

Information for patients with a pacemaker

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Normal Heart Rhythm

A normal adult heart rhythm is regular and usually beats around 60 to 100 beats per minute at rest. The heart has its own natural pacemaker called the sinus node, which sends out regular electrical impulses that travel through the heart's conduction system. This causes the heart muscle to contract and pump blood around the body.



Why do I need a pacemaker?

Problems with the heart's own conduction system can result in your heart beating too slowly. This can cause some patients to feel unwell and have symptoms such as dizziness, syncope/collapse and extreme tiredness.

The following conditions may require you to have a pacemaker fitted:

- **Sick sinus syndrome:** The heart's natural pacemaker (sinus node) does not function properly causing the heart to beat too slowly or too fast. A pacemaker will correct the slow heart rate and medication can be used to help prevent faster heart rhythms.
- **Heart block:** Conduction problem resulting in failure to transmit electrical impulses from the top chambers of the heart (atria) to the bottom of the heart (ventricles).
- **Atrial Fibrillation:** An irregular heart rhythm originating from the top chambers of the heart (atria). This can be too fast or too slow, or a combination of both.

A pacemaker may be implanted to prevent your heart from beating too slowly. The pacemaker cannot stop your own heart from beating too fast. Abnormal faster heart rhythms are treated and controlled with the use of medication.

How does the pacemaker work?

A pacemaker consists of a pulse generator (pacemaker box), which sits under the skin in the upper chest, and either one or two electrode leads that sit inside the heart. The pacemaker box contains the power supply (battery), electronic circuit and specialised software and memory in order to monitor your heart rhythm and rate. The electrode lead(s) are thin, insulated wires that deliver electrical impulses from the pacemaker box to the heart. Each electrical impulse sent from the pacemaker travels down the lead to stimulate the heart to contract and produce a heartbeat.

Your pacemaker may not have to work all of the time, depending on how fast your own heart rhythm is. Most pacemakers are set to work “on demand”. The pacemaker will constantly monitor your own heart’s rhythm and will only work when your heart rate goes too slow. There are many different pacemaker settings and these will be optimised to suit you during pacemaker follow up appointments. There are many different pacemakers and pacemaker manufacturers. Physicians and pacemaker technicians will select the most appropriate pacemaker for you.



There are two types of pacemakers to correct slow heart rhythms, these are:

- Single chamber pacemaker (one electrode lead)
- Dual chamber pacemaker (two electrode leads)

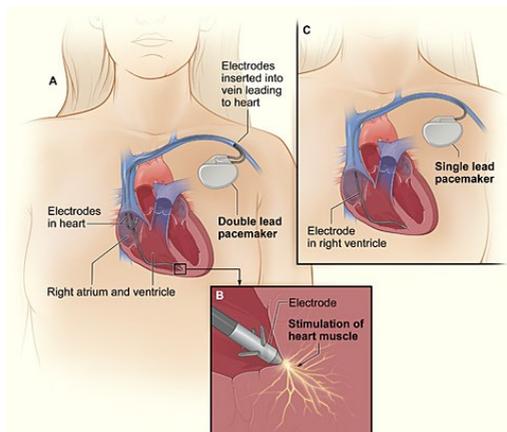
The pacemaker generator/box is contained within a protective metal casing (usually titanium).

Most pacemakers are powered by a lithium battery. Battery life can vary depending on different factors, such as what type of pacemaker you have and how much the pacemaker is being used, but can usually last between 6 and 10 years. The batteries are not rechargeable and once the battery has depleted, the pacemaker box will need to be replaced.

How the pacemaker is fitted

On the day of the procedure, you will be taken to the Radiology department. A doctor, nurse, pacing technician and radiographer will be present during the procedure. You will be asked to lie on a narrow operating table. The procedure is carried out with just the use of local anaesthetic. Sometimes very mild sedation can be given, if you feel that you need it. This will make you feel relaxed and sleepy.

The skin where the pacemaker will be implanted will be cleaned with antiseptic solution and local anaesthetic injected under the skin. The doctor will make a small incision where the pacemaker will be inserted and also locate the vein in which the electrode lead(s) will be passed through to the heart. The leads are inserted into the vein and guided to the correct position within the heart using x-ray screening. Just before the lead(s) are connected to the pacemaker box, a pacemaker technician will test them to ensure they sense your own heart's electrical signals and stimulate the heart appropriately.



During the procedure you may feel a bit uncomfortable and may feel some pushing and pulling sensations. You may feel your heart beating faster, some fluttering or palpitations might be felt, whilst the leads are being guided into place and checked.

You may also be asked to take some deep breaths in and give a cough during the checking procedures. The pacemaker box will be implanted

under the skin in either the left or right side of your chest (depending on whether you are left or right handed). Although pacemakers are now relatively small, they can sometimes still be seen underneath the skin. The incision site will then be stitched with dissolvable stitches and covered with a protective dressing. A pressure dressing may also be applied.

Changing the battery

This is a similar procedure to the original pacemaker implant, however you are usually able to go home the same day.

Are there any risks associated with the procedure?

There is a small risk of infection, bleeding and bruising to the pacemaker site. There are some other small risks associated with having a pacemaker fitted that your doctor/nurse will discuss with you in detail before you sign your consent form for the procedure.

After having the pacemaker fitted

Following the pacemaker implant you will require at least one overnight stay in hospital, where you will be monitored. You may feel some pain or discomfort and there may be some bruising around the pacemaker site. You will be able to eat and drink immediately after the procedure. You should be able to go home the following day providing the pacemaker checks are satisfactory. The pacemaker will be checked the following day and you will be taken for a chest x-ray to check the lead positions.

Most people have no problems after having a pacemaker fitted, but if you experience dizziness, breathlessness or symptoms similar to those that you may have felt prior to pacemaker implant such as syncope/collapse, you should contact your GP or pacemaker clinic.

You will be given a pacemaker identification card before leaving hospital. This will have details of the make and model of your pacemaker. It is useful to ALWAYS carry this card with you in case of an emergency.

Taking care of the pacemaker site/wound

You will need to be careful with the use of the arm nearest the pacemaker site for 4-6 weeks following pacemaker implant. You will be advised not to put too much pressure on that arm and not to lift it above shoulder level. This is to help prevent the lead(s) from moving before settling in the heart's tissue. You will also be advised on taking care of the pacemaker wound. The dressing covering the pacemaker site will need to stay on and be kept clean and dry for 5 days following implant to help prevent infection. After 5 days you can remove the dressing yourself. Stitches are dissolvable and should come out on their own; however you should contact us if you become concerned about the wound.

Will I feel the pacemaker working?

Before you leave hospital the pacemaker will be programmed to the best settings for you. These settings can be modified during follow up appointments in clinic when necessary. You shouldn't be aware of your pacemaker working, but occasionally patients may be conscious of this.

Follow ups

After the initial 4-6 week pacemaker check following implant, you will be able to resume normal movement of your arm, providing all checks are okay. You will then be given either a further 6 month or 12 month follow up, depending on your pacemaker settings. After this, pacemaker patients are then generally followed up yearly. Technicians may decrease the time between your follow up appointments if needed and this will always happen when the pacemaker battery life starts to deplete.

Is there any equipment that can affect my pacemaker?

Very strong magnets may cause electromagnetic interference. It will not damage your pacemaker but may temporarily interfere with its settings whilst you are in contact with it.

- **Magnets:** It is advised not to carry or place magnets over your pacemaker*.
- **Shop doorway security systems:** Don't hang around or wait in shop doorway security systems; just walk straight through.
- **Arc welding:** Generally this should be avoided.

*if you work with strong magnets, ask your pacemaker technician or Cardiology Consultant for advice.

Driving: You must not drive for 1 week after the procedure. Please inform the DVLA you have a pacemaker.

Travel: It is safe to travel abroad after having your pacemaker fitted. It is advisable to show airport security your pacemaker ID card. You may still be asked to walk through the airport security metal detector, which is safe to do so. The metal casing of the pacemaker may set off the alarm.

Mobile phones: You can safely use your mobile phone, but make sure you keep the phone 15cm (6 inches) away from the pacemaker. So, it is advised to use the ear on the opposite side to your pacemaker and not to place the mobile phone in a pocket over your pacemaker.

Mechanical and electrical home devices: Items such as microwaves are safe to use and will not affect your pacemaker. If electrical appliances instruct “not to use if you have a pacemaker”, this is normally stated to cover the manufacturer and not necessarily applicable. It is best to check with your pacemaker clinic for advice if you are unsure. If you start to feel dizzy, feel palpitations or experience symptoms like those you had prior to pacemaker implant it is advised that you stop using the equipment immediately.

Medical and dental equipment: Most hospital and dental equipment will not cause any problems to your pacemaker. However, it is advised you let medical/dental staff know that you have a pacemaker. It is rare that some equipment will interfere with the pacemaker. If you start to feel unwell or have symptoms similar to those you had prior to the pacemaker implant, it is advised that you stop using the equipment immediately.

MRI Scanners: Some pacemakers are MRI compatible, which means you are able to have an MRI if needed, but changes to the pacemaker settings MUST be made prior to your MRI. You will be told if you have an MRI compatible pacemaker.

Contact information

Clinical Investigations Department

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Appointments: 01935 384457

If you need this leaflet in another format, eg. large print, or a different language, please telephone 01935 383077.