



Living with your Pacemaker

A Patient's Guide to Understanding Cardiac Pacemakers



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Your Contact and Device Information

Have your doctor or nurse complete the information on these pages before you go home from the hospital.

Physician Name

Phone Number

Address

Hospital Name

Phone Number

Address

Device Model Number

Serial Number

Date Implanted

Description

Physician Instructions

Congratulations on Your Device

You have just received—or you're about to receive—a remarkable little device that can improve the quality of your life and may even save your life. It's called a Pacemaker but it's also known as a "cardiac pacemaker." It helps to keep your heart pumping regularly and on time.

Invented in the 1950s, these amazing devices—about the size of a pocket watch—send small pulses of electricity to the heart to help it beat normally. The devices are run by tiny computer chips and sophisticated software. They are powered by batteries that last for years. Millions of people have had these devices implanted, helping them lead normal, full lives.

This booklet will answer many of your questions about your Pacemaker. It will also tell you how the surgery is done and how to prepare for it. You'll also find out what happens after the operation, and how to avoid problems when you're living with your device.

After reading this booklet, if you still have questions, discuss them with your doctor.

If you come across a word you do not understand, you can find its definition in the Glossary.

The Healthy Heart

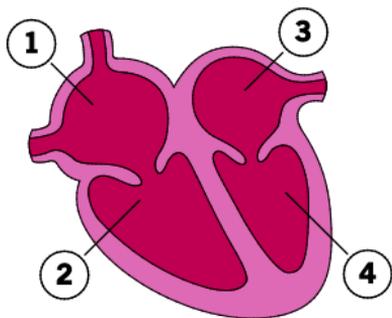
Why is the heart sometimes called a pump?

The heart's job is to move blood around the body. Blood contains the oxygen that the organs and tissues need to do their work. The blood cells pick up oxygen in the lungs and the pumping action of the heart moves this oxygen-rich blood to the rest of the body.

What does the heart look like?

As shown in the figure below, the heart has four chambers. When it is at rest, the chambers fill with blood. With each heartbeat, the heart squeezes blood out into the body.

Figure 1. A typical heart



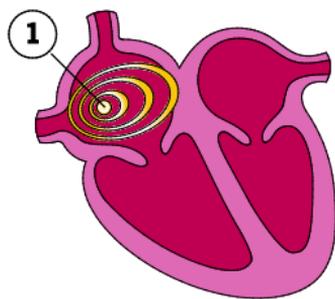
1. Right Atrium
2. Right Ventricle
3. Left Atrium
4. Left Ventricle

How often does the heart beat?

A normal heart beats 60 to 100 times each minute.

When you exercise, get excited, or experience stress, your body needs more oxygen. Your heart beats faster to keep up with the demand. How fast it beats is controlled by a small area in the upper chamber of your heart. This area is the heart's "natural pacemaker" and is called the sinoatrial (SA) node. It sends out an electrical signal that causes your heart to beat. The figure below shows the location of the SA node.

Figure 2. The sinoatrial (SA) node

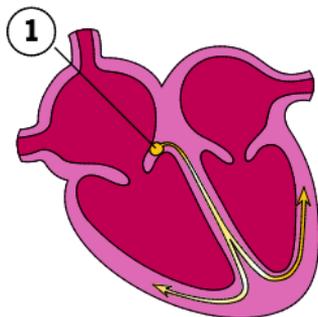


1. SA Node

What is the AV Node?

The atrioventricular (AV) node is another specialized area in the heart, located between the upper and lower chambers of your heart. It holds the electrical signal from the SA node for a fraction of a second before releasing it into the ventricle. The result is that the atrium beats first, pushing blood into the ventricle, and then the ventricle beats after it has been filled with the blood from the atrium. The figure below shows the location of the AV node.

Figure 3. The atrioventricular (AV) node



1. AV Node

Arrhythmias

What is an arrhythmia?

An arrhythmia is any heart rhythm that is "abnormal." It may be considered abnormal if it is too fast, too slow or starts somewhere in the heart other than the SA node.

What causes the different kinds of arrhythmias?

Bradycardia

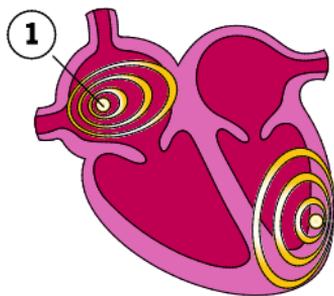
Damage to the SA node or blockage of its electrical signal can cause the heart to beat too slowly. This is called *bradycardia*. A person with bradycardia may feel very tired because their body is not getting enough oxygen. They may also feel light-headed or dizzy. Pacemakers correct bradycardia by speeding up the heartbeat to a more normal rate.

Ventricular Tachycardia

Sometimes the heart beats much too fast. This is a serious condition called ventricular tachycardia (VT). As shown in the figure below, VT is caused by signals that come from the heart's lower chamber instead of from the SA node. During VT, the heart beats so fast that its chambers cannot completely fill with blood between beats. Therefore, less blood and oxygen are pumped through the body, causing dizziness, fainting, or even cardiac arrest.

Doctors and paramedics can stop VT with medication or with an electrical shock. Sometimes the heart's normal rate returns without treatment.

Figure 4. Ventricular tachycardia (VT)



1. SA Node

Atrial Fibrillation

This is the most common arrhythmia in older people. In atrial fibrillation, the upper chambers of the heart are quivering (or "fibrillating") and the signals sent to the lower chambers are irregular and erratic. Some people may not feel any effects of atrial fibrillation. But in many people, this arrhythmia causes a feeling of pounding or fluttering in the chest. It may make people feel tired, sluggish, dizzy, or short of breath. More serious is the fact that atrial fibrillation can cause a blood clot inside the heart that

can flow to any part of the body, where it can cause a stroke or embolism.

Doctors can treat atrial fibrillation with a combination of surgery, medications, and defibrillation. Pacemakers can also be used to treat some patients with atrial fibrillation, depending on the cause and type of arrhythmia.

Asynchrony

Besides beating too fast or too slow, the heart can also beat irregularly (out of sequence). For example, one side of the heart may contract sooner than the other side. When this happens, blood and oxygen are not delivered fast enough to the body and the pumping mechanism begins to fail. If blood is not pumped out of the lungs and the body, it backs up, causing congestion like a traffic jam. This can lead to a serious condition called *congestive heart failure* (page 48).

What is heart failure?

In some patients, the heart's pumping mechanism begins to fail. Blood and oxygen are not delivered fast enough for the body's needs.

This condition is usually treated with medications, but in some cases, a special kind of Pacemaker can be used to help in the treatment.

Some Basic Facts About Pacemakers

What is a Pacemaker?

A Pacemaker can recognize a problem with your heart's rhythm and send out its own electrical pulse to make your heart beat regularly and on time. (A Pacemaker generates or makes a pulse.) It is made up of computer chips and a small, but long-lived battery in a sealed case.

The Pacemaker is surgically implanted in the

upper chest. See Surgery for the Pacemaker (page 19). The pulse it generates is sent through special wires called leads, normally placed inside the heart. The leads also help the Pacemaker sense the heart's rhythm. This is important because the device must send out its pulse at a precise moment.

Why do I need a Pacemaker?

If you have a slow or abnormal heart rate that causes fainting, dizziness, tiredness, shortness of breath, palpitations, or loss of consciousness, you may need a Pacemaker. The heart 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. A Pacemaker provides electrical stimulation when the heart does not beat or beats too slowly. In many cases, a Pacemaker can help your heart beat properly.

How does the Pacemaker know when to pulse?

The Pacemaker can sense the heart's rhythm. It can be "programmed" to either send out a pulse or to wait for the heart to beat on its own. Pacemakers have the capability for their settings to be adjusted by your physician in order to provide appropriate support for a wide range of lifestyles and activities. Some Pacemakers also sense the patient's activity — for example, climbing stairs or exercising — so that it can speed up or slow down the heart rate. Your doctor can help provide you with a device that meets both your medical and lifestyle needs.

After a Pacemaker is inside the body, its settings can still be adjusted. Doctors and clinicians "talk" to it with a *programmer*. This is a computer with a wand that sends signals through the body to the Pacemaker. The procedure is painless. The programmer also displays information the Pacemaker has

collected about the heart.

What does a Pacemaker feel like?

Most people can't feel it at all. The electrical pulse of a Pacemaker is very small. If you do feel a pulse, your doctor or clinician may change the settings to make you more comfortable.

What happens when the battery runs down?

A Pacemaker normally lasts from five to ten years. How long it lasts depends on the type of battery, how often it sends a pulse, the patient's medical condition, and other factors.

The battery does not suddenly stop working. It gradually runs down over a period of months, usually with more than enough time to schedule a replacement. Doctors and clinicians check the battery at each follow-up visit. When the battery energy gets low, the Pacemaker has to be replaced with a new one, and you must have another surgery.

What happens if a lead needs to be replaced?

If a lead needs to be replaced, surgery is required.

Types of Pacemakers

The first Pacemaker in the 1950s was the size of a hockey puck. Its battery lasted less than a year. Today, Pacemakers are much smaller. They now can stimulate up to three chambers of the heart and their batteries typically last between five and ten years.

The simplest Pacemakers today are called *single-chamber* Pacemakers because they are connected to one lead in one chamber of the heart, usually the right ventricle.

Dual-chamber Pacemakers have two leads: usually one in the right atrium and one in the right ventricle. They are able to sense and pulse in both chambers.

Some St. Jude Medical™ Pacemakers have three leads: one in the right atrium, one in the

right ventricle and one for the left ventricle. These can help the left and right ventricle beat at the same time (*resynchronize* the beats) for those people whose left and right sides may not beat together.

Any of the Pacemakers described above can also be *rate-modulated*. That means the Pacemaker can speed up when the patient becomes more active and slow down when the patient is resting. Also known as "rate-responsive" or "rate-adaptive," this type of Pacemaker has a sensor so it knows when the patient is moving. For example, a rate-modulated Pacemaker will speed up when a person jogs. When the person stops to rest, the Pacemaker slows the heart rate.

Risks and Benefits

Pacemakers are not a cure for heart disease. They don't treat the causes of slow or irregular heartbeats. But because they can maintain proper cardiac rhythm, Pacemakers can greatly improve the quality of life for people

with arrhythmias.

What are the benefits of having a Pacemaker?

A Pacemaker monitors the heart's rate (how fast it beats) and rhythm (the pattern in which it beats) and provides electrical stimulation when the heart does not beat or beats too slowly.

Many patients get relief from symptoms such as light-headedness, dizziness, and fainting. Some people feel they have more energy.

A Pacemaker also gives many patients "peace of mind." They can help people to enjoy longer, more productive, happier and healthier lives.

What are the risks of having a Pacemaker?

A small number of patients develop complications from the operation to implant the Pacemaker and the leads in the body. These can include infection, a reaction to a

drug used during surgery, blood loss, or damage to a blood vessel, the heart wall, or other organ. These complications can usually be corrected or cured.

After the surgery, you may feel some discomfort or feel tired, but these feelings only last a short time. Some patients, however, may continue to feel a bit uncomfortable in the area where the Pacemaker was implanted.

Modern Pacemakers have many safety features. Sometimes, a Pacemaker may not act properly because it is being affected by outside sources of electromagnetic energy (page 30).

It is also possible for the tip of the lead to shift in the heart so that the pulse is no longer effective. Very rarely, the device may slip out of the "pocket" in the chest. See Surgery for the Pacemaker (page 19).

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.

Contact your doctor if:

You notice you are tired, short of breath or your heart rate is changing.

You notice the wound is red, hot, swollen, more painful, or beginning to drain fluid.

Symptoms you had before the Pacemaker was implanted seem to return.

Surgery for the Pacemaker

What will surgery be like?

Surgery to implant a Pacemaker is routine. In many cases, the operation takes one to two hours, and patients may stay in the hospital several hours or several days.

Each patient is unique, and the surgery will differ from person to person. You should discuss the specifics of your case with your physician.

What happens before surgery?

Before the surgery, your doctor will tell you how to prepare for the operation. You may have to stop taking one or more of your medications beforehand. Usually, patients are asked not to drink or eat for several hours before the operation. A technician may take a blood sample. Some doctors will also ask patients to complete various forms.

What happens on the day of surgery?

You will be taken to an operating room where a nurse or clinician will shave and wash your upper chest. You may have an IV (*intravenous*) line placed in your arm and a blood pressure cuff around your arm. ECG (*electrocardiogram*) electrodes will be placed on various parts of your body.

Most patients stay awake for the procedure, and receive a shot of a *local anesthetic* to numb the area where the Pacemaker will be placed. If you are going to be given *general*

anesthetic, an anesthesiologist will give you medications to put you to sleep.

What happens during surgery?

After the skin of the shoulder or chest is cleaned and numbed with an anesthetic, the doctor makes a cut through the skin about one to two inches or about two to four centimeters long. The doctor then finds a vein and threads the lead directly into the heart, using a fluoroscope (a type of x-ray) to see where it will go. You should not feel the leads in your heart.

The doctor then makes a small "pocket" under the skin. The doctor fits the Pacemaker into the pocket and connects it to the leads. The Pacemaker is then tested to make sure it is working properly.

You may feel some pressure while the Pacemaker and leads are being inserted. If you begin to feel increased discomfort, let the doctor know immediately.

What happens after surgery?

You will be taken to a recovery room where nurses will look after you to make sure you are doing well. You may feel some soreness where the Pacemaker was implanted. You will be given pain medication if you need it.

Later on, the doctor or clinician will test your Pacemaker to make sure it is working properly.

Coming Home after Surgery

What will happen when I get home from the hospital?

For the first few days or weeks after your operation, you will need to recover. Follow your doctor's instructions carefully. The wound should gradually heal. You should feel better. At first, you may be aware of the Pacemaker but after a while you will not notice it.

After surgery, you should:

- Keep the wound clean and dry. If you notice that the wound is red, hot, swollen, more painful or starts to drain fluid, call your doctor immediately. Do not wait for a follow-up visit.
- Follow the instructions about bathing and changing the wound dressing.
- Use only gentle movements with the arm closest to the Pacemaker. Avoid stretching, lifting, and sudden, jerky movements. As you heal, gradually increase the use of your arm.
- Do not play with or move the Pacemaker under your skin.
- Keep your doctor appointments.
- Keep your Patient Identification Card with you at all times.
- Follow your doctor's instructions for returning to your normal activities.
- Follow your doctor's instructions on any

medications that have been prescribed.

How often do I need to see my doctor?

You will be asked to see your doctor regularly for routine checkups.

Immediately after your surgery, you will probably be asked to visit the doctor several times. These are very important visits, and they allow your physician to be sure your 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. Your doctor will also want to check the incision to see how it is healing. After that, your physician will want to see you for regular follow-up visits. He or she will advise you how often you should be evaluated because it varies by patient and condition.

What happens during a follow-up visit?

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 television remote control.

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 heart's rhythms since your last follow-up.

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

Be sure to tell your doctor or clinician about any problems you may be having with the Pacemaker, your heart or your health in general. It's also a good time to ask questions about your Pacemaker.

What is remote monitoring?

Some doctors ask patients to "send in" information instead of coming in for a follow-up visit.

Many doctors use remote monitoring along with visits to the clinic.

There are a number of different systems for remote monitoring. They are all fairly easy to use. Your doctor will discuss the remote monitoring options with you.

When can I get back to my old life?

Each person's recovery period is different, but eventually, you may be able to return to your normal life with very few changes.

Your wound should be completely healed before you return to your usual daily activities. Talk to your doctor about how soon you can return to work, drive your car, begin exercising, or go away on a trip.

Your doctor is your source of advice for resuming your normal activities.



Living with Your Pacemaker

What is a Patient Identification Card?

This card lets everyone know that you have a Pacemaker. It contains information on the type of Pacemaker you have and other important information. If you're ever in a medical emergency, this card will give emergency personnel critical data that could save your life. Keep it with you at all times.

Figure 5. An example of a typical St. Jude Medical Cardiac Patient Identification Card (North American patients only).

 ST. JUDE MEDICAL		Cardiac Pacemaker Patient Identification Card	
PATIENT:	MARY SMITH		
ICD	MODEL NUMBER	SERIAL NUMBER	IMPLANT DATE
	1111	222222	11/JUL/2009
RA-LEAD	3333	A444444	11/JUL/2009
RV	55555	B666666	11/JUL/2009
PHYSICIAN:			
JOHN JONES			
SMALLTOWN, USA 12345		PHONE: 222-222-2222	
 ST. JUDE MEDICAL			
Patient Records Department 800 777 2237 818 362 6822			
<p>Devices from different manufacturers vary in functional characteristics. If you have any questions regarding the function of these medical devices, call the physician on the reverse side of this card or Patient Records.</p> <p>Should you change your address or physician, please notify us immediately by telephone so that we can send you a new card.</p>			

What is the "Patient Notifier"?

"Patient Notifier" is a safety feature in some devices that lets you know that you or your device needs attention. Some devices "notify" you by a two-tone audible signal. The "notifier" or alert may go off for a number of different reasons, like a low battery or a fast heart rate.

Your doctor will tell you if your device has this feature and what you should do if you sense it. After your surgery, your doctor or clinician will test the notifier so you can see how it feels or sounds when it goes off.

The notifier is there to help you. When it goes off, you should follow your doctor's instructions. If you don't remember the instructions, call your doctor's office as soon as possible to let them know you just received the alert.

Is it safe to engage in sexual activity?

Other than a brief stay in the hospital and a short recovery period, receiving a Pacemaker typically does not have any adverse effect on a patient's sex life. It is important, though, to follow your doctor's advice as to when to resume any physical activity.

Will a Pacemaker limit the things I do?

One of the reasons for getting a Pacemaker is to help you lead a fuller life. At home, most people will have no restrictions on their activity. If you work with heavy electrical equipment that causes EMI, tell your doctor.

Precautions and Warnings

What is EMI?

EMI means *electromagnetic interference*.

Certain types of electrical or magnetic energy can interfere with your Pacemaker's operation. You should do your best to avoid some major causes of EMI, explained below.

What causes EMI?

EMI can be caused by:

- Electrical appliances in poor condition or not grounded correctly.
- Electrical equipment that produces a great deal of energy, like industrial generators.
- Metal detectors and security systems used in stores and airports.
- High-voltage transmission lines and equipment, arc or resistance welders, induction furnaces.
- Communication equipment, such as microwave transmitters, linear power amplifiers, or high-power amateur transmitters.
- Transcutaneous Electrical Nerve Stimulation (TENS) units, which are electrical nerve and muscle stimulators.
- Therapeutic radiation, such as cancer radiation therapy.

- Electrosurgical cautery, which can inhibit the operation of your device.
- Magnets, large heaters, and radio transmitters.
- Magnetic resonance imaging (MRI) scans, which can severely damage your device when you are in or near an MRI room. But MRI scanners may not be a problem if your device is an "MR Conditional System" (see "What about MRI?" (page 32)).

What about MRI?

An MRI (Magnetic Resonance Imaging) scanner is a large machine that can make images of the soft tissues inside your body. This tool has been very helpful in diagnosing many problems. But to create the MR image, the scanner must generate very strong magnetic forces that can be very dangerous to almost all metallic implanted devices, like your pacemaker. The magnetic fields can interfere with the tiny computer in your

pacemaker and can heat the tips of leads in your heart to dangerous levels.

However, some patients are implanted with a St. Jude Medical device called an “MR Conditional pacing system.” This system is a lead and pacemaker combination that has been specially designed to withstand the forces of most MRI scanners. If you have this MR Conditional pacing system implanted, then you can have an MRI scan under certain circumstances. Ask your doctor if you have this kind of pacemaker.

What electrical equipment is safe to use?

Most home appliances in good working order are safe to use. This includes microwave ovens, blenders, toasters, electric knives, televisions, electric blankets, stoves and garage door openers.

Office equipment and most medical equipment is also safe to use. The Pacemaker will work properly during chest and dental

x-rays, diagnostic ultrasound, CT scan, mammography, and fluoroscopy.

What precautions should I take at work?

If you work near large sources of EMI (page 31), you should discuss this with your doctor and employer. You may be able to limit your exposure to these sources.

Are there precautions I need to take at home?

It is safest to live in a home that has a properly grounded electrical system, so three-prong plugs fit right into the wall. Poor grounding can cause EMI.

Keep your tools and appliances in good running order. Don't use products with breaks in the power cords. If you're fixing your car, remember that your car's electrical system can be a source of EMI.

Some speakers contain large magnets which can interfere with the Pacemaker.

Electric razors and all handtools that vibrate and are held directly over the Pacemaker may affect its operation.

What should I do if I am near a source of EMI?

If you become light-headed or feel palpitations (rapid, irregular heartbeats), you should simply turn off the electrical equipment or walk away from it, and the implanted device should resume normal operation.

If you feel symptoms after being near an EMI source, contact your doctor.

If using problematic equipment is something that you cannot avoid, your doctor can tell you what to do. 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.

Will airport security interfere with my device?

Though many patients worry about airport security systems, there is really no need for concern. The best thing to do when you reach airport security is to walk through the metal detector at a normal pace. If the alarm sounds (it may or may not), it only means that the system has detected the metal in your device. Simply show your identification card. Security personnel may perform a search with a handheld wand.

What if I am going into a hospital or clinic?

Tell the hospital personnel that you have a Pacemaker before you undergo any medical procedure, such as electrosurgery, electrocautery, cardioversion, lithotripsy or radiation therapy, or a dental procedure or test.

Do not enter areas that have a "no pacer" symbol posted.



Talk to your doctor if you have to undergo the following medical procedures:

- Electrosurgery/Electrocautery
- Cardioversion
- Lithotripsy
- Diathermy
- MRI
- Radiation therapy

Will a cellular phone interfere with my Pacemaker?

Cellular phones, which send electromagnetic signals, can interfere with proper device operation. However, simple precautions such

as not carrying the phone in a breast pocket over the Pacemaker and holding it to the ear that is farthest away from the Pacemaker will 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 Pacemaker?

There is no indication that compact multimedia players such as iPod™ music players¹ or MP3 players interfere with the normal function of a St. Jude Medical™ Pacemaker.

What about security systems?

Security systems, like the ones used at entrances, exits, or checkout counters are also sources of EMI. When you enter or leave a place with a security system, walk through the

¹ iPod is a trademark of Apple Inc., registered in the US and other countries.

entrance or exit at a normal pace. Do not linger in these areas.

Learning to Live with a Pacemaker

I am feeling worried or sad. Is there anything I can do?

Health is not just physical. Many patients experience stressful feelings after a device has been implanted. There are many ways to cope:

- Talk to other people. It will help you work through your feelings. Talk to your doctor, a nurse, a counselor, a friend or family member, or a member of the clergy.
- Talk to your doctor about joining a support group. Sharing experiences with other Pacemaker patients lets you know that you are not alone.

- Exercise regularly. It's a great way to reduce stress, build strength and gain confidence. Remember to ask your doctor before starting an exercise program. There is more about exercise later in this guide.



- Learn more about relaxation. Too much stress can wear you down and increase your chance of getting other illnesses. It also disturbs your sleep and makes you cranky.
- One good way to relax is to sit quietly with your eyes closed for 20 to 30 minutes twice a day. A short nap each day or a slow walk every morning can also be calming.

- Take care of yourself. Avoid alcohol and caffeine. And quit smoking. These habits can make anxiety and depression worse.

My spouse/family member is the patient. How can I help?

If a family member or friend is the patient, it is natural for you to have the same fears and worries. There are several things that can help both of you cope with their condition. For example, listen when they want to talk. Your loved one needs reassurance that they have your support.

Medications

Will I still need to take medication after I have a Pacemaker?

This is a question for your doctor. Usually, having a Pacemaker does not replace medication.

Make sure your doctor knows about all of the medications you are currently taking. Tell your doctor whenever another doctor prescribes a new medication.

WARNING

Do not stop taking your drug(s) without the advice of your doctor.

Food and Nutrition

I already have heart disease. Will changing my diet benefit me?



It is never too late to improve your diet. Experts recommend a diet high in fiber and low in fat, cholesterol and sodium (salt).

High-fat, high-cholesterol foods (such as whole milk dairy products, red meats and junk foods) contribute to hardening of the arteries—a major cause of heart attacks and strokes. High-fiber foods are rich in vitamins and minerals and make you feel full and satisfied for fewer calories.

Besides diet, what affects heart health?

Many factors contribute to heart disease. Some things you can't change, like your sex, race, age, high blood pressure and family history. You can change other things that affect your heart, like smoking, a poor diet and lack of exercise. If you have high blood pressure, have it checked regularly and follow your doctor's instructions to keep it under control.

What about sports and recreation?

In most cases, your Pacemaker will not limit your fun. However, avoid rough contact sports that might damage your Pacemaker—like

football, soccer or rugby. Strenuous or repetitive upper-body exercise, like weight-lifting or baseball, can in some cases affect your Pacemaker or leads.

Before you begin any vigorous exercise or activity, talk to your doctor.



What is cardiac rehabilitation?

It is an exercise and education program to help you regain your strength and improve your heart health. A typical program consists of regular exercise monitored by medical professionals. Walking and bicycling are the most common exercises. You will also attend

classes to learn more about your heart, the reasons for your heart disease, and how to live a healthier life.

Ask your doctor if this kind of program would be good for you. They will develop one specifically for you.

Other Questions

If you have any other questions or would like more information about your Pacemaker, you can reach Technical Services by using the phone numbers below.

Outside North America (Sweden):

By telephone:

+46 8 474 4147

or by fax during regular business hours:

+46 8 760 5126

In North America (USA):

By telephone:

+1 818 364 1506

+1 800 722 3774

(toll free in North America)

or by fax:

+1 818 833 4960

+1 800 756 7223

(toll free in North America)

Glossary

Anesthetic

A substance that produces numbness or sleep.

Arrhythmia

An abnormal rhythm of the heart.

Atrial

Relating to the atrium.

Atrioventricular (AV) Node

The small mass of special tissue that delays the energy pulse traveling from the SA Node to the lower chambers (ventricles) of the heart.

Atrium

One of the two upper chambers of the heart. These chambers receive blood from the body and pump it to the ventricles, the lower chambers of the heart. (Plural = Atria)

Bradycardia

A slow heart rate.

Cardioversion

The use of electric shock to stop rapid heartbeats, usually ventricular tachycardia or atrial fibrillation.

Chamber

One of the four areas in the heart that fills with blood before contracting during the heartbeat. The four chambers are: right atrium, left atrium, right ventricle, and left ventricle.

Congestive Heart Failure

The failure of the heart to pump enough blood to the rest of body, resulting in congestion of blood in the lungs and tissues.

Contraction

A squeezing of the heart muscle that forces blood out of the heart. This contraction is the heartbeat.

Defibrillation

The use of electric shock to stop rapid heartbeats, usually tachycardia or fibrillation. Defibrillators use paddles on the outside of the chest or internal electrodes placed directly on the heart.

Dual-Chamber Pacemaker

A Pacemaker with two leads, usually connected to the right atrium and right ventricle.

Electrocardiogram

Often called an EKG or ECG, it is a “picture” showing the electrical activity of the heart.

Electromagnetic Interference

Also known as EMI, this is magnetic or electrical interference from machines or devices which can interrupt the normal operation of a Pacemaker.

Electrophysiologist

A doctor who specializes in diseases of the

electrical system of the heart.

Embolism

Obstruction of a blood vessel by a blood clot.

EMI

See *Electromagnetic Interference*.

Fibrillation

An arrhythmia in which the heart quivers rapidly. Atrial fibrillation occurs in the atrium and is usually not life-threatening.

Ventricular fibrillation occurs in the ventricles and can be fatal.

General Anesthetic

A medication or group of medications that will make the patient unconscious during surgery.

Intravenous (IV)

Inside a vein.

Lead

A special wire connected to the Pacemaker

and placed in or on the heart.

Local Anesthetic

A medication used in surgery that numbs only one area of the body while the patient stays awake.

Pacemaker

An implanted device about the size of a pocket watch. It provides electrical support. The device sends a tiny electrical pulse down a wire, called a lead, into your heart, which stimulates the heart to beat.

Programmer

A special computer designed to communicate with or “program” an implanted Pacemaker.

Pulse

A short burst of electricity.

Rate-Modulated

A Pacemaker that can sense a person’s

activity and change the heart rate accordingly.

Remote Monitoring

Using a device or machine to transmit information about your Pacemaker.

Rhythm

A pattern of electrical signals of the heart (regular beating of your heart).

Single-Chamber Pacemaker

A pacemaker attached to a single lead.

Sinoatrial (SA) Node

The small mass of special tissue that generates a heartbeat. It is located in the upper right chamber of the heart.

Tachycardia

A fast heart rate.

Ventricles

The two lower chambers of the heart. These chambers pump the blood out of the heart

into the body.

Ventricular

Relating to the ventricle.

Notes

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