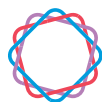




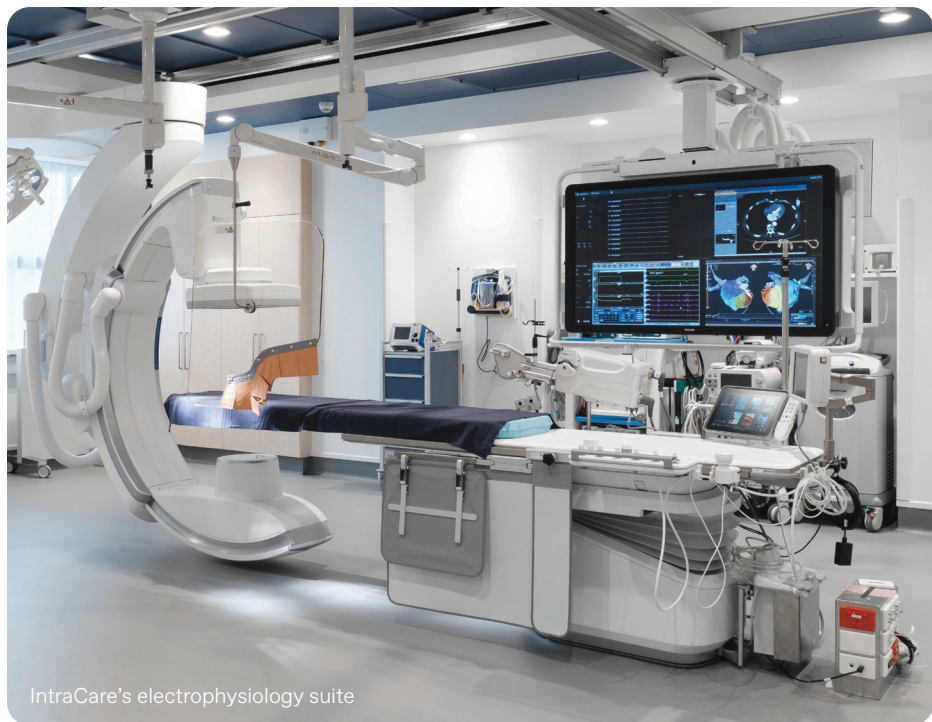
YOUR GUIDE TO

Pacemaker Implantation



IntraCare

Electrophysiology



IntraCare's electrophysiology suite

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About this procedure

This guide provides information about a pacemaker implantation procedure. It includes details about what is involved, how to prepare and what to expect during and after the procedure. Please use this in addition to information from your doctor and nurse.

A pacemaker implantation is performed in a catheterisation or electrophysiology (EP) suite at IntraCare in Epsom. Your cardiologist will be assisted by our team of nurses and other highly skilled personnel.

Both IntraCare and Allevia Hospital will be involved with your care for this procedure. Allevia Hospital are responsible for your admission, preparation and aftercare in the Cardiac Investigation Unit (CIU).

Why do I need a pacemaker implant?

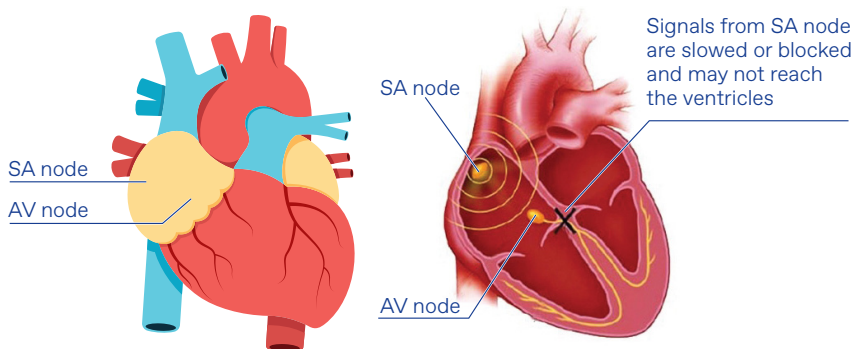
A pacemaker is a small medical device that is implanted under the skin of your chest to help manage irregular or slow heart rhythms (bradycardia). One or more leads are attached to the pacemaker that can deliver electrical impulses from the pacemaker to the heart. A pacemaker works by sensing your own heart rate and when it determines that this rate is too slow, stimulates your heart to beat. This will keep your heart rate at or above the programmed rate of the pacemaker device. The aim of pacemaker therapy is to reduce or eliminate symptoms caused by bradycardia and pauses.

What is bradycardia?

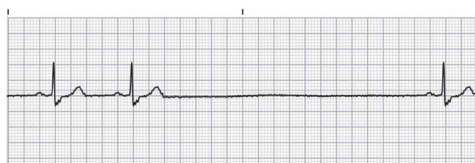
This is a heart rhythm disturbance causing the heart to beat too slowly or to pause beating. Bradycardia may cause symptoms such as fatigue, lethargy, dizzy turns, light-headedness and blackouts.

There are three reasons that cause bradycardia:

1. The heart's natural pacemaker (the sinoatrial or SA node) has become unreliable (sick sinus syndrome).
2. The electrical impulses from the SA node cannot be transmitted to the lower pumping chambers of the heart (atrioventricular or AV block).
3. An arrhythmia called atrial fibrillation can cause bradycardia.



Diagrams of the heart showing the SA node and AV node.



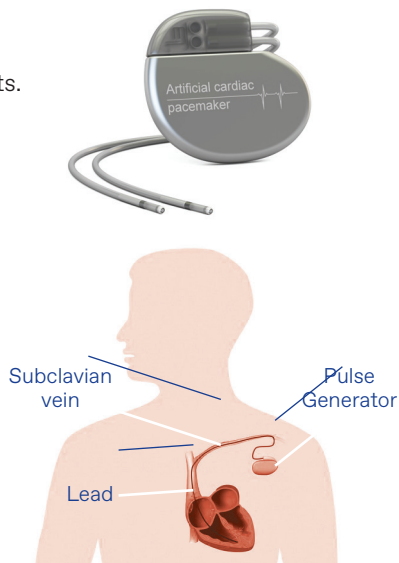
ECG showing a pause in heart beats due to the sinus node failing to fire.

What is a pacemaker?

A pacemaker system is made up of two components.

The pulse generator: the generator is a small metal case that houses the battery and electrical circuitry of the pacemaker. The generator continuously monitors your heart rhythm and rate. It delivers electrical pulses to pace your heart when it senses a slow rhythm.

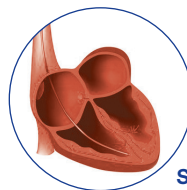
The leads: a pacemaker lead is an insulated wire that connects the pulse generator to the inside of your heart. The leads act as a two-way pathway for electrical information. Electrical signals from your heart can be carried to the pulse generator (sensing) and energy from the pulse generator can be delivered to your heart to make it beat (pacing).



Are there different types of pacemakers?

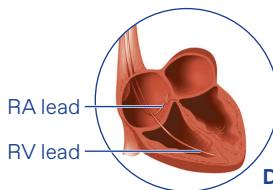
There are three types of permanent pacemakers: single chamber, dual chamber and biventricular. Your cardiologist will advise which kind of pacemaker is most suitable for you.

Single chamber: has one lead attached to it and is placed in either the right atrium (RA) or right ventricle (RV) depending on the type of abnormal heart rhythm you have.



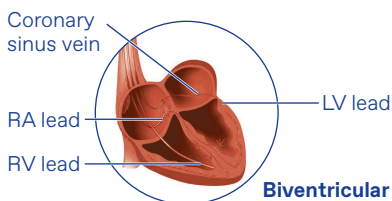
Single chamber

Dual chamber: this uses two leads. One is placed in the right atrium (RA) and one in the right ventricle (RV). The leads work together to ensure the atrium and ventricles contract in a coordinated way.



Dual chamber

Biventricular: uses three leads which pace and sense the right atrium, right ventricle and the left ventricle (LV). This ensures the atrium and ventricles contract in a coordinated way with respect to each other, as well as ensuring the left and right ventricles are synchronised too.



Biventricular

Before your procedure

Pre procedure phone call

A nurse from IntraCare will call you 24–48 hours prior to your procedure to discuss the following information:

- Your admission time.
- When you should stop eating and drinking.
- Medication instructions.
- Allergies (including medications, contrast dye, dressings/plasters and food).
- Answer any further questions.

Fasting Instructions

To ensure your safety during the procedure, it is important that you follow the fasting guidelines below:

Food – **Stop 6 hours prior** to procedure. Do not consume any of the following within 6 hours of your planned procedure time:

- Solid food
- Milk-based products
- Soluble fibre
- Jelly

Fluids – Clear (transparent) fluids are encouraged up to **2 hours before** your planned procedure time. These include:

- Water
- Clear juices
- Cordials
- Black tea or coffee

Avoid fluids containing milk, pulp, or jelly.

Sip-Til-Send (STS) Protocol*

- Unless advised otherwise, you can sip up to **200ml of water per hour** in the 2 hours before your planned procedure time.

* Your nurse will confirm during your pre-procedure phone call whether this protocol is suitable for you.

Anticoagulation (blood thinner)

If you are taking a blood thinner e.g. Dabigatran (Pradaxa), Rivaroxaban, Warfarin or Clexane, you may need to stop this medication temporarily for a day or two before your procedure.

Warfarin

If you are currently taking Warfarin, please inform IntraCare via email or phone as soon as possible. Our nurses will review your INR levels and advise any medication changes if necessary.

Other regular medications

Please continue to take these unless advised otherwise by your cardiologist. If you are taking a diuretic or water pills (e.g. frusemide, spironolactone), you may need to withhold this on the morning of the procedure. It is important that you let us know if you are taking the following medications: Liraglutide (Victoza™, Saxenda™) Dulaglutide (Trulicity™), Semaglutide (Ozempic™, Wegovy™), Tirzepatide (Mounjaro™).

Reminders for the day of your procedure

- If you are on regular medication, please bring this with you in its original packaging.
- Please leave all your jewellery and valuables at home. You are welcome to bring your mobile phone in with you.
- We recommend wearing loose-fitting clothing and shoes that are easy to slip on/off.
- You are encouraged to bring a friend or a family member as a support person before and after your procedure.
- This is commonly a day stay procedure, but please bring an overnight bag with you in case you are required to stay overnight.
- The planned procedure time is an estimate only and may vary. We will keep you informed of any unexpected delays on the day.

Informed consent

As with any procedure, there are potential risks involved. Your cardiologist and will explain the procedure, discuss possible risks and answer any questions you may have. Your whānau or support person are welcome to be part of this discussion. You will then be asked to sign the consent form. This will occur either at an earlier appointment, or on the day of your procedure.

Your procedure

Depending on the type of pacemaker, this procedure can take anywhere from 1 to 2 hours. Generally, the more leads, the longer the procedure.

Preparation

Once you are in the EP suite, the staff will perform a safety check-in to confirm your name, date of birth and the procedure you are having. A small intravenous (IV) line will be inserted into a vein in your arm for medication to be injected. We may need to remove hair with clippers at the access site for sterile preparation. Please avoid shaving the area yourself as this may cause minor abrasions to the skin, increasing the risk of infection.

Several adhesive patches, small and large will be placed on your back and chest for monitoring and diathermy if required. Other devices for monitoring blood pressure, heart rate and oxygen levels will be fitted to ensure your safety during the procedure. We will carefully position and tuck your arms at your sides to ensure that sterility and safety are maintained.

The procedure

Your chest will be exposed and prepped with an antiseptic solution where the pacemaker will be implanted. You will be covered with a large sterile drape and the chest area will be completely numbed with local anaesthetic. Local anaesthetic stings when going in, but the area quickly becomes numb.

You may feel pressure while a pocket is made under the skin for the pacemaker to sit but you should not feel any pain. If at any time you feel pain or are uncomfortable, please let your cardiologist know and more local anaesthetic or medication to help you relax can be given.

Using X-ray the pacemaker lead/s are guided into your heart via a vein just under the collar bone. The pacemaker is then connected to the lead/s and testing is performed using a pacemaker programmer to check the lead/s are in the correct place and are working. Once this is confirmed, the incision site is closed using sutures and a special skin glue.

After your procedure

You will be transferred from IntraCare to CIU, where the Allevia Hospital team will look after you in your recovery.

- A chest-xray will be taken to ensure optimal position of the pacemaker leads.
- Your pacemaker will be checked with a pacemaker programmer about four hours after the procedure to ensure the leads and device are working appropriately (this is not required if you have had a pacemaker replacement). This will be carried out by one of our Cardiac Physiologists or a Product Specialist.
- Most patients can go home after their post-op pacemaker check, usually 4–5 hours after the procedure. Very occasionally you may have to stay overnight.
- Prior to your discharge, the nursing staff will give you advice about your medication, pacemaker site care and resuming your normal daily activities.

Recovery and discharge

- It is a Land Transport Safety Authority (LTSA) requirement that you **do not drive for 2 weeks following a pacemaker implantation**. Please ensure you have a family member or friend to drive you home. If you usually drive a bus or truck, it is advisable not to drive for up to six weeks following your procedure. Please discuss your individual situation with your cardiologist.
- You will need to arrange someone to be at home with you on the day of your discharge and overnight to support you in your recovery.
- Due to the sedation, you may feel lethargic afterwards with reduced concentration. For this reason, for 24 hours after your procedure:
 - Do not do any activity requiring strength, concentration, or full alertness.
 - Do not make any legal decisions or sign legal documents.

Arm movement and exercise

- It is important you do not lift your arm above shoulder height or lift any heavy objects (>5kg) for 1 month. This may pull on the wound or dislodge the pacemaker lead/s inside your heart.
- Avoid activities requiring you to over-reach, pull, push or twist for 1 month (golf, swimming, tennis, yoga, hanging the washing, vacuuming, etc.).
- Gentle activity with the arms below shoulder height is useful to keep the shoulder joint mobile.
- You will be able to return to work within a week of having the procedure unless your job involves heavy lifting (>5kg).

Wound care (incision site)

The sutures used to close the skin incision will dissolve over 14 days and therefore do not need to be removed. There may be bruising and mild discomfort at the pacemaker site for the first few days and can be relieved with paracetamol or as instructed by your cardiologist.

If you take blood thinning medication, there may be a small amount of blood ooze from the wound in the first 24 hours. If this persists, seek medical advice.

To prevent the risk of infection:

- Keep the wound completely dry for 5 days.
- You can shower but do not submerge, soak, drench or scrub the wound.
- The skin glue will peel off by itself in 10–15 days. Please do not peel the glue off prior to this as it may cause infection or irritation.
- Do not use any ointments, soap or creams on the wound.
- Leave the wound undisturbed. Do not cover the wound with any bandages or dressings.

Medication

Your cardiologist will discuss any medication changes with you, if necessary. If you have any questions regarding your medications after your procedure, please contact your cardiologist.

Long term follow-up

You will receive an appointment from your local pacemaker clinic regarding long-term follow-up checks. Your pacemaker will need to be checked at 2 weeks, 1 month, 3 months and then every 6 months.

Please contact IntraCare or your doctor if you notice

- Any redness or swelling around the pacemaker site.
- Fever or chills.
- Excessive tenderness or pain, unrelieved with paracetamol.
- Discharge or bleeding from the pacemaker wound.
- A return of symptoms that you had before the pacemaker was implanted.
- Hiccups that will not go away.

Precautions and things to avoid

- Mobile phones – it is safe to use a phone but keep it 15cm (6 inches) away from your pacemaker site. Do not keep it in a shirt pocket over the pacemaker.
- Induction cooktops – these generate an electromagnetic field and pacemaker manufacturers recommend you keep your pacemaker site at a distance of 60cm from the cooktop. This is equivalent to about an arm's length.
- Shop or airport security systems – you may pass through security systems or metal detectors but do not linger in them. Should you set off the metal detector alarm please ensure you have your pacemaker identification card with you.
- Medical equipment – make sure all your doctors, dentists and other medical professionals know you have a pacemaker. Certain procedures such as MRI, radiation treatment, diathermy and shock wave lithotripsy can interfere with your pacemaker.
- Power generating equipment – welding equipment or high voltage transformers can interfere with your pacemaker. Ensure you are standing at least 60cm (24 inches) away from this equipment.
- Most interference will be temporary and will not permanently damage your pacemaker. If you feel unwell, move away from the source of the interference.

FAQs

Will I feel the pacemaker working?

Most people do not feel the electrical impulse, but you may feel the rate or rhythm of your heartbeat change. Often people get used to this and stop noticing.

How long does a pacemaker last?

Pacemakers last 7–15 years depending on many individual factors. Regular checks are done to monitor the battery, and you will be referred for a replacement about 3 months before the battery is depleted.

How is the battery replaced?

The pacemaker battery is sealed in the pacemaker. Therefore, the entire pacemaker is replaced. The pacemaker lead/s are unplugged from the old device and plugged back into the new one. The battery is not re-chargeable.

Will anything interfere with my pacemaker?

Most modern pacemakers are shielded and have built-in features to guard against outside interference. Therefore, it is unlikely that any general household appliances will interfere with your pacemaker. It is safe to use appliances such as kettles, toasters, electric blankets, radios, remote controls, electric shavers and microwave ovens.

Seek immediate medical attention (dial 111 for an ambulance) if there is excessive bleeding from the puncture site or if you are experiencing severe chest pain.

Please take this booklet and your discharge summary with you if visiting the GP, afterhours or hospital.

**If you have any concerns after your procedure, please contact IntraCare:
Monday to Friday: 09 630 1961 (between 6:30am and 6:00pm).
For after-hours, weekends, and public holidays, contact 027 482 0763.**

How to find us

IntraCare Epsom

Both IntraCare and Allevia Hospital will be involved with your care for this procedure.

When you arrive, please report to the Allevia Hospital Admissions Lounge (2 on the map).

Directions to the Admissions Lounge:

- From the Level 1 Carpark – Walk across the footbridge towards the main reception. Take the Yellow Lift to Level 2. The Admissions Lounge will be on your right as you exit the lift.
- From the Ground Floor Carpark – Follow the blue walkway to the Yellow Lift and take it to Level 2. The Admissions Lounge will be on your right as you exit the lift.

98 Mountain Rd, Epsom, Auckland 1023

P: +64 9 630 1961 (Monday to Friday 6:30am–6:00pm)

P: +64 27 482 0763 (after hours, weekends and public holidays)

E: admin@intracare.co.nz

W: intracare.co.nz

Where to park

A 10 minute patient ‘drop off zone’ is available on the level 1 carpark. Head up the ramp as you enter the carpark from the Main Entrance (Gate 1) on Mountain Road.

The first 30 minutes are free and apply only once the vehicle licence plate number has been entered into a payment terminal. Patient parking is available on all levels of the car park. Parking limits apply, and parking spaces are marked (P90, P180, and All Day Parking).

The Allevia Hospital parking is managed by a separate company, and a fine may be issued if your vehicle breaches any of the parking terms and conditions.

There is free 120 minute parking available nearby on Mountain Road, Gilgit Road and Almorah Road after 9am.



 Main entrance to patient and visitor car park
- 250 spaces

 Walkway to main reception
Pedestrian access to main reception from car park

 Yellow Lift

- | | |
|--|--|
| 1 Allevia Hospital reception and Allevia Radiology 1 reception | 8 Awanui Labs (blood tests) |
| 2 Admissions Lounge | 9 Allevia Radiology 2 (CT, ultrasound) |
| 3 Canopy Cancer Care | 10 The Heart Group |
| 4 ARO (Auckland Radiation Oncology) | 11 Allevia Radiology PET-CT Canopy Cancer Care |
| 5 Allevia Café and outdoor dining courtyard | 12 Allevia Specialist Centre |
| 6 Allevia Pharmacy | 13 Allevia Radiology 1 (MRI/X-ray) |
| 7 IntraCare | A B C D E Allevia Specialist Centre entrances |



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