



If your child needs a pacemaker

The aim of this fact sheet to provide you with information if your child needs a pacemaker.

The natural pacemaker

Everyone is born with their own natural pacemaker in their heart, called the sino-atrial (SA) node. The 'SA node' is made up of cells in the right atrium (upper right chamber) and sends out electrical impulses or signals across the upper chambers (atria) making them squeeze or contract.

The electrical signals then travel down to the lower chambers of the heart (ventricles) via the 'AV node', making the ventricles contract. It is this cycle of contraction of the atria followed by the ventricles which makes the heart beat, and allows blood to be pumped to the body.

When your heart beats it pumps blood to your lungs where it picks up oxygen, and then pumps this newly oxygenated blood around the body. The electrical signals make the heart work faster when the body needs more oxygen, and more slowly when your body is at rest. This is why the cells in your heart which send out the signals are called the pacemaker.

Why would my child need an artificial pacemaker?

Sometimes a child is born with a defect in the heart which interrupts the electrical pathway. This causes an arrhythmia, the medical term for a slow or irregular heartbeat. This may be because your child:

- was born with a defective SA or AV node (heart block);
- had an illness which damaged the SA or AV node;

- is taking medication to prevent a fast heartbeat that causes the SA or AV node to work too slowly; or
- developed an arrhythmia after heart surgery which caused the electrical pathway to become blocked, or damaged the natural pacemaker.

An artificial pacemaker

An artificial pacemaker is a small, battery-powered metal box. It electrically stimulates the heart muscle in order to make the heart beat normally. The actual box weighs 22 to 50 grams and is implanted under the skin or muscle in the chest or abdomen. Attached to the box are one or more electrode leads which carry the electrical signals from the pacemaker to your child's heart.

The pacemaker is programmed to ensure that your child's heart beats a certain number of times per minute. The pacemaker does this by measuring the length of time between each beat. If this is longer than it should be (meaning that your child's heart is beating too slowly), an electric impulse is sent from the battery to the heart. The electrical impulse makes the heart contract and produce a beat.

How long will my child need a pacemaker?

At the moment, most people who have a pacemaker fitted need it for the rest of their lives.

How long will the battery last?

All being well, batteries are designed to work for a number of years. Replacing them involves a simple procedure called a box change. Your child will have regular checks to see that the pacemaker is working properly (called a pacing check). As a child gets bigger, the wires from the battery to the heart may need to be replaced with longer ones.

Are there any alternatives?

Sometimes medication can be used instead of a pacemaker, but this is generally not as effective.

Is the pacemaker implant painful?

The pacemaker implant is performed under general anaesthetic. After your child recovers from the anaesthetic, they are likely to experience some soreness around the site where the pacemaker was inserted. Your child may be given painkillers to help. Once the scar from the implant is healed, your child should not have any discomfort at the site.

How do we know the pacemaker is working properly?

Your child's pulse rate should not fall below the rate shown on his or her pacemaker card. If you are not sure how to take your child's pulse, your GP's practice nurse, health visitor and most other members of the medical profession will be able to show you.

Remember there are times when your child's pulse rate may be higher than the minimum rate. If necessary, the pacemaker's settings can be reprogrammed, without the need for surgery, during routine checks.

What restrictions will my child have?

Your child's doctor will talk to you before you go home about when your child can return to their normal activities. The pacemaker should allow your child to be as active as other children, if they are otherwise healthy.

Your child should avoid contact sports, which may cause the site of the implant to be knocked, such as boxing or rugby. Ask the doctor if there are any other restrictions placed on your child by his or her heart condition.

Will anything interfere with the pacemaker?

Ask the cardiologist for a pacemaker booklet - this will normally explain what types of appliances may interfere with the pacemaker function. Most everyday electrical items, such as microwaves, drills and office equipment will not interfere with modern pacemakers.

However, some precautions include:

- Magnetic Resonance Imaging (MRI) scanning is not allowed;
- The pacemaker may set off some types of alarms, e.g. airport alarm detectors – your child should show his/her pacemaker card;
- Mobile phones should not be placed over the pacemaker site;
- Avoid placing magnets over the pacemaker site. This is not dangerous but it may be uncomfortable. Mention the pacemaker to a dentist or doctor who is likely to administer any treatment using electrical or magnetic equipment.

More information

You may wish to borrow a video from the Children's Heart Federation called 'Ablation, pacemaker and closing an ASD with a device' (**Freephone Infoline – 0808 808 5000**), or ask to see a copy at your paediatric cardiology centre.