

# Pacemaker patient information



Promoting better understanding, diagnosis, treatment and quality of life for those affected by heart rhythm disorders (cardiac arrhythmias)

# Glossary

**Atria** The two upper chambers of the heart.

**AV node** Part of the electrical pathway between the atria and the ventricles.

**ECG** An Electrocardiogram (ECG) records the electrical activity within the heart.

**Ventricles** The two lower chambers of the heart, providing most of the pumping force.

**Heart block** Electrical impulses are slowed or blocked as they travel from the top to the bottom chambers of the heart.

## Important information

This booklet is intended for use by people who wish to understand more about pacemakers. The information comes from research and previous patients experiences and offers an explanation of the pacemaker procedure.

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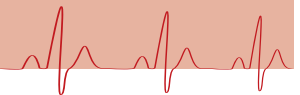
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# What is a pacemaker?

A pacemaker is a small, sealed metal and plastic device (pacemaker box), which contains a battery and electronic circuits. The device is connected to your heart by one or more wires (called leads).

These leads are passed along a blood vessel to your heart and the pacemaker box is usually implanted under the skin in your upper chest, near your collarbone. The pacemaker can monitor your heart and produce electrical impulses to treat abnormal heart rhythms. Pacemakers are largely used to treat slow heart rhythms (bradycardia), but are also used to treat some fast heart rhythms that come from the top chambers of the heart (the atria). A new type of pacemaker, the biventricular pacemaker or cardiac resynchronisation therapy, is increasingly being used to treat patients with heart failure; this is not suitable for all but can be discussed with your doctor.

Pacemakers may be single (one lead), dual (two leads) or triple (three leads) chamber and you will have the one appropriate for your underlying problem.

There are approximately 35,000 pacemakers implanted in the UK every year.

**Will I feel the treatment from the pacemaker?**

**Will I be able to stop my tablets after I have my pacemaker implanted?**

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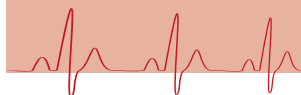
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# Why do I need a pacemaker?

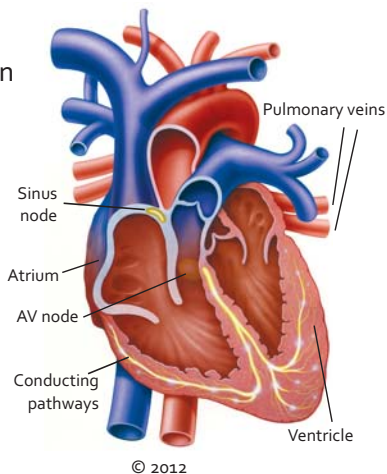
If your doctor has suggested that you have a pacemaker fitted it is because you have an abnormality in the electrical conduction system of your heart. To help you understand this, it may be useful for you to know how the electrical conduction system in your heart works normally.

The heart is a muscle; its function is to pump blood and oxygen around your body to all of your vital organs. A normal healthy heart usually beats in a regular fashion at around 50 to 100 times a minute.

It has four chambers, two at the top (the right and left atria) and two at the bottom (the right and left ventricles). The heart also has an electrical system (rather like the wiring system in your house or car), which sends impulses (beats), through the heart causing it to contract and pump blood around the body. Each normal heartbeat begins in the natural pacemaker of the heart (the sino-atrial or SA node), which lies at the top of the right atrium. It then travels across the two top chambers and down through a small junction box (the atria-ventricular or AV node), which lies between the upper and lower chambers. It then spreads rapidly through a special conducting system through the ventricles and then across the bottom chambers causing the heart to contract and pump.

Sometimes the electrical system in your heart does not work as well as it should. This can cause the heart to beat too slowly, too quickly or irregularly. A pacemaker can treat some of these abnormal heart rhythms.

## The heart and normal conduction



There are several different common conditions, which cause the heart to beat abnormally. These are:

### **Complete or intermittent heart block**

This accounts for about 60% of patients who have pacemakers implanted. This is a condition where the AV node or junction box breaks down and does not transmit the electrical pulse from the top to the bottom of the heart. This is called heart-block and may be complete or partial. When this happens the heart usually goes very slowly and you may have symptoms of dizziness or blackouts. A pacemaker is required to restore a normal heart rate and bypass the "block." This is most commonly due to the conduction system "wearing out with age", but can also occur as a congenital (in-born) problem.

### **Sick sinus syndrome**

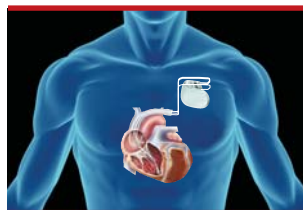
This is a condition where the natural pacemaker does not function properly and results in your heart going either too slowly or too fast or a combination of both. An implanted pacemaker is used to support the slow heart rate and medicine is usually given to control the fast heart rhythms.

Pacemakers are also used following a procedure called 'catheter ablation' that involves applying 'radiofrequency' (similar to a microwave) energy to the AV node the junction box in your heart, which destroys the cells in this area. This means that the heartbeats can no longer travel from the top to the bottom of the heart and a pacemaker is then used to deliver electrical impulses to the heart. Your doctor will inform you if you need this procedure too. You can read more about the ablation procedure in a separate A-A Patient Information Booklet entitled Catheter Ablation for Cardiac Arrhythmias.

### **Heart failure**

Some people who experience 'heart failure' (when the heart does not pump as well as it should) can benefit from having a particular type of pacemaker, which is known as a 'biventricular pacemaker' or 'cardiac resynchronisation therapy'. If you have heart failure, this therapy may improve some of your symptoms. However, not all people who experience heart failure will benefit from this treatment and careful assessment is needed before this type of pacemaker is

implanted. Your doctor will discuss this with you. There are many different types of pacemaker available to suit specific heart rhythm problems. In order to help decide which one is right for you, you may need to have some tests or investigations before the decision to have a pacemaker fitted is made. Your doctor will discuss options with you and provide you with more detailed information.



## **How is the pacemaker implanted?**

Your doctor will have explained to you why you need to have a pacemaker and how you may benefit from having a pacemaker fitted. You need to know how having a pacemaker fitted will affect you as well as what could happen to you if you do not have one fitted. This will all be explained to you and if you agree to go ahead, you will be asked to sign a consent form.

At some centres you will also be given a booklet explaining the consent form before you sign. You can discuss any needs for particular sitting of the pacemaker at this time (see below).

On the day of your procedure, you will be taken to the cardiac pacing theatre or catheter lab. Once you are in the pacing theatre, a nurse will check your details again and you will be asked to lie on a trolley or narrow operating table.

The procedure is not usually performed under a general anaesthetic, but you may be given sedation, which will make you relaxed and sleepy. Before the procedure starts, the doctor will clean the skin with some antiseptic solution and inject some local anaesthetic under the skin just below your collarbone (usually on the left side as most people are right handed, however if you are left handed your doctor may be able to implant the device on the right side). This will numb the area and allow the doctor to pass a small lead or electrode through a vein into your heart. You may have one, two or three leads inserted depending on

what type of pacemaker you need. The lead(s) are then connected to the pacemaker box. This will usually be placed under the skin on your chest wall. The area will then be stitched with dissolvable or non-dissolvable stitches. If your stitches need to be removed by your GP, Practice Nurse or District Nurse you will be informed before you leave hospital. The whole procedure should take approximately 60 to 90 minutes.

## **Are there any risks associated with the procedure?**

There are some small risks associated with having a pacemaker fitted. Your doctor/specialist nurse will discuss these with you in more detail before you sign your consent form. Generally the most common risks are;

- A small risk of infection, bleeding and bruising to the pacemaker site.
- A small risk of lead displacement – the pacemaker lead can move and would then need to be repositioned.
- A small risk of perforation of the lung during the procedure (a pneumothorax) – this is often detected on the chest X ray that is performed following the pacemaker implant and can sometimes rectify itself without treatment. Very occasionally a small drain may need to be inserted through your side into your lung (in the space between your ribs) this is a simple procedure and the drain will be removed prior to your discharge home.

# What happens after the pacemaker is fitted?

After the procedure, you will be taken back to the ward. You will be asked to lie in bed for a couple of hours then you can get up and eat and drink. Your heart rhythm may be monitored for a while to make sure that the pacemaker is doing its job, so you may be attached to an ECG monitoring device with some stickers and leads. As the wound can feel quite bruised and sore, especially for the first day or two, it is recommended that you have regular painkillers. It is very important that you tell your nurse immediately if you have any pain or discomfort at all. You may also be given some antibiotics to take before and after the procedure to minimise the risk of infection.

The wound should be kept clean and dry until it has fully healed, although it is fine to have a bath or shower after the first three or four days. Ask your nurse for a protective dressing so that you can bathe without wetting the wound. Report any wound problems to your nurse.

You will probably be allowed to go home the same or the next day provided your pacemaker is checked, there are no complications and your doctor assesses it is safe. Your pacemaker will be checked before you go home by a Cardiac Physiologist or the Specialist Nurse. This check may involve the use of a special programmer that can look at the device settings and make sure the pacemaker is working properly, or a simple magnet check and an ECG will be sufficient.

This check takes about 15 minutes and can either be done on the ward or in the pacemaker clinic. You will also have a chest x-ray to check lead positions and make sure all is well following the implant procedure. Please ask the physiologist or specialist nurse if you have any questions or worries about the device.

You will be given a pacemaker identity card, which has details of the make and model of your pacemaker. You should always carry this card with you. If you require any further treatment in the future it is important that you show this card to the health care professionals treating you.



## **Arm movements**

Extra tissue will grow around the lead(s) in your heart after a few weeks, which will prevent the wire(s) moving out of place. Try to avoid lifting the arm on the same side as the pacemaker above shoulder level or stretching it out behind your back until you have had your first outpatient check. Once you have had your first pacemaker clinic check you will be able to return to normal activity.

## **Wound site**

Your wound site should take about six weeks to fully heal. Try to avoid wearing tight clothing over the wound until it has healed completely to avoid excess rubbing over the area. If you notice any redness, soreness or swelling of the area, or any signs of bleeding or oozing from the wound, report this immediately to your GP as these may be a sign of wound infection.

You will probably be able to feel the pacemaker box under your skin as well as other lumps close by. These are the leads that are attached to the box, curled up beside the box under the skin. It is extremely important that you don't try to move the box or leads, but please let someone know if they continue to bother you.

## **Will I feel the treatment from the pacemaker?**

The device will be programmed to the best settings for you. This will be done before you leave hospital, but the settings can be modified during your follow up appointments in the clinic as and when necessary.

You should not be aware of the pacemaker working but occasionally people are conscious of their heart beating faster, particularly if you had a very slow heart rhythm before the pacemaker was implanted.

The pacemaker will not usually stop the heart from speeding up so if you had fast palpitations before then they may continue. If this occurs the palpitations are usually treated by medicine.

The pacemaker will be set to enable your own heart to work as much as possible on its own and will only come in if your heart rhythm slows down to a certain level. It works on "demand".

## **Will I be able to stop my tablets after I have my pacemaker implanted?**

This will depend on why you had the pacemaker implanted and your cardiologist will advise you what to do.

## **Safety issues**

### **Can I still drive after I have my pacemaker implanted?**

The Driving and Vehicle Licensing Agency (DVLA) have guidelines in relation to patients who require a pacemaker and whether or not they are safe to drive. There will be some restrictions but these will vary depending on why you have had your pacemaker fitted. It is very important that you discuss this with your nurse, physiologist or doctor at your pacemaker centre who will explain this in more detail. You can access the DVLA guidelines on <https://www.gov.uk/driving-medical-conditions>

You must inform the DVLA that you have had a pacemaker implanted it is also strongly recommended that you inform your insurance company.

### **Can I exercise after I have my pacemaker fitted?**

A certain level of exercise is needed to keep your heart healthy. You can take part in most sports but it is advisable to avoid contact sports to minimise the risk of damaging your pacemaker.

Following your initial recovery, normally about four weeks, it is recommended that you try to increase your level of activity if possible.

Please talk to the doctors, nurses or physiologists at your pacemaker clinic if you have concerns about physical activity.

## **Is there any equipment that can affect my pacemaker?**

Electromagnetic interference will not damage your pacemaker but may temporarily interfere with its settings whilst you are in contact with it. Most mechanical and electrical devices that you use in your normal daily activities will not affect your pacemaker. Household equipment such as ordinary radios, fridges, cookers, remote controls, televisions, electric razors, computers and microwaves etc. will not affect your pacemaker as long as they are in good working order.

If you buy an electrical appliance you may find that the instructions state “do not use if you have a pacemaker”. This statement is normally put in to cover the manufacturers and often is not necessarily applicable. It is best to check with your pacemaker clinic for advice.

If you feel dizzy or experience palpitations whilst using an electrical appliance, you should move away from the appliance and phone the physiologist, specialist nurse or doctor at the pacemaker clinic for advice.

### **Magnets**

Do not carry magnets or place a magnet over your chest. Avoid carrying stereo or hi-fi speakers as they contain strong magnets that can interfere with your pacemaker.

### **Shop doorway security systems**

It is advised that you walk through shop doorway security systems at a normal pace and not to wait around in this area.

## **Medical equipment / other hospital treatments**

Most equipment used by your hospital or GP surgery will not cause any problems to your pacemaker. However it is advised that you let medical and dental staff know that you have a pacemaker. Please take your ID card with you whenever you go to hospital. It may also be useful to contact your implanting centre for advice before you go into hospital for any investigations or operations that are not associated with your pacemaker.

## **It is safe for you to have X-rays, CT scans and mammograms.**

You should however avoid magnetic resonance imaging (MRI) machines. Some electrical nerve and muscle stimulators (TENS units) may cause interference with pacemakers but this depends on where they are being applied, and, if any of these treatments are suggested to you then your pacemaker clinic should be contacted for advice.

## **Travel**

You can safely travel abroad with your pacemaker, but you are advised to show the security staff your identification card. Walk through the metal detector archway if asked to do so, but the metal casing of the device may set off the airport security alarm. The detector will not cause any harm to your pacemaker provided you walk briskly through the arch.

## **Arc welding**

Generally, this should be avoided but can be performed under special circumstances. Please ask your pacemaker centre if you need further information on arc welding.

## **Mobile phones**

Some studies have shown that some mobile phones can affect the pacemaker if held within 6 inches of the device. It is therefore recommended that you do not keep a mobile phone in a coat or shirt pocket over the pacemaker. Keep the handset more than six inches away from the pacemaker; ideally hold the phone over the ear on the opposite side to the device. Avoid direct contact with the antenna whilst making or receiving a call.

## **Pacemaker clinic visits**

Your pacemaker should be checked regularly and you will be invited to attend your pacemaker clinic as required. You will be seen at least once a year and may be asked to attend more often if necessary. During each clinic visit, the physiologist or specialist nurse will examine your pacemaker using a special programmer. This machine allows us to examine the settings and the battery life of your device.

Special measurements are also done to assess the state of the leads that connect the pacemaker to your heart. If your condition has altered, changes may be made to the pacemaker settings using the special programmer. All the information is stored in your records.

Your wound will also be checked and you may have other tests done. Please also take this opportunity to ask any questions or let us know if you have any problems or worries.

You may also see the consultant cardiologist or their registrar at your clinic visit.

## **Changing the pacemaker**

Normally a pacemaker battery lasts between six and ten years. Your battery will be checked at every visit to the pacemaker clinic and staff at the clinic will be able to predict when you need a new pacemaker box and arrange for you to be admitted at a convenient time for you. Don't worry! It will not be allowed to completely run down.

In order to have the box changed, you will need to be admitted to hospital. The procedure is similar to having your first pacemaker fitted, but it will not usually involve having new leads put in.

# Contacting the pacemaker clinic

Most pacemaker clinics/support services run between 9am and 5pm Monday to Friday. Ask staff at your implant centre about arrangements to contact them outside these hours.

## Useful websites

A list of useful sites can be found at:- [www.heartrhythmcharity.org.uk](http://www.heartrhythmcharity.org.uk)  
This list is not exhaustive and it is constantly evolving. If we have excluded anyone, please accept our sincerest apologies and be assured that as soon as the matter is brought to the attention of the Arrhythmia Alliance, we will quickly act to ensure maximum inclusiveness in our endeavours.

If you wish to contact us direct please phone on +44 (0) 1789 450 787 or email [info@heartrhythmcharity.org.uk](mailto:info@heartrhythmcharity.org.uk)

## Further reading

The following list of Arrhythmia Alliance Patient(s) booklets are available to download from our website or to order please call +44 (0) 1789 450 787.

- Arrhythmia Checklist
- Atrial Fibrillation (AF)
- AF Checklist
- Blackouts Checklist
- Bradycardia (Slow Heart Rhythm)
- CRT/ICD
- CRT Patient Information
- Catheter Ablation
- Drug Treatment for Heart Rhythm Disorders (Arrhythmias)
- Electrophysiology Studies
- Exercising with an ICD
- FAQs
- Genetic Testing for Inherited Heart Disorders
- ICD
- Implantable Loop Recorder
- Long QT Syndrome
- National Service Framework Chapter 8
- CRT/Pacemaker
- Pacemaker
- Palpitation Checklist
- Remote Monitoring for ICDs
- Sudden Cardiac Arrest
- Supraventricular Tachycardia (SVT)
- Tachycardia (Fast Heart Rhythm)

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**Membership is free to individuals, however, if you would like to make a donation please complete and return to P.O Box 3697, Stratford upon Avon, CV37 8YL or visit [www.heartrhythmcharity.org.uk](http://www.heartrhythmcharity.org.uk) and click on donate.**

Name of taxpayer: .....

Address: .....

Telephone: ..... Postcode: .....

I would like to make a donation to A-A and enclose (cash/cheque/CAF) to the amount: £..... (Please make cheques payable to *Arrhythmia Alliance*)

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Please tick here if you agree to gift aid your subscription/donation

Please treat as gift aid donations all qualifying gifts of money made:  
today  in the past 4 years  in the future

Please tick all boxes you wish to apply.

I confirm I have paid or will pay an amount of Income Tax and/or Capital Gains Tax for each tax year (6<sup>th</sup> April to 5<sup>th</sup> April) that is at least equal to the amount of tax that all the charities or Community Amateur Sports Clubs (CASCs) that I donate to will reclaim on my gifts for that tax year. I understand that other taxes such as VAT and Council Tax do not qualify. I understand the charity will reclaim 28p of tax on every £1 that I gave up to 5<sup>th</sup> April 2008 and will reclaim 25p of tax on every £1 that I give on or after 6<sup>th</sup> April 2008.

Name: .....

Address: .....

..... Postcode: .....

### Standing order authority

My bank: .....

Bank address: .....

Please pay: Arrhythmia Alliance, Account: 02685818 sort code: 30-98-26,  
Lloyds TSB Plc, 22 Bridge St, Stratford upon Avon, CV37 6AG

The sum of £/€/£: ..... On (1<sup>st</sup> date): \_\_ / \_\_ / 20\_\_

And after this, every: ..... Month/Year (delete) Account No.: .....

Sort code: ..... Signature: ..... Date: \_\_ / \_\_ / \_\_\_\_

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Card type: ..... Expiry date: .....

Card number: ..... Amount of £/€/£: .....

Name on card: ..... CVS code (3 digit): \_ \_ \_

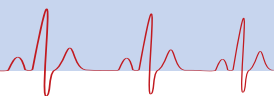
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