

A GUIDE FOR PATIENTS

Pacemaker and ICD Insertion Procedure



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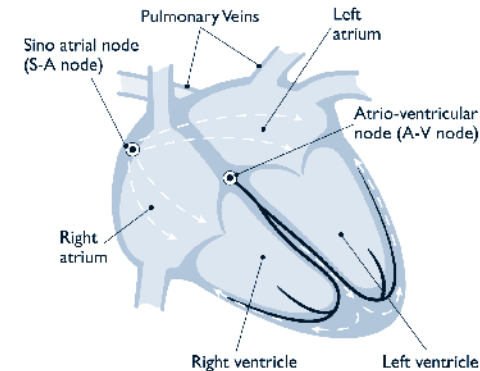
Pacemaker / ICD Insertion Procedure

This booklet is designed to provide information for patients undergoing pacemaker and ICD (implantable cardioverter defibrillator) insertion. The following questions will be answered.

- How does the heart's electrical system work?
- What is a pacemaker/ICD?
- Why do people need pacemakers & ICDs?
- What type of pacemakers & ICDs are there?
- What is involved in the pacemaker/ICD insertion operation and wound care?
- How long will my pacemaker/ICD last?
- Will having a pacemaker/ICD affect my lifestyle?
- How long will my pacemaker last?
- Will having a pacemaker affect my lifestyle?

Normal Heart Function

The heart pumps blood around the body. It has four chambers. The 2 upper chambers are called the atria. They receive blood from the lungs and body and contract to move the blood to the lower chambers called the ventricles. The ventricles contract to pump blood back to the lungs and to the rest of the body. Contraction of these chambers is controlled by the heart's electrical system.



The Heart's Electrical System

The heart sends electrical signals along special pathways through the heart to enable the heart to beat correctly.

SA (sinoatrial) or sinus node

The sinus node is the heart's natural pacemaker. It is a collection of special cells, which send an electrical signal through both atria, causing them to contract. The contraction of the atria pumps blood into the ventricles.

AV (atrioventricular) node

The AV node passes the electrical signal from the atrium to the ventricles.

Conduction Pathways

These pathways conduct the electrical signal from the AV Node to the ventricles. This causes the ventricles to contract, pumping blood to the lungs and the rest of the body.



Why do people need pacemakers/ICDs?

Disorders of the heart's electrical system result in rhythm disturbance "arrhythmia".

Arrhythmias prevent the heart from beating efficiently. When this occurs, the heart may be unable to pump a sufficient supply of blood to meet the body's needs.

Common symptoms of arrhythmia include:

- dizziness
- weakness
- blackouts and fainting
- shortness of breath
- extreme fatigue
- palpitations
- chest discomfort

Arrhythmias include the heart beating:

- too fast (tachycardia)
- too slow (bradycardia)
- chaotically (fibrillation)

A pacemaker is usually used to treat and prevent bradycardia but some pacemakers can assist in the management of tachycardia or atrial fibrillation by helping to alleviate the symptoms and allow the use of medications to control the rhythm problems.

An ICD is typically used to treat life-threatening tachycardia or fibrillation from the ventricles. It can also treat bradycardia. Patients with severe heart failure are at risk of rhythm disturbances and your cardiologist may discuss this with you.

Types of pacemakers & ICDs

Your cardiologist will determine what type of pacemaker or ICD you will need. The different types include:

1. **Single chamber pacemaker** which has one lead that is positioned in either the right atrium or right ventricle.
2. **Dual chamber pacemaker** which has two leads, one positioned in the right atrium and the other in the right ventricle.
3. **Cardiac Resynchronisation pacemaker** which has two pacing leads to activate both the right and left ventricles and may also have a lead in the atrium. This type of pacemaker is used to treat heart failure, helping the left ventricle contract in a more coordinated and effective fashion.
4. **Antitachycardia pacemaker** which is able to treat tachycardia from the atrium with rapid pacing and can be a feature in any of the above.

5. Implantable Cardioverter Defibrillator (ICD)

is a device that has pacemaker functions as above but can also deliver an electrical shock if the heart goes into a fast (and potentially dangerous) ventricular rhythm. It too can be 'biventricular' and pace both the right and left ventricles to improve heart function.

Pacemakers now have the ability to detect, record and monitor arrhythmia and can transmit data to your cardiologist via a telephone connection.

Rate responsive pacing allows for the adjustment of the pacing rate according to the body's needs; e.g. level of physical activity.





Preparing for the procedure

- You will be asked to sign a consent form.
- You will probably be required to fast (no food or drink) 3 – 6 hours before the procedure – your cardiologist will give you instructions.
- You will be instructed what to do about anticoagulant medication (e.g. Warfarin). Take all your other medications.
- Please bring all your medications into hospital with you.
- The cardiologist may request an ECG and blood test.
- An intravenous cannula will be inserted. Antibiotics are given via the cannula immediately before the procedure to lower the risk of infection.
- You will need to shower before the procedure and change into a gown.
- You will have the hair removed from the operation site (usually the left or right upper chest region) with electric clippers. Please do not shave yourself.
- The area may be washed with antiseptic one hour prior to the procedure (it is important to tell the staff if you have an allergy to iodine)
- It will not be necessary to remove glasses, hearing aids or dentures.
- If you require a sedative it will be given to you before the procedure. It will help you to relax, but should not make you sleepy. An additional sedative or painkiller can be given during the procedure if needed.
- Sometimes the procedure is performed under general anaesthesia – you will meet your anaesthetist before the operation. In this case you must fast completely for 6 hours.
- You should use the toilet before the procedure.

The Procedure

The insertion of the device will be performed in the cardiac catheter laboratory under sterile conditions to prevent infection. The procedure time depends on the device used and ranges from a short 30 minute operation to several hours for more advanced ICDs.

The site is numbed with local anaesthetic and the cardiologist will make a small incision into the skin on the front of the chest wall just below the collarbone. The pacing leads are then passed through a vein to the correct position in the heart guided by an x-ray machine which sits above your chest. The device generator is then attached and buried in a “pocket” beneath your skin.

The wound will be closed with sutures, usually dissolvable and beneath the skin. Depending on the cardiologist’s preference the incision will either be covered with steri strips and dressing, or may be covered with a sterile glue.

You will then be transferred to the cardiology ward where your heart rate, rhythm, blood pressure and wound site will be checked regularly. You will have a chest xray. Your device will be checked with a programmer, a device used in follow-up to check and change the settings of implanted devices.

There are some risks associated with having a device inserted. They include local tissue infection, formation of blood clots, damage to the heart wall with bleeding around the heart, damage to blood vessels and partial collapse of one lung. Very occasionally one of the device leads may move and have to be repositioned. These uncommon complications are easily identified and can be treated.

During ICD implantation, ventricular fibrillation will usually be induced in order to test the device function. This carries a small risk and requires deeper sedation and your cardiologist will explain this to you before the procedure.

After the procedure

Prior to discharge

- A technician will check the device function.
- You will be given an identification card that states the type of device. It is important to carry this card at all times. A medic alert bracelet or pendant is also a good idea.
- You will have a review appointment arranged within a few weeks of discharge to check wound healing and the device settings.
- Regular brief clinic visits (often just once per year) are then necessary to determine device function, make modifications to suit your heart condition and to determine and optimise the battery life of the device.

Information for home

Wound Care

- Shower normally but do not rub or vigorously dry the incision.
- Pat wound gently to ensure the incision is kept dry.
- Leave the dressing or steri strips in place for at least a few days or until it starts lifting, by itself.
- Do not change or add to the dressing.
- If glue is used let it come off in its own time (2-3 weeks). Do not pull it off or allow anything adhesive such as dressings or ECG dots to be stuck over the top of the glue.
- Do not touch the incision unnecessarily.
- Some bruising is normal, particularly if you are on Aspirin or another blood-thinning drug.
- Observe for signs of infection at the incision site, redness, or drainage of fluid from the site. If these signs occur contact your cardiologist.

Medications

- It is important to continue all medications as directed by your cardiologist.

Activities

- Use the arm normally but avoid lifting the arm above your head unnecessarily until the discomfort is gone.
- Avoid lifting heavy objects for the first 1-2 weeks.
- Avoid any activities that may put direct pressure on the device site.
- Your cardiologist may restrict some physical activities until the incision is healed, so be sure to ask your cardiologist about these.
- Do not manipulate the device under the skin as it may interfere with the device.

Interference between electrical equipment and your pacemaker/ICD

- This is very rare.
- Electric arc welders produce a very strong electrical signal which can be misinterpreted by your device as your heart beating resulting in no pacing. Alternatively an ICD shock may be triggered. You should stay at least 2 metres away from these.
- Some security equipment (such as theft detectors at shop entrances) can interfere and you should walk past these without stopping. Airport security scanners have been shown to be safe.

- Other industrial and certain electrical medical equipment can interfere and you should ask your cardiologist.
- Use your mobile phone on the side opposite the device.
- You cannot ordinarily undergo MRI (magnetic resonance imaging) scanning with a pacemaker or ICD. Some pacemakers are now available (and ICDs will probably follow) which allow MRI to be performed safely. CT (computerised tomography) and ultrasound scans are perfectly safe.

How long will my device last?

- This depends on many things including your underlying condition, the electrical contact between your heart and the pacemaker leads and the type of pacemaker/ICD you are given. Careful programming of the device at the initial visits can make a significant difference to battery longevity.
- Depending on these factors, your pacemaker can last anywhere between 5 and 20 years, commonly around 10 years.
- ICDs will last between 5-10 years, depending on various factors.
- You will be alerted to the need for pacemaker/ICD replacement at your clinic visit. The whole device is replaced in a very simple procedure which usually does not require new pacing leads and is thus easier than the initial implantation

procedure.

Further more specific information is available from your cardiologist and pacemaker technician.

Tell the cardiologist should you experience:

- signs of infection at the incision site (as previously described)
- chest pain or shortness of breath
- light-headedness, dizziness, or fainting
- persistent weakness/fatigue
- unusual heart rate increase or palpitations.

Please contact Hollywood Private Hospital Coronary Care Unit on (08) 9346 6021 if you have any further questions or concerns.

*Created December 2003
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