

Having a leadless pacemaker to manage your heart rhythm

Cardiac Rhythm Management

Information for Patients

Last reviewed: June 2025

Next review: June 2028

Leaflet number: 415 Version: 3

Introduction

You may need a pacemaker fitted if you have a problem with the electrical pathways of your heart. This booklet aims to help you understand why you may need this device, what will happen when you come in to have it put in (implanted) and what happens when you go home.

How does the heart beat normally?

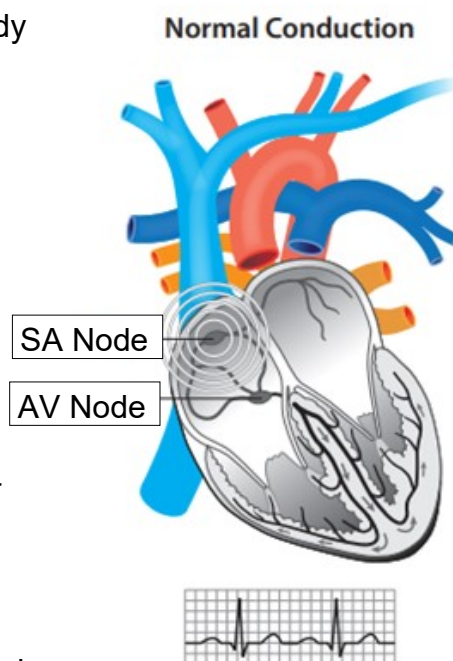
The heart is a pump. It moves your blood around your body and to your brain.

The pumping action of the heart is driven by an electrical circuit which starts from your heart's natural pacemaker. This is called the "sinus node" and sits in the right upper chamber of the heart, also called the right atrium.

The electrical signals spread through the top chambers (atria). This makes the muscle contract and squeeze the blood into the bottom chambers of the heart (ventricles).

The electrical signals are then received by the middle junction box in the heart. This is called the atrioventricular or AV node. The signals are slowed down and pass down to the bottom chambers of the heart (ventricles) through some 'conduction pathways' called bundle branches.

The bottom chambers then contract and squeeze the blood out around the body and brain from the left side, or to the lungs from the right side.



**Health information and support is available at www.nhs.uk
or call 111 for non-emergency medical advice**

Visit www.leicestershospitals.nhs.uk for maps and information about visiting Leicester's Hospitals
To give feedback about this information sheet, contact InformationForPatients@uhl-tr.nhs.uk

What is different in my heart?

If there is a problem with the normal electrical pathways in your heart, a pacemaker could help. You may be having dizziness, tiredness (lethargy), breathlessness or you may have collapsed. Some people do not have any symptoms, but a problem with the electrical pathway of your heart may be found during a routine check.

What is a pacemaker?

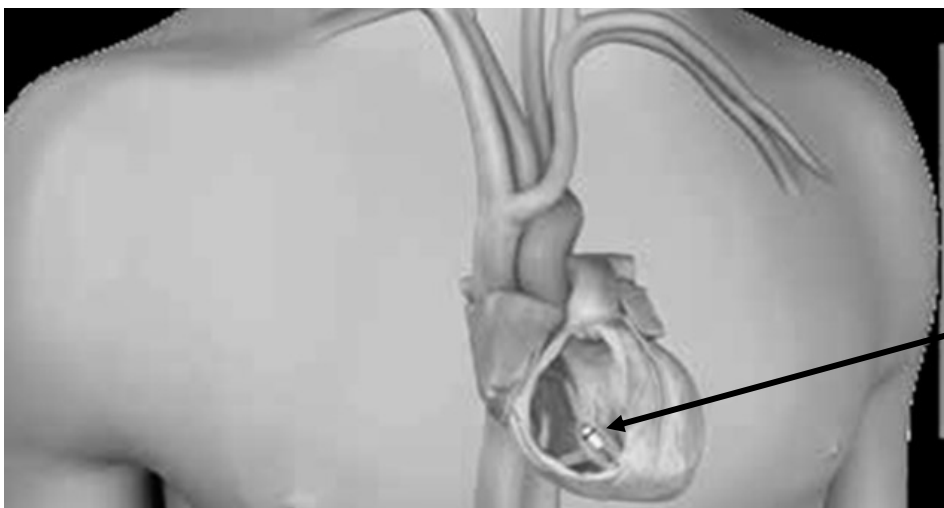
Traditional pacemakers

Traditional pacemakers have a pulse generator (pacemaker box). They are mostly placed under the skin below the collarbone and connected to **1 lead** (single chamber pacemaker), **2 leads** (dual chamber pacemaker) or **3 leads** (biventricular pacing). The leads are inserted through a vein to the heart. This allows for monitoring and stimulation of the heart (pacing).

Leadless pacemakers

A smaller self-contained type of pacemaker (leadless) is now available. It can be implanted into the heart through a vein in the leg. This type of pacemaker has no leads but has small flexible hooks which fix the device within the heart. Like a traditional pacemaker, the leadless pacemaker monitors the heart rate all the time. It will only send out electrical impulses to pace the heart when it is needed.

Your pacemaker will be set specifically for you.



Reproduced with permission from Medtronic

Before admission

Usually patients having a pacemaker fitted will be seen in the Cardiac Rhythm Pre-Admission Clinic so that you will know what to expect on the day of your procedure. At your pre-admission appointment we will talk to you about:

- your medical history and current symptoms
- the procedure
- your medication and if there are any medicines you should not take before the procedure
- when to stop eating and drinking
- Recovery
- Driving after having a pacemaker implanted

Please ask any questions that you may have.

Please bring to your pre-admission appointment:

- your current medication or recent prescription.
- your record of INR blood tests if you take warfarin.
- list of allergies (especially antibiotics, other drugs and metals).

Please also phone the Cardiac Rhythm Team on **0116 258 3848** for advice on your medication if you:

- have a procedure date and have not got a pre-admission appointment or it is **less than 7 days** before your procedure.

How do I prepare myself?

At your pre-admission appointment, you will be given antimicrobial nose ointment and body wash. Please use these as instructed for the **2 days before** your implant, and also on the day that you are coming into hospital.

Eating and drinking (fasting)

Your admission time on the day of your implant will be either 8am or 1pm. If your admission time is:

- 8am:** Nothing to eat from midnight the night before.
You can have water only, up to the time of your procedure.
- 1pm:** A light breakfast until 9am then nothing to eat.
You can have clear fluids only, up to the time of your procedure.

You will be admitted to ward 32. Please bring:

- all of your medication in the original boxes and any inhalers or CPAP machine
- if you are on warfarin, your anticoagulation booklet and readings.
- This is often a day case procedure. Please bring a small overnight bag in case you need to stay overnight.

What does the procedure involve?

The procedure usually happens under a local anesthetic, so you will be awake. You may also be given some sedation to help you feel relaxed.

On Ward 32

- When you arrive on ward 32 you will meet the nurse who will be caring for you.
- The nurse will ask you some questions and take your blood pressure, pulse, temperature. A small plastic tube (cannula) will be placed into a vein in your arm.
- The nurse will give you an antibiotic through the cannula. This is to reduce your risk of developing an infection. Please tell the nurse at your preadmission if you have had any allergic reactions to antibiotics.
- You will be asked to put on a hospital gown and paper pants. The nurse may need to remove hair from the groin area before the procedure to keep infection risk low.
- The pacemaker implant takes place in the procedure room (Catheter Lab) away from the ward. It has special X-ray and monitoring equipment.

What will happen in the procedure room (Catheter Lab) ?

1. The staff in the procedure room will be wearing theatre gowns, masks and hats as this is a clean (sterile) procedure.
2. You will be asked to lie down on the X-ray table which is narrow and firm.
3. We will attach heart monitoring and other monitoring equipment to your arms, legs and chest as needed.
4. We will clean the groin area with an antiseptic solution. A sterile drape will be used to cover the surrounding area.
5. The doctor will inject local anesthetic into the skin in your groin (usually on the right side). This allows the area to become numb before passing a tube into the vein in the groin.
6. The doctor will use an ultrasound scanner to see the tube as it passes under the skin. It goes along one of the veins and into your heart.
7. The leadless pacemaker then travels through the tube and into the heart. It is carefully placed against the middle wall of the heart (in the right ventricle) and fixed in place.

8. The leadless pacemaker is then checked to make sure it is detecting the electrical signals coming from the heart and is pacing correctly. The settings are adjusted to suit your needs.
9. The doctor will stitch close the entry site in your groin. The stitch will be removed a few hours later.
10. The pacing team will check your pacemaker team at the end of the procedure.
11. The procedure may 1 to 2 hours. If needed sedation and pain relief can be given to make sure you are kept comfortable throughout.

What happens afterwards?

After the procedure you will go back to the ward on your bed/trolley and will stay on bed rest for at least 2 hours. Please do not get up without checking with your nurse. You can usually eat and drink as normal.

Your groin area may be slightly bruised and swollen after the procedure. It is normal to feel some discomfort around that area. Please tell the nursing staff and they will offer you pain relief.

The nursing staff will encourage you to get up and start moving around after at least 2 hours. Before you go home you will have a chest X-ray and be given an appointment card for your first check up in pacing clinic in 4 to 6 weeks. You may also be seen by one of the Cardiac Rhythm nurses.

Risks and benefits of leadless pacemakers

The leadless pacemaker is a step forward in heart pacing but not suitable for everyone. They are reliable and pace the heart as needed. They have reduced some of the complications found with traditional pacemakers, especially those linked with the leads and pocket made under the skin.

The risks and benefits of having a leadless pacemaker instead of a traditional pacemaker will have been discussed with you in detail.

Traditional pacemakers

About 50,000 traditional pacemakers are implanted in the UK each year. They have been used for many years since the 1950's for slow heart rhythms. Having a traditional pacemaker is a routine procedure but there are risks which include:

- bleeding into the pacemaker pocket. This may settle in time but you may need another procedure to stop the bleeding.
- collapse of the lung. This may settle on its own but sometimes needs a small drain put into the lining of the lung to help it re-expand.
- infection of the pocket. This may mean the implant has to be taken out.
- problems with the leads moving out of place or failing to work.

These risks are low but can be serious.

Leadless pacemakers

Leadless pacemakers were first used in people in 2012. They have developed from traditional pacemakers. Unlike traditional pacemakers, they can only pace a single chamber in the heart (right ventricle). This means you can only have one fitted if you need single chamber pacing.

Leadless pacemakers have been developed to prevent some of the complications linked with traditional pacemakers.

- They are put in through a vein in the groin, this means there is no risk of lung collapse.
- As the pacemaker is not implanted under the skin in a pocket there is no risk of bleeding from the pocket or pocket infection.
- There are no leads, so there is no risk of leads moving out of place or lead failure in the longer-term.
- Leadless pacemakers do carry some risk.

What are the specific risks with leadless pacemakers?

• Infection

There is always a small risk (about 1 in 700) of getting an infection and needing to have the pacemaker taken out and replaced. We will give you antibiotics before and sometimes after the implant to help minimise the risk. We will give you advice about the signs of infection and what to look for at pre-admission.

• Groin complications

Bruising in the groin where the tube is passed into the vein is very common. In about 1 in 200 patients there may be damage to the vein and a small operation may be needed to repair it. This is more common if you are taking 'blood thinning medication' (for example, Rivaroxaban, Apixaban, Dabigatran, Edoxaban or Warfarin). If there is any extra bleeding (sometimes called a haematoma), pressure will be applied to control it. This may result in more bruising to the groin. This could last some weeks. Some people may feel some discomfort for a few days after the procedure. Taking some regular pain relief can help.

• Device displacement

There is a 1 in 700 risk that the pacemaker may move out of position. You may not know that this has happened until you come for pacemaker checks in clinic. If this happens the leadless pacemaker will need to be repositioned and another procedure will need to be arranged.

• Puncture of the heart (pericardial effusion/tamponade)

There is a 1 in 300 risk of a bleed around the heart during the procedure. If this were to happen, a small drain may need to be inserted into the lining of the heart to drain away the collection of blood. Very rarely, it can lead to the need for open chest heart surgery.

- **Radiation risk**

Ionising radiation can cause cancer which happens after many years. The risk of developing a cancer following this procedure is less than 0.001%, which is minimal. For comparison, the natural lifetime cancer occurrence in the general population is about 50%.

Depending on the length of the procedure there is a small chance of skin reddening (radiation induced erythema). We will talk to you about this after the procedure if it is a risk for you.

These risks will be discussed again with you at pre-assessment and before signing the consent form. Please ask any questions that you may have.

Going home

- **Pain relief**

You may have some pain and discomfort after the procedure. We advise you take some regular pain killers for a few days as needed. Get advice from your GP or pharmacist if your pain lasts for more than a few days.

- **Groin care**

For the 2 days after the procedure you should avoid any hot baths or showers to allow time for your groin to heal.

For the first 2 days you should limit your exercise. You will then need to avoid any strenuous exercise for at least 1 week to allow your groin to heal.

- **Signs of infection**

You need to look for signs of infection, these include:

- Redness
- Soreness or swelling that is not getting better
- Oozing
- If the surrounding skin becomes hot
- If you have a higher than normal temperature or feel unwell

If you notice any of these signs or symptoms you must contact the your GP, or call 111 as soon as possible.

Everyday life with your pacemaker

What will it feel like to have a pacemaker?

You will not feel the leadless pacemaker working or be aware of it.

When you return home you may get relief from symptoms such as light-headedness, dizziness and fainting. Some people feel they have more energy.

- **Battery**

The battery life of your device will be checked by pacemaker clinic with you attending for visits or via home monitoring. Problems with pacemaker are not common, the checks help staff to know if everything is working properly or not.

The battery usually lasts about 10 years. The battery life is affected by how much pacing the device needs to do. You will need a new device once the battery runs low. Your doctor will talk about the type of pacemaker you need.

General advice

- **Driving and insurance**

If you have a Group 1 Car/motorcyclist the DVLA guidelines state that you should not drive for **1 week** after your pacemaker has been implanted. You may wish to allow more time for you groin to heal if it is still sore.

If you have a Group 2 Lorry/Bus license DVLA states you must not drive for **6 weeks** after having your pacemaker implanted.

You must tell the DVLA and your insurance company that you have had a pacemaker implanted. Please fill in a medical survey. You can download this from the website: www.gov.uk/health-conditions-and-driving or call DVLA on 0300 790 6806 for **Group 1 Car / Motorcyclist** or 0300 790 68067 for **Group 2 Lorry / Bus**. (Information as per DVLA Guidelines, January 2024).

- **Travel**

Pacemaker devices do not often cause problems with airport security systems but, when travelling please carry your 'Pacemaker Identification Card'. We will give this to you after your procedure.

Move quickly through the security arch if asked to do so. If you need to have a hand search, make sure that the metal detector is not placed directly over your pacemaker.

- **Mobile phones**

You can safely use your mobile phone but keep it at least 15cm / 6 inches from your pacemaker. Always use the ear on the opposite side to the pacemaker. Do not place the phone in a shirt pocket over the pacemaker site.

- **Electrical equipment**

Electrical equipment that you use in the home such as well maintained microwave ovens, TV/radio device and electric tools will not cause any problems to your pacemaker as long as you use them 15cm / 6 inches away from your device. See advice below for induction hobs.



• Magnets

Some magnets may interfere with how the leadless pacemaker works. Equipment like large stereo speakers, hand held massagers and induction hobs should be kept a minimum of 60cm away from the heating zone. We advise you not to sleep on beds with a magnetic mattress or pillow as this may affect the pacemaker. For more advice contact Pacemaker Clinic directly.

• Medical and dental tests and treatments

Some hospital equipment may interfere with pacemakers. It is usually safe to have an MRI scan with a leadless pacemaker however you should always check with the pacemaker clinic or your doctor.

Contact details

If you have any questions or concerns about your leadless pacemaker or aftercare, please contact:

- **Pacing Clinic:** Monday to Friday, 9am to 4.30pm, call: **0116 258 3837** (excluding Bank holidays / answer phone available out of hours)
- **Cardiac Rhythm Nurses:** Monday to Friday, 8am to 5.00pm, call: **0116 258 3848** (excluding Bank holidays / answer phone available out of hours)

Please note these numbers are not an emergency number. Depending on your symptoms please contact your GP or dial 111; for medical emergencies call 999.

More information

Heart Rhythm Charity: Arrhythmia Alliance

Email: info@hearhythmalliance.org Tel: 01789 867501

British Heart Foundation

Website: bhf.org.uk Tel: 0300 330 3311

اگر آپ کو یہ معلومات کسی اور زبان میں درکار ہیں، تو براہ کرم مندرجہ ذیل نمبر پر ٹیلی فون کریں۔
على هذه المعلومات بلغةٍ أخرى، الرجاء الاتصال على رقم الهاتف الذي يظهر في الأسفل

જો તમને અસ્ય ભાષામાં આ માહિતી જોઈતી હોય, તો નીચે આપેલ નંબર પર કૃપા કરી ટેલિફોન કરો

ਜੇ ਤੁਸੀਂ ਇਹ ਜਾਣਕਾਰੀ ਕਿਸੇ ਹੋਰ ਭਾਸ਼ਾ ਵਿਚ ਚਾਹੁੰਦੇ ਹੋ, ਤਾਂ ਕਿਰਪਾ ਕਰਕੇ ਹੇਠਾਂ ਦਿੱਤੇ ਗਏ ਨੰਬਰ 'ਤੇ ਟੈਲੀਫੋਨ ਕਰੋ।

Aby uzyskać informacje w innym języku, proszę zadzwonić pod podany niżej numer telefonu

Previous reference:

If you would like this information in another language or format such as EasyRead or Braille, please telephone 0116 250 2959 or email equality@uhl-tr.nhs.uk