

## Implantable Cardiac Defibrillators (ICDs)

### Introduction

The heart has its own electrical system to control its pumping. This system normally coordinates the contraction (squeezing) of the heart muscle and keeps the heart beating in a regular manner. Sometimes, however, there are problems with this system and arrhythmias (abnormal heart rhythms) can occur. There are many types of arrhythmias, and some are more serious than others. Arrhythmias which affect the main pumping chambers of the heart (the ventricles) can be particularly dangerous.

'Ventricular Tachycardia' and 'Ventricular Fibrillation' are life-threatening arrhythmias that require immediate treatment. Management options for people who are at high risk of developing these arrhythmias include medication and surgical procedures to try to prevent the arrhythmias from occurring.

If they do occur, a 'defibrillator' is a piece of equipment that delivers a controlled electric shock or series of shocks to the heart to try to return it to its normal rhythm. These machines are carried in specially equipped ambulances and are also located in hospitals and some clinics. Increasingly, defibrillators are available at other locations including some commercial aircraft and where large numbers of people congregate, such as football grounds.

In some cases, a small, specialised defibrillator may be implanted in a person's chest to monitor the heart's rhythm and deliver an electric shock (defibrillate) as appropriate. These devices are called 'Implantable Cardiac Defibrillators' or ICDs.

### What is an ICD?

An ICD is a sophisticated device, somewhat like a pacemaker but larger in size and with many more functions. This device can:

- identify a life-threatening heart rhythm (ventricular tachycardia or ventricular fibrillation)
- pace the heart beat to a programmed rate to try to return the heart rate to normal
- deliver an electrical shock to return the heart rhythm to normal
- support the heart rhythm (like a pacemaker) if the heart rhythm is very slow
- collect and store information about the heart's electrical activity for review and analysis by a doctor.

### Who is suitable?

People may be suitable for an ICD if they have had:

- a life-threatening heart rhythm that may occur again
- successful out-of-hospital resuscitation

- evidence of life-threatening rhythms obtained through various tests – usually a test that checks for abnormal rhythms in the heart (electrophysiology study)
- unsuccessful treatment (e.g. medication, surgery or other procedure) for an abnormal heart rhythm
- damaged pumping function of the heart, and are known to be at higher risk of a dangerous heart rhythm.

A cardiologist will explain the benefits of receiving an ICD. In Australia, there are currently over 250 ICDs implanted every year.

### **What happens during the procedure?**

The operation is done in the Cardiology Laboratory or an Operating Theatre. The person receiving the ICD is usually anaesthetised or sedated and does not suffer any discomfort during the procedure.

During the operation the cardiologist will test the settings on the ICD to make sure that they meet the individual's specific needs. Antibiotics are given before the operation to prevent any infection. Electrical leads or fine electrodes, capable of both pacing the heart and delivering an electric shock, are threaded into the right chamber of the heart. The ICD device is positioned in the chest under the collarbone or occasionally in the wall of the abdomen. Modern devices can be expected to last for up to five years or more.

After the ICD has been implanted the person will spend a brief period of time in an area that has heart-monitoring facilities, i.e. the hospital's Coronary Care or Intensive Care Unit.

A test called an 'electrophysiology study' (a test that checks for abnormal rhythms in the heart) may be conducted before the person leaves the hospital. Either the cardiologist or nurse will provide information and advice about wound care, follow-up appointments and practicalities such as driving. The length of the hospital stay can vary, but is generally between two and four days.

### **What kind of follow-up is expected?**

Regular checks are important to make sure the ICD is working correctly, and ongoing appointments with the cardiologist will include tests of the ICD. The tests usually take about an hour. These appointments generally take place every six months, but may be more frequent in some cases.

### **What happens when the ICD delivers a shock?**

People react differently to the shock itself, but most describe it as "a kick in the chest". Some report brief chest discomfort which lasts a few seconds.

### **How will an ICD affect my lifestyle?**

Having an ICD implanted can be a stressful experience, as can the illness that came before it. The cardiologist and staff at the hospital are there to help people receiving ICDs and their families deal with all their concerns. Talking to medical carers and having an understanding about the ICD and how it works will ease many of these concerns.

As the general health of each person is very different, a set of questions listed below will guide you in asking your cardiologist about adjusting to life with an ICD:

- Can I drive?
- What happens if the device does not work?
- Can I return to work?
- Will I trigger the device to shock inappropriately when I am exerting myself?
- Will I trigger the device to shock inappropriately if I get upset?

- My partner/carer/family is scared and will not let me do anything. What can I tell them?
- Are there any support groups for people with ICDs?
- What sports can I play?
- Is the device sensitive to electric devices and magnets?
- Can I go overseas/interstate for a holiday?
- Who do I call if I think something is wrong?

Your cardiologist and nursing staff involved in ICD implantation and follow-up are available to answer your queries and deal with any problems after your discharge from the hospital.

Information on a range of heart health issues can be obtained by calling Heartline, the Heart Foundation's national telephone information service, on 1300 36 27 87 (local call cost).

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