LIVING WITH YOUR CHILD'S PACEMAKER

ST. JUDE MEDICAL™

MORE CONTROL. LESS RISK.

Pacemakers–At a Glance

- The heart is a muscle about the size of your fist and has a complex electrical system. It generates its own electricity, which causes it to contract and relax in the proper timing sequence, pumping blood to the body.
- For the heart to work correctly, the chambers must beat in a coordinated manner at a resting heart rate between 60 and 100 beats per minute.
- Electrical signals can become blocked or irregular, causing the heart to beat too quickly (tachycardia) or too slowly (bradycardia).
- Pacemakers are miniaturized computers about the size of a couple of stacked silver dollars. They are implanted underneath the skin in the abdomen or chest area.
- A pacemaker monitors the heart's rate (how fast it beats) and provides electrical stimulation when the heart does not beat or beats too slowly.
- To provide support, the pacemaker sends a tiny electrical pulse down a wire or wires into the heart, stimulating the heart to beat.
- The pacemaker also stores information about the heart, which can be retrieved by your child's doctor. This helps his or her doctor to program the settings of the pacemaker to provide the best therapy for your child's needs.
- Pacemakers cannot be damaged by properly operating household appliances, such as microwave ovens.
- Pacemakers can help people to enjoy longer, more productive, happier and healthier lives.

Frequently Asked Questions

Living with your child's pacemaker.

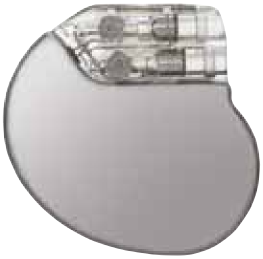
Since the first fully implanted pacemaker in October of 1958, more than 2 million people have benefited from pacemaker therapy. Though pacemaker implantation is more common in adults, it is safe for patients of any age–from infancy to late adulthood. In fact, advancements in technology have made pacemakers more appropriate for pediatric use, resulting in an increasing number implants among children over the years.

Why does my child need a pacemaker?

The heart has a complex electrical system. It actually generates its own electricity, which causes it to contract and relax in the proper timing sequence, so that it can pump blood to the body. Electrical signals can become blocked or irregular, causing the heart to beat too slowly (bradycardia). For the heart to work correctly, the chambers must beat in a coordinated manner at a resting heart rate between 60 and 100 beats per minute. There are two common causes of bradycardia: sick sinus syndrome, which is a disease of the sinoatrial (SA) node, the heart's natural pacemaker, and heart block, which occurs when the upper chambers (atria) and lower chambers (ventricles) are not coordinated, resulting in atrioventricular (AV) block (also commonly called heart block). These conditions can cause the heart to beat too slowly, either occasionally or all the time. In both cases, the heart might not pump enough blood to meet the body's needs. As the heart rate declines, there might not be sufficient blood flow, causing shortness of breath and fatigue.

How does a pacemaker work?

Pacemakers are actually miniaturized (about the size of a couple of stacked silver dollars), battery-powered computers that are usually implanted underneath the skin in the abdomen or chest area. To provide electrical support, the device sends a tiny electrical pulse down a wire, called a lead, into the heart, which stimulates the heart to beat. These impulses are very tiny, and your child should not feel them at all.



While the device keeps the heart from beating too slowly, it is also storing a lot of information about the heart. This information can be retrieved by your child's doctor, and it helps him or her to program the device in a way that provides your child with the best therapy for his or her condition.

Are there different kinds of pacemakers for different activity levels?

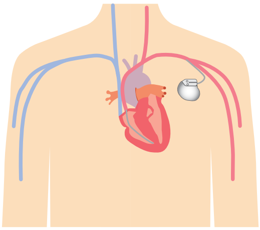
Today's pacemakers have the capability for their settings to be adjusted by your child's physician in order to provide appropriate support for a wide range of lifestyles and activities. Your child's doctor can guide you in what activities are appropriate for your child, be it swimming, bike-riding and such– and can help provide your child with a device that meets both his or her medical and activity needs.

How is a pacemaker implanted?

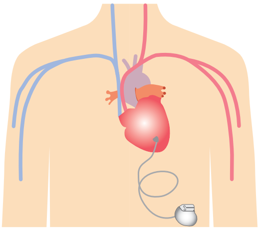
For very young children, pacemaker implantation is often done in the transthoracic method (across the thoracic [chest] cavity). This means that surgery takes place in the operating room under general anesthesia. The device is placed in the abdominal area, and the lead or leads are attached to the surface of the heart muscle.

Older children might have the device placed in a transvenous (through the vein) method. With this procedure, general anesthesia or conscious sedation may be used. With this method, the device is placed in the chest area and the leads are placed inside the heart.

Your child's doctor will determine which implantation method is best.



Endocardial Approach
(transvenous)



Epicardial Approach
(transthoracic)

What happens during surgery to implant a pacemaker?

If your child is having the pacemaker implanted, he or she shouldn't eat for six or more hours before the operation. With the transthoracic (also called epicardial) method, surgery, the doctor attaches the lead to the outside of the heart. The other end of the lead or leads is connected the the pacemaker, and it is placed in a pocket under the skin in the abdomen.

If the implant is being done with the transvenous (also called endocardial) method, the leads are guided through the vein and attached to the inside of the heart. The surgical team monitors the placement of the lead using a large overhead monitor called a fluoroscope. This is a kind of moving x-ray picture. Once the lead tip is in place, the other end is connected to the pacemaker, and it is placed in a pocket under the skin in the chest.

The prominence of the scar and device depend upon the type of procedure, and the age and size of your child. For children who are small or thin, the device might be more noticeable.

The length of the surgery depends on what kind of device your child is getting, as well as his or her specific anatomy and the time it takes to locate a good position for the lead. Implanting a pacemaker can take a number of hours.

What risks are associated with having a pacemaker?

Because pacemaker implantation is surgery, a small number of patients will develop complications, which may include infection, a reaction to a drug used during surgery, or blood loss or damage to a blood vessel, the heart wall or lung. These complications can usually be corrected or cured, but may require a repeat operation or a longer than normal hospital stay. After the surgery, your child may feel some discomfort, and he or she may be tired. As your child recovers, he or she should feel better.

Your child's doctor will discuss with you all the precautions your child should follow. Also, read completely any literature that came with the device, and pay close attention to sentences that are labeled with the word "warning" or "important." Those sentences contain important safety information. Finally, remember these are man-made devices. It is important to monitor the device regularly with follow-up visits as often as your doctor recommends.

What happens after the surgery?

Right after the surgery, your child will be taken to a recovery room. He or she may experience some tenderness at the implant site for a while. Your child may stay in the hospital several hours or several days. You should discuss the specifics of your child's case with your child's doctor.

In the period after surgery, follow all doctor instructions carefully. Some redness, soreness or tenderness around the implant site is normal. If you are already back home when you notice redness, draining from the incision and/or fever, call the doctor immediately—do not wait for your next appointment.

How can I help my child prepare for surgery?

Depending upon the age of your child, there are some things that might be helpful in preparing him or her for surgery and doctor's appointments. Some parents have found role-playing helpful, pretending that they are visiting the doctor and telling the child what they can expect. It might be tempting not to tell your child the truth about what to expect, but honesty can be important in maintaining trust. That said, give your child age-appropriate information, and only as much as he or she can handle. Using a stuffed animal with a bandage on the chest or abdomen and/or involving siblings in the child's care might also be useful strategies.

How long will it take my child to recover?

It is difficult to be specific about your child's recovery because every patient is different. Follow the doctor's instructions carefully. Your child's activities will be restricted for a period following surgery. His or her doctor is your best source of advice on the subject of resuming your normal activities.

How often will my child need to see the doctor once the pacemaker is implanted?

Your child will be asked to see his or her doctor regularly for routine checkups.

Your child's doctor will arrange for an office visit after the pacemaker implant. Doctor visits are important; they allow the physician to be sure your child's device is working properly. Sometimes minor adjustments are required, which can be done painlessly in the doctor's office using a tabletop computer called a programmer. The doctor will also want to check the incision to see how it is healing.

After that, the doctor will want to see your child for regular follow-up visits. He or she will advise you how often your child should be evaluated because it varies by patient and condition. Your doctor may also perform regular x-rays to watch your child's pacing system as her or she grows.

What happens during a follow-up appointment?

The follow-up is completely painless and usually takes less than half an hour. During this time, the doctor or nurse will put a wand over the spot where the device is implanted. The wand is about the size and shape of a computer mouse.

For some devices, a wand is not used; the information is sent wirelessly. The device tells the programmer about the battery status, performs other system checks and can report on your child's heart activity since his or her last follow-up.

The doctor can also alter certain settings on the device to adjust your child's therapy, if needed. For these reasons, it is very important that you keep your child's follow-up schedule with his or her doctor.

How will my doctor change the batteries in my device?

Implantable devices are powered by special batteries that are made to last a long time.

These batteries do not suddenly wear out, like flashlight batteries, but they give plenty of warning that they are reaching end of service.

Your child's doctor will monitor the battery as part of the regular device check-up. Most device batteries last 5 to 10 years although it depends on the device and how often it sends electrical impulses to the heart.

When the device indicates a low battery, your child's physician will arrange for a replacement. Implantable devices are sealed shut, so the batteries are not replaceable. Instead, the doctor will implant a new device. Sometimes the doctor can use the leads that are already in place, and sometimes new leads need to be placed.

Will a pacemaker change my child's life?

The truth is that your child could experience a happier, healthier and more active life. After surgery, he or she will need to take it easy for a while. Be sure to carefully follow all of his or her doctor's instructions. But pretty soon, you might notice that your child can do things he or she used to do—and even more.

Does my child have to stay away from things like microwaves, magnets or strobe lights?

Implantable devices cannot be damaged by using properly operating household appliances, such as microwave ovens, electric blankets and most power tools. Exposure to electric arc welders or being in close proximity to someone who is working on automobile ignition systems also will not damage pacemakers; however, there is a possibility that these things may briefly interfere with proper pacemaker operation.

If you have concerns about your child's exposure to electrical equipment, talk to his or her doctor. You might also contact the device manufacturer for guidance. Most manufacturers have engineers who can determine if the electrical field generated by the equipment can interfere with the pacemaker.

What if my child is going into a hospital or clinic?

Tell the hospital personnel that you your child has a pacemaker before he or she undergoes any medical procedure, such as electrosurgery, electrocautery, external defibrillation, lithotripsy or radiation therapy, or a dental procedure or test. Do not enter areas that have a "no pacer" symbol posted.

Your child also should not undergo any diathermy procedure, even if the pacemaker has been turned off. It could cause damage to the tissue around the implanted electrodes or permanent damage to the pacemaker.

Can my child use a cell phone?

Cellular phones, which send electromagnetic signals, can interfere with proper device operation. However, simple precautions—such as not carrying the cell phone in a pocket directly over the pacemaker and holding it to the ear that is farthest from the pacemaker—minimize the risk. St. Jude Medical has put special filters in their pacemakers to prevent cell phone interference.

Will an iPod® music player or other portable multimedia player interfere with my child's pacemaker?

There is no indication that compact multimedia players, such as iPod products or MP3 players, interfere with the normal

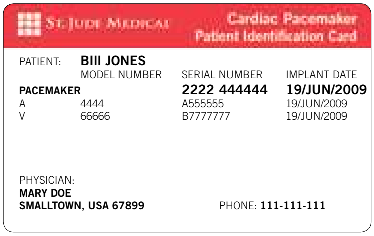
function of a St. Jude Medical pacemaker. Some limited data suggests that during device evaluation in the hospital or in a clinic, use of one of these players within approximately 12 inches of the implanted pacemaker and programmer wand could disrupt the communication between the programmer and the pacemaker. Again, this interference is only observed when the multimedia player is within 12 inches of the implanted pacemaker and the programmer's telemetry wand. This causes a distortion on the programmer screen, but it has absolutely no effect on the implanted pacemaker.

Your child should simply turn off the multimedia player during a follow-up session, or move it and any earphone wiring more than 12 inches from the programmer wand, to avoid this interference.

Though there is no data that carrying a multimedia player device affects a pacemaker's ability to function, it is nonetheless recommended that these portable players should not be carried or held directly over the pacemaker.

Why does my child need an identification card?

As a device patient, your child should wear medical jewelry, such as a bracelet, that alerts people to the presence of his or her device. You should also be sure to tell his or her other physicians, dentists and healthcare professionals that you he or she has a pacemaker. Some manufacturers will send you an identification card that should be carried by your or your child. If you do not receive a card in the mail, ask your child's doctor what information you should carry to identify your child as having an implanted device.



St. Jude Medical

Cardiac Pacemaker
Patient Identification Card

PATIENT: **BIII JONES**

	MODEL NUMBER	SERIAL NUMBER	IMPLANT DATE
PACEMAKER		**2222 444444**	**19/JUN/2009**
A	4444	A555555	19/JUN/2009
V	66666	B7777777	19/JUN/2009

PHYSICIAN:
MARY DOE
SMALLTOWN, USA 67899

PHONE: **111-111-111**

When can my child resume physical activities?

Your child's doctor will let you know when it is safe for him or her to resume activities. It is important that you avoid bumping or hitting the area around the implant, so ask your doctor about contact sports, like football. Your child's energy level may increase after he or she receives the device, and many people of all ages find they are able to do more physically than they were before because their symptoms have improved.

Can my child participate in strenuous activities like hiking, skiing or jogging?

It is always best to discuss your child's plans with his or her doctor. The doctor can advise as to your child's limits or signs that your child might be engaging in activities that are too strenuous. If your child is older and participates in a particular activity that affects his chest or arm (shooting or archery, for example), you might want to discuss this with his or her doctor before receiving the device. It may affect how the device is selected and where and how it is implanted.

Will having a pacemaker impact a teenager's ability to get a driver's license?

Talk to your child's doctor about driving. Having a pacemaker implanted should not affect your teenager's ability to drive, but it is best to discuss driving with his or her physician.

Can my child travel?

Again, your child's physician is your best resource for the answer to this question. Many pacemaker patients and their families, however, find that with some extra planning and care, they can enjoy touring to many locations. It is important to remember to carry your child's pacemaker identification card with you when you travel.

Will airport security interfere with my child's device?

Though many patients and their families worry about airport security systems, there is really no need for concern. It is true that airport security has been tightened, but this does not place an added burden on you in terms of your child's pacemaker. The best thing to do when you reach airport security is to have your child walk through the metal detector at a normal pace. If the alarm sounds (it may or may not), it only means that the system detected the metal in your child's device. Simply show your child's identification card. Ask for a hand pat-down search. Security personnel may perform a search with a handheld wand. If so, it is important to tell them that the search should be done quickly and that they should avoid holding the wand over your child's implanted device for more than a second.

What other considerations are there for travel?

Remember that, while traveling, it is important that you or your child has important medical information, such as medication names and dosages, his or her physician's name and phone number and how to care for him or her in an emergency.

You can also ask your physician for a copy of the final printout from the programmer associated with the testing results and settings at your child's most recent evaluation. If your child is going to a non-English-speaking country, his or her physician might also be able to give you a printout in the language of the country he or she will visit. (Programmer printout are available in French, Italian, German, Spanish, Japanese and Chinese.)

If your child takes prescription medication, you should be sure to have enough medication for the trip. Always carry prescription medication in your carry-on luggage when traveling by plane or train.

Important Information

Implantable device manufacturer:

Device make and model number:

Implanting physician:

Implanting physician phone number:

Implantation date:

Hospital where implant was performed:

Attending physician:

Attending physician phone number:

Medications:

Name	Dosage

My additional notes and questions:

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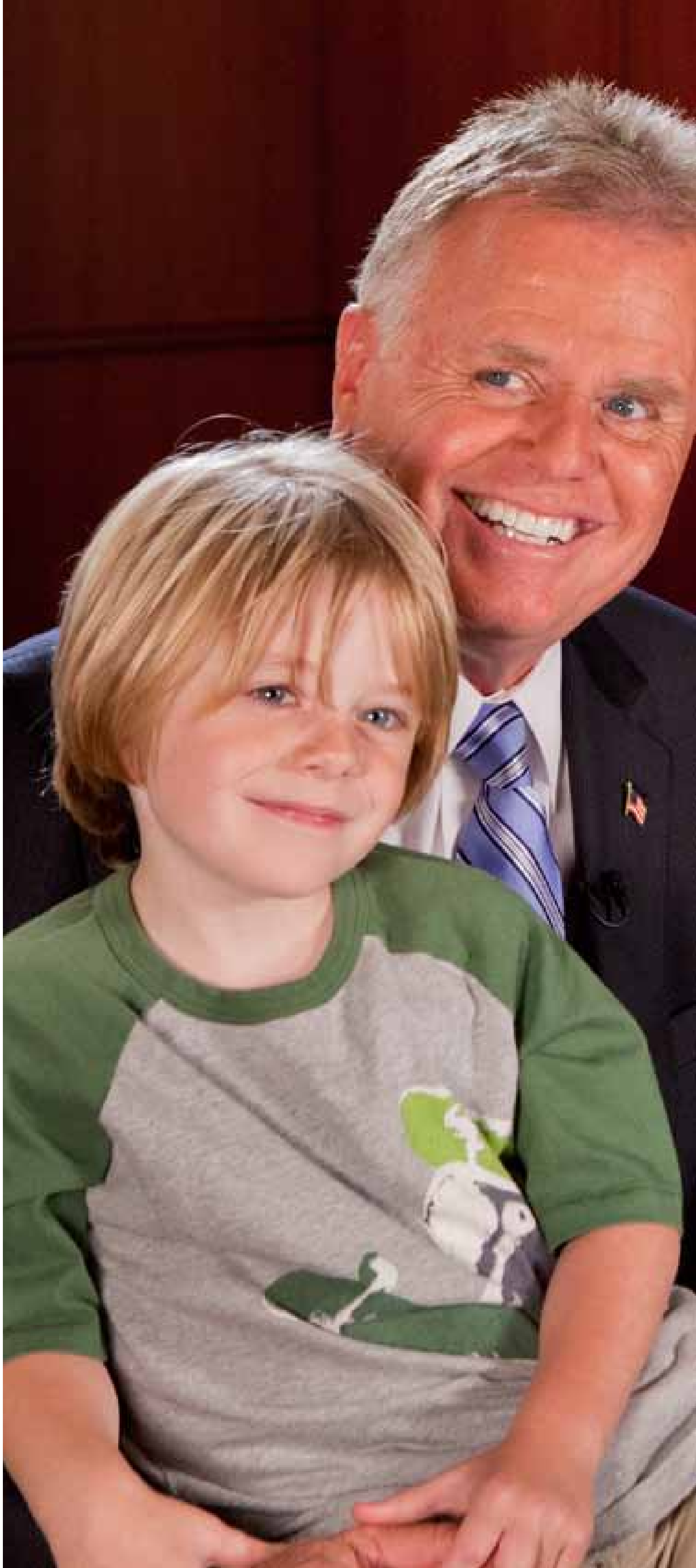

My follow-up questions:

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CAUTION : FEDERAL LAW (USA) RESTRICTS CARDIAC ARRHYTHMIA MANAGEMENT DEVICES TO SALE, DISTRIBUTION AND USE BY OR ON THE ORDER OF A PHYSICIAN.

Brief Summary: Please review the appropriate literature accompanying the device for a complete listing of warnings and precautions.

This pamphlet is for general information only and is not intended to replace the literature accompanying the device.