICD is not for everyone.

Shocks are experienced by 10-30% of ICD patients each year. Most patients are aware of the shock, and describe it as painful. Although having an ICD often leads to peace of mind from the protection it provides, shocks can be stressful and can contribute to anxiety and depression in ICD patients. On the whole, most patients report that the device does not bother their everyday life, but receiving an ICD does involve recovery from the surgery and a minority of patients has ongoing discomfort from the implant.

Please think about these things, talk to your family and friends, and to your doctor about them. Further information about ICDs can be obtained at: <http://www.hrs.org>

Written and intended solely for use by:
The Arrhythmia Service
London Health Sciences Center-University Hospital
339 Windermere Road
London Ontario Canada
N6A 5A5