Boston Scientific

Pacemaker Therapy Patient Handbook





Your pacemaker system information

Have your doctor or nurse complete these forms before you go home from the hospital.

Pacemaker Model Number: _____

Pacemaker Serial Number: _____

Implant Date: _____

Lead Model/Serial Numbers: _____

_____

_____

_____

Your medical contact information

Electrophysiologist Name/Phone Number:

_____

_____

Cardiologist Name/Phone Number:

_____

_____

Hospital Name/Address/Phone Number:

_____

_____

Medications (list): _____

_____

_____

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Introduction

Your doctor has recommended a pacemaker system to treat your slow heart rhythm. As a person with a slow heart rhythm, you may experience symptoms that can affect your quality of life. A pacemaker is designed to monitor and treat heart rhythm problems, greatly reducing the risks associated with them.

This handbook will tell you how a pacemaker system treats heart rhythms that are too slow. It will discuss activities you can begin and those you should avoid after your surgery. It will talk about some of the changes that may occur in your life. It will also answer many questions patients typically have. If you have questions about what you read in this handbook, ask your doctor or nurse. They are your best resource for information.

The glossary is located at the front of the handbook. It defines many of the words you will see in the upcoming pages, as well as those you may hear from your doctors and nurses.

When is this device used?

Your doctor has decided that you should receive a pacemaker system to treat and monitor your slow heart rhythm. If you have any questions about when this device is used, ask your doctor.

When is this device not used?

Patients who have additional medical conditions that may not allow the pacemaker to function appropriately should not receive a device. If you have any questions about when this device is not used, ask your doctor.

How reliable is this device?

It is Boston Scientific's intent to provide implantable devices of high quality and reliability. However, these devices may exhibit malfunctions that may result in lost or compromised ability to deliver therapy. Refer to Boston Scientific's *CRM Product Performance Report* on www.bostonscientific.com/ppr for more information about device performance, including the types and rates of malfunctions that these devices have experienced historically. While historical data may not be predictive of future device performance, such data can provide important context for understanding the overall reliability of these types of products. Talk with your doctor about this product performance data, and the risks and benefits associated with the implantation of this system.

Glossary

Adaptive rate

The ability of a device to increase or decrease its pacing rate in response to bodily needs, activity, or exercise.

Asynchrony

A condition in which the heart fails to maintain a normal timing sequence between atrial and ventricular contractions.

Atrioventricular (AV) node

A cluster of cells located in the wall between the right and left atrium, just above the ventricles. This part of the heart's electrical pathway helps carry signals from the atria to the ventricles.

Atrioventricular (AV) synchrony

The normal timing sequence for an atrial contraction followed, after a fraction of a second, by a ventricular contraction.

Atrium (plural: atria)

One of the two upper chambers of the heart, specifically the right atrium and left atrium. The atria collect blood as it comes into the heart and pump blood into the lower chambers (ventricles).

Bradycardia

An abnormally slow heartbeat, typically fewer than 60 beats per minute.

Catheter

A thin, flexible tube or wire inserted into the body for a variety of purposes. Catheters are inserted into the heart during an electrophysiology (EP) test to monitor your heart's electrical activity. Hollow catheters are also used to carry a lead through a blood vessel. See also *Electrophysiology (EP) test or study*.

Communicator

See *LATITUDE Communicator*.

Device

See *Pulse generator*.

ECG/EKG (electrocardiogram)

A graphic representation of your heart's electrical signals. The graph shows how electrical signals travel through your heart. Your doctor can tell what kind of rhythm you have by looking at the pattern of your heartbeat.

Electromagnetic field

Invisible lines of force that are the result of electrical fields (produced by voltage) and magnetic fields (produced by current flow). Electromagnetic fields decrease in strength the farther they are from their source.

Electromagnetic interference (EMI)

Interference that occurs when an electromagnetic field interacts with an implanted device. See also *Electromagnetic field*.

Electrophysiology (EP) test or study

A test in which catheters (thin, flexible tubes or wires) are inserted into your heart to identify and measure the type of electrical signals in your heart. The test results can help your doctor identify the origins of your abnormal heart rhythms, determine how well medications work, and decide what treatment is best for your condition.

Heart attack

See *Myocardial infarction (MI)*.

Heart block

A condition in which the electrical signals of your heart's natural pacemaker (SA node) are delayed or do not reach the ventricles.

Heart rhythm

A series of heartbeats. You may hear your doctor refer to your rhythm as being normal or irregular. A normal heart rate typically ranges from 60 to 100 beats per minute at rest.

Interrogation

The process whereby a computerized device (programmer or LATITUDE Communicator) uses telemetry communication signals to gather identification and status information from your device. Your doctor uses this information to evaluate how your device is performing and check for any arrhythmia episodes you may have had.

LATITUDE Communicator

An in-home monitoring system that communicates with your device. The Communicator can gather and send device data to the LATITUDE Patient Management System, which your physician can then view via the Internet. Your device may or may not be configured to use the LATITUDE Patient Management System. See also *LATITUDE Patient Management System*.

LATITUDE Patient Management System

A remote monitoring system that collects important data from your device. This patient information can be viewed via the Internet, only by members of your health care support team. Your device may or may not be configured to use the LATITUDE Patient Management System. See also *LATITUDE Communicator*.

Lead (pronounced "leed")

An insulated wire that is implanted in the heart and connected to the device. The lead senses your heartbeat and delivers pacing pulses from the device to the heart. The leads are usually passed into your heart through a vein.

Myocardial infarction (MI)

Also called a heart attack. A myocardial infarction occurs when an artery that supplies blood to the heart becomes blocked. As a result,

blood does not reach some parts of the heart, and some of the heart tissue dies. Symptoms of a myocardial infarction may include shortness of breath, nausea, fatigue, and/or pain in the chest, arm, or neck.

Pacemaker system

A pulse generator (also called a device) and leads. A pacemaker system is implanted to monitor your heart rhythm and treat dangerously slow rhythms.

Pectoral

The area above the breast and below the collarbone. This is a common area for a device implant.

Programmer

Microcomputer-based equipment that is used to communicate with the device. The programmer is used during testing and follow-up exams to gather and display information from the device. The doctor or technician also uses the programmer to adjust the device so that it senses and treats your slow heart rate.

Pulse generator

Also called a device. The pulse generator is the part of the pacemaker system that contains the electronics and battery; it is implanted under the skin in the pectoral (or, in some cases, abdominal) area. See also *Pectoral*.

Radio frequency (RF) wireless communication

Technology that allows the device to exchange information with a programmer or LATITUDE Communicator by communicating over radio signals.

Sinoatrial (SA) node

The heart's natural pacemaker. The SA node is a small group of specialized cells in the upper right chamber of the heart (right atrium) that normally generates an electrical signal. This signal runs through the heart and causes the heart to beat.

Telemetry communication

Technology that allows a device to exchange information with a programmer or LATITUDE Communicator by using radio frequency (RF) telemetry communication.

Ventricle

One of the two lower chambers of the heart. The right ventricle pumps blood to the lungs, and the left ventricle pumps oxygen-carrying blood from the lungs to the rest of the body.

Your heart's natural pacemaker

Your heart works as both a mechanical pump and an electrical organ. It is able to beat because it produces electrical signals. These signals travel through the electrical pathways of your heart (Figure 1), causing the muscle contraction that pumps blood throughout your body.

Normally these signals come from a small area in your heart called the sinoatrial (SA) node. This area is located in the upper right chamber, or right atrium. When the SA node signals reach the two upper chambers of the heart (the atria), they contract at the same time. The atrial contraction fills the two lower chambers (the ventricles) with blood (Figure 2). As the electrical signal travels through the ventricles, it causes them to contract, which pumps blood out to your body. The contraction of the heart muscle (ventricles) is what you feel as a heartbeat. After a brief rest, the cycle begins again.

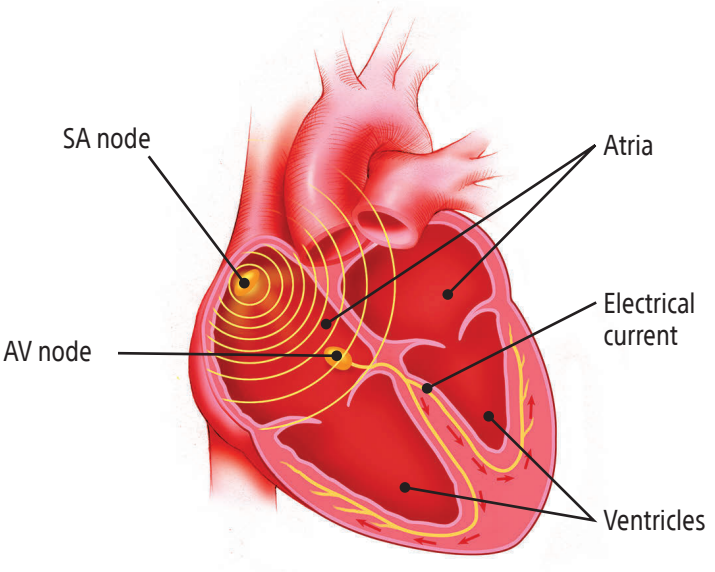


Figure 1. The heart and its electrical pathways.

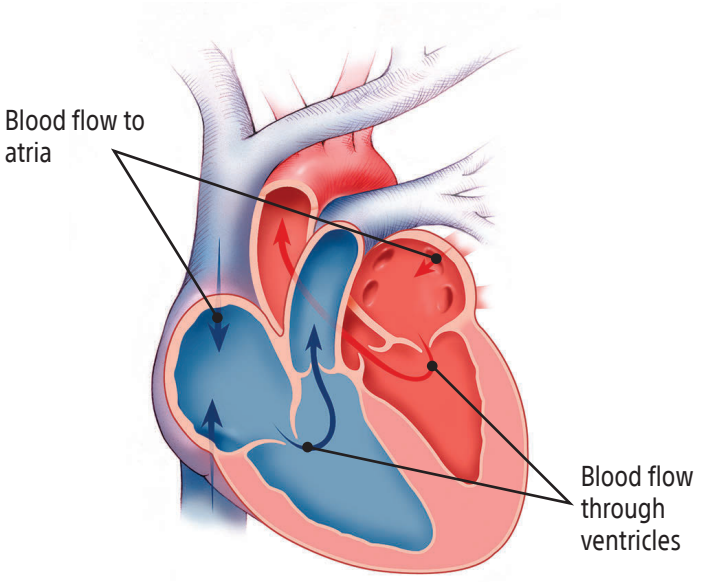


Figure 2. The heart and its blood flow.

Bradycardia

Sometimes the heart beats too slowly. This can be caused by the SA node not working properly or by a condition called heart block (Figure 3). Heart block exists when there is a problem with the electrical pathway between the atria and the ventricles. The natural pacemaker signals sent out by the SA node could be delayed or may not reach the ventricles.

During bradycardia, the chambers of the heart do not contract often enough to supply the proper amount of blood to your body. If you have bradycardia you may feel tired or dizzy, or you may faint.

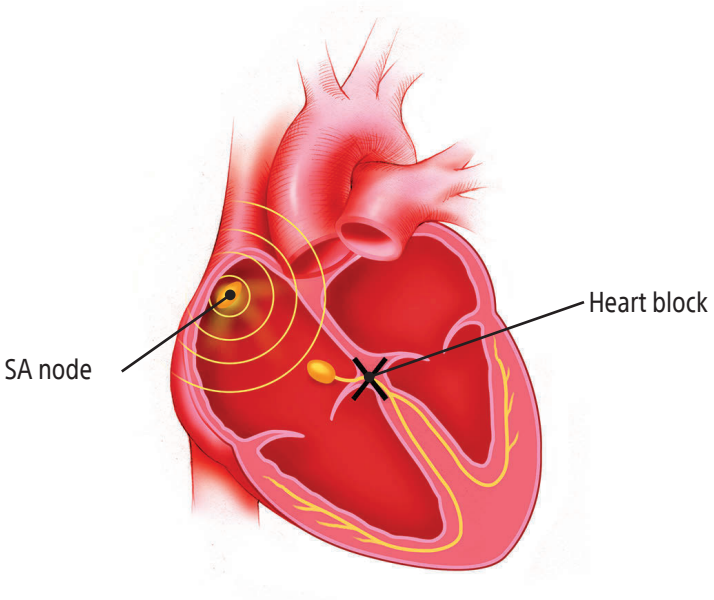


Figure 3. An example of heart block.

Your pacemaker system

Your pacemaker system is designed to monitor and treat your heart rhythm. The system consists of a pulse generator (also called a device), which is typically implanted in your chest, and one or more leads, which are implanted in your heart and connected to the device.

The device

The device contains a small computer. It runs on a battery that is safely sealed within its case. The device continuously monitors your heart rhythm and delivers electrical energy (as programmed by your physician) to pace your heart during a slow rhythm.

As the device monitors your heart rhythm, it can also store information about your heart. Your doctor can review this information using a special computer called a programmer. The programmer communicates with the device from outside your body through a wand that is placed over your skin. With the programmer, your doctor can better evaluate the programmed therapy for your heart rhythm and adjust the settings if necessary.

Types of pacemakers

There are two different types of pacemakers: single-chamber and dual-chamber. Both of these pacemakers continuously monitor your heart rate and send out pacing signals when necessary. It is important to discuss with your doctor which kind of pacemaker is right for you.

Single-chamber pacemakers

A single-chamber pacemaker has one lead to monitor signals from and deliver pacing pulses to one chamber of your heart (either the right atrium or right ventricle). This type of pacemaker is often selected for a person whose SA node sends out signals too slowly.

Dual-chamber pacemakers

A dual-chamber pacemaker has two leads. One lead is placed in the right atrium, and the other lead is placed in the right ventricle. Because there are leads in two chambers, the pacemaker can monitor signals from and deliver pacing impulses to either or both of these heart chambers.

A dual-chamber pacemaker may be selected for many different reasons. For some people, the SA node's signals are too slow and the electrical pathway to the ventricles is partly or completely blocked. A dual-chamber pacemaker can help treat both problems. For other people, the timing of the atrial and ventricular contractions is uncoordinated (asynchronous). A dual-chamber pacemaker can restore a normal timing sequence (also called AV synchrony).

The leads

A lead is an insulated wire implanted in your heart and connected to the device. The lead carries the heart signal to the device. It then carries energy from the device back to the heart to coordinate your heart rhythm.

Implanting your pacemaker system

A pacemaker system is implanted during a surgical procedure. To keep you as comfortable as possible, you will be sedated for this surgery. During the procedure, your doctor will insert the lead into a vein, usually through a small incision near your collarbone. The doctor will then pass the lead through the vein into your heart (in either the right atrium or the right ventricle), where the tip of the lead will rest directly against your heart's inner wall (Figure 4).

If your doctor decides your heart condition requires a dual-chamber system, an additional lead will be implanted. One lead will be positioned in the atrial chamber of your heart and the other will be positioned in the ventricular chamber (Figure 5).

After the leads are positioned, they will be tested to make sure they clearly sense your heart signal and can adequately pace your heart. After this testing, the device will be connected to the leads and placed in position (usually below the collarbone, just beneath the skin).

Your doctor will then test your pacemaker system to make sure it can appropriately monitor and treat your heart rhythm.

After your doctor has finished testing your system, the incision will be closed. You may experience some discomfort from the incision as you recover from the surgery. You should be able to return to normal activities soon after the procedure.

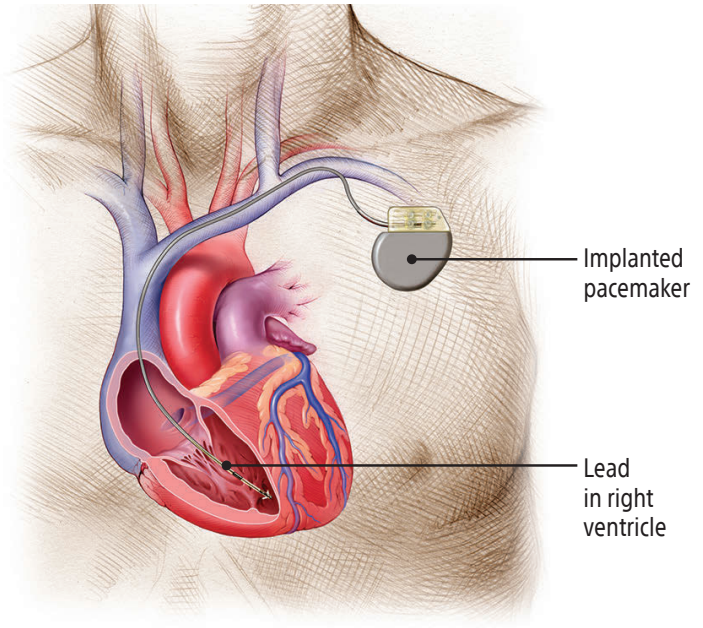


Figure 4. An implanted single-chamber pacemaker system.

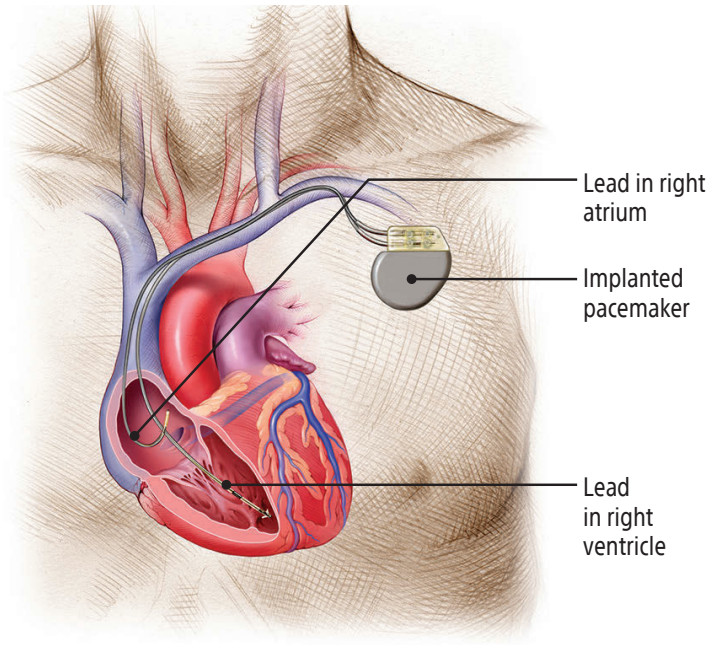


Figure 5. An implanted dual-chamber pacemaker system.

Implant risks

As with any surgical procedure, it is important to understand that, while complications do not happen very often, there are risks associated with the implantation of a device or lead. You should talk with your doctor about these risks, including those listed below.

Some risks encountered during the implant procedure include, but are not limited to, the following:

- Bleeding
- Formation of a blood clot
- Damage to adjacent structures (tendons, muscles, nerves)
- Puncture of a lung or vein
- Damage to the heart (perforation or tissue damage)
- Dangerous arrhythmias
- Heart attack
- Stroke
- Death

Some of the risks encountered after the system is implanted may include, but are not limited to, the following:

- You may develop an infection.
- You may experience erosion of the skin near your device.
- The device may move from the original implant site.
- The lead(s) may move out of place in the heart.

- The electrodes on the lead or the pacing pulses may cause an irritation or damaging effect on the surrounding tissues, including heart tissue and nerves.
- You may have difficulty coping with having an implanted device.
- The device might be prevented from pacing due to electromagnetic interference (see "Important safety information" on page 24).
- You may receive pacing therapy when it is not needed (unnecessary therapy).
- The device might not be able to detect or appropriately treat your heart rhythms.
- The device may exhibit malfunctions that may result in lost or compromised ability to deliver therapy. See "How reliable is this device?" on page 2.

Be sure to talk with your doctor so that you thoroughly understand all of the risks and benefits associated with the implantation of this system.

Report any serious incident that occurs in relation to your device to Boston Scientific and to the relevant local regulatory authority for medical devices in your country.

After your implant

As you recover from your implant surgery, you will find that your pacemaker system may allow you to return to an active lifestyle. It is important that you become actively involved in your recovery by following your doctor's instructions, including:

- Report any redness, swelling, or drainage from your incisions.
- Avoid lifting heavy objects until instructed by your doctor.
- Walk, exercise, and bathe according to your doctor's instructions.
- Do not wear tight clothing that could irritate the skin over your device.
- Contact your doctor if you develop a fever that does not go away in two or three days.
- Ask your doctor any questions you may have about your pacemaker system, heart rhythm, or medication.
- Avoid rubbing your device or the surrounding chest area.
- If directed by your doctor, limit arm movements that could affect your lead system.
- Avoid rough contact that could result in blows to your implant site.
- Tell your other doctors, dentists, and emergency personnel that you have a pacemaker system, and show them your Implant Card.

- Contact your doctor if you notice anything unusual or unexpected, such as new symptoms, or symptoms like the ones you experienced before you received your device.

Medications

Your pacemaker system is designed to help treat your heart condition. However, you may need to continue taking certain medications as well. It is important that you follow your doctor's instructions regarding any medications.

Activities and exercise

Your doctor will help you decide what level of activity is best for you. He or she can help answer your questions about lifestyle changes, travel, exercise, work, hobbies, and resuming sexual intimacy.

Your pacemaker system information

Have your doctor or nurse complete the "Your pacemaker system information" form at the front of this handbook before you go home from the hospital.

Living with your pacemaker system

It is important to follow your doctor's instructions and keep your scheduled follow-up appointments. You should also do the following:

- Ask your doctor if you have any questions about or notice anything unusual with your device.
- Take the medications prescribed for you as instructed by your doctor.
- Carry your medications list with you at all times.
- Tell your family doctor, dentist, and emergency personnel that you have a pacemaker.

Special considerations

Your doctor might ask you to avoid activities where the risk of unconsciousness could endanger you or others. These activities might include driving, swimming or boating alone, or climbing a ladder.

Driving

Driving laws and symptoms caused by your heart rhythm are often the deciding factors in whether you will be allowed to drive. Your doctor will advise you on what is best for your safety and the safety of others.

When to call your doctor

Your doctor will provide guidelines for when you should contact him or her. In general, phone your doctor if you:

- Have a heart rate that drops below the minimum rate set for your pacemaker.
- Have symptoms of an abnormal heart rhythm and have been instructed to call.
- Notice any swelling, redness, or drainage from your incisions.
- Develop a fever that does not go away in two or three days.
- Have questions about your pacemaker, heart rhythm, or medications.
- Plan to travel or move away. Work with your doctor to develop a follow-up plan while you are away.
- Notice anything unusual or unexpected, such as new symptoms or symptoms like the ones you had before you received your device.

Remember that your pacemaker is designed to monitor and treat your slow heart rate. It can be a great source of reassurance for you and your friends and family.

Follow-up visits

Your doctor will schedule regular follow-up visits. It is important that you attend these visits, even if you are feeling well. Your pacemaker has many programmable features; follow-up visits will help your doctor program your pacemaker to best meet your individual needs.

During your visit, the doctor or nurse will use a programmer to check your device. The programmer is a special external computer that can communicate with your device in two ways:

1. By using radio frequency (RF) telemetry communication, if you have an RF-enabled device.

2. By using wanded telemetry communication. In this case, the doctor or nurse will place a wand over your skin near your device.

A typical follow-up visit takes about 20 minutes. During your visit, your doctor or nurse will use the programmer to interrogate, or check, your device. They will review the device's memory to evaluate its performance since your last visit. If necessary, they will adjust your device's programmed settings. They will also check the battery to see how much energy is left.

Remote follow-up sessions

Your physician may want you to use the LATITUDE Patient Management System. When using the LATITUDE Patient Management System, you will receive a home monitoring unit called a Communicator. The Communicator is used to interrogate your device on a regular schedule that is set by your physician. The Communicator then sends the data gathered from your device to the LATITUDE Patient Management secure database. Your doctor can then access this database using an Internet-enabled personal computer.

While use of the Communicator does not eliminate the need for in-office visits that may be scheduled by your physician, it can minimize the number of them. The Communicator

cannot reprogram or change any functions of your device. Your physician can only do this using a programmer during an office visit.

What you should know about your pacemaker's battery

A battery, safely sealed inside your device, provides the energy needed to monitor your heart rhythm and pace your heart. Just like any other type of battery, the battery in your device will be used up over time. Since the battery is permanently sealed within your device, it cannot be replaced when its energy is depleted. Instead, your entire device will need to be replaced (see "Replacing your system" on page 22). How long your pacemaker's battery lasts depends upon the settings your doctor programs and how much therapy you receive.

How will you know if your pacemaker's battery is running down?

Device batteries have very predictable behavior over time. Your device will regularly check its own battery. At every follow-up visit, the doctor or nurse will also check to see how much energy is remaining in the battery. When the battery's energy level decreases to a certain point, your device will need to be replaced.

Replacing your system

Eventually, the energy in your device's battery will decrease to a point where your device will need to be replaced (see "What you should know about your pacemaker's battery" on

page 22). Your doctor will monitor your device's battery levels and determine when to replace your device.

To replace your device, your doctor will surgically open the pocket of skin where your device is located. He or she will disconnect your old device from your leads and then check to make sure your leads work properly with your new device.

In rare instances, your leads may not work properly with your new device, and your doctor may need to replace the leads. Your doctor will determine if your leads should be replaced.

Should a lead need to be replaced, your doctor will insert a new lead into a vein, similar to how the original lead was implanted. See "Implanting your pacemaker system" on page 13.

Your doctor will then connect your leads to the new device. Finally, he or she will test your new system to make sure it is working properly.

After the testing is complete, the pocket of skin will be closed. You may experience some discomfort from the incision as you recover from the surgery. You should be able to return to normal activities soon after the procedure.

Risks

Risks encountered during a device and/or lead replacement procedure are similar to the risks of the initial implant, such as infection, tissue damage, and bleeding. See "Implant risks" on page 15.

Be sure to talk with your doctor about the potential risks when making decisions about replacing your system.

Important safety information

Your device has built-in features that protect it from interference produced by most electrical equipment. Most of the things you handle or work around on a daily basis are not going to affect your device. However, your device is sensitive to strong electromagnetic interference (EMI) and can be affected by certain sources of electric or magnetic fields.

If your employment requires you to be close to large industrial generators or sources of radar you may need special consideration before returning to work. If your work takes place in such an environment, please talk with your physician.

Operating household appliances and tools

Use the following guidelines for safe interaction with many common tools, appliances, and activities.

Items that are safe under normal use:

- Air purifiers
- Blenders
- CD/DVD Players
- Clothes washing machines and dryers
- Electric blankets
- Electric can openers
- Electric invisible fences
- Electric toothbrushes

- Fax/copy machines
- Hair dryers
- Heating pads
- Hot tubs/whirlpool baths

  NOTE: *Consult with your doctor before using a hot tub. Your medical condition may not permit this activity; however, it will not harm your device.*
- Laser tag games
- Microwave ovens
- Ovens (electric, convection, or gas)
- Pagers
- Patient alert devices
- Personal computers
- Personal digital assistants (PDAs)

  NOTE: *PDAs that also function as cell phones should be kept at least 6 inches (15 cm) away from your device. See "Cellular phones" on page 30.*
- Portable space heaters
- Radios (AM and FM)
- Remote controls (tv, garage door, stereo, camera/video equipment)
- Stoves (electric or gas)
- Tanning beds
- Televisions
- TV or radio towers (safe outside of restricted areas)
- Vacuum cleaners

- VCRs
- Video games

Warnings and precautions

If you use any of the following items, it is important that you keep them the recommended distance away from your device to avoid interaction.

Items that should not be placed directly over your device, but are otherwise safe to use:

- Cordless (household) telephones
- Electric razors
- Hand-held massagers
- Portable MP3 and multimedia players (such as an iPod) that do not also function as a cellular phone (see "Cellular phones" on page 30)

  NOTE: *While portable MP3 players themselves should not interfere with your device, the headphones or earbuds should be stored at least 6 inches (15 cm) away from your device, and you should avoid draping the headphones around your neck.*

Items that should remain at least 6 inches (15 cm) away from your device:

- Cellular phones including PDAs and portable MP3 players with integrated cellular phones

  NOTE: *For more information on cellular phones, see "Cellular phones" on page 30.*

iPod is a trademark of Apple Inc.

- Devices transmitting *Bluetooth*® or Wi-Fi signals (cellular phones, wireless Internet routers, etc.)
- Headphones and earbuds

  NOTE: *It is safe to use headphones and earbuds, but you should refrain from draping them around your neck and from storing them in a breast or other shirt pocket that places them within 6 inches (15 cm) of your device.*
- Magnetic wands used in the game of Bingo
- Purses, attaché bags, backpacks, bracelets, and electronic device cases/holders with magnetic closures/snaps; respiratory masks (e.g., CPAP masks) with magnetic straps; and clothing with built-in magnets

Items that should remain at least 12 inches (30 cm) away from your device:

- Battery powered cordless power tools
- Chain saws
- Corded drills and power tools
- Home power generators
- Lawn mowers
- Leaf blowers
- Remote controls with antennas
- Shop tools (drills, table saws, etc.)
- Slot machines

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- Snow blowers
- Stereo speakers

Items that should remain at least 24 inches (60 cm) away from your device:

- Arc welders
- CB and police radio antennas
- Running motors and alternators, especially those found in vehicles

  NOTE: *Avoid leaning over running motors and alternators of a running vehicle. Alternators create large magnetic fields that can affect your device. However, the distance required to drive or ride in a vehicle is safe.*

Items that should not be used:

- Body fat measuring scales
- Jack hammers
- Magnetic mattresses and chairs
- Stun guns

Call your doctor if you have questions about the EMI safety of a particular appliance, tool, or activity.

Theft detection and security systems

Electronic antitheft systems (including tag deactivation) and security gates or tag readers that include radio frequency identification (RFID) equipment (often found in store and library doorways, at checkout counters, and in point-of-entry access control systems) should not cause you any worry if you follow these guidelines:

- Walk through theft detection and security systems at a normal pace.
- Do not lean against or linger near these systems.
- Do not lean against checkout counter-mounted or handheld tag deactivation systems.
- Avoid lingering near entrance and exit doorways, as some theft detection systems may be hidden in the walls or the floor in these areas.
- If you are near an electronic antitheft, security, or entry control system and suspect interaction (experience symptoms) with your device from one of these systems, promptly move away from equipment nearby and inform your doctor.
- Most home security systems are unlikely to affect the proper function of your implanted system.
- Your Boston Scientific implantable device is unlikely to set off the alarm from an electronic antitheft or security system.

Airport security

Your device contains metal parts that may set off airport security metal detector alarms. The security archway will not harm your device. Tell security personnel that you have an implanted device, and show them your Implant Card.

Airport security wands could temporarily affect your device. If possible, ask to be hand-searched instead of being searched with a handheld wand. If a wand must be used, inform the security personnel that you have an implanted device. Tell the

security personnel not to hold the wand over your device and to perform the search quickly.

Call your doctor if you have questions about airport security.

Cellular phones

Keep your cellular phone at least 6 inches (15 cm) away from your pacemaker. Your cellular phone is a source of EMI and could affect your device's operation. This interaction is temporary, and moving the phone away from the device will return it to proper function. To reduce the chance of interaction, follow these precautions:

- Maintain a distance of at least 6 inches (15 cm) between the cellular phone and your device. If the phone transmits more than 3 watts, increase the distance to 12 inches (30 cm).
- Hold the cellular phone to your ear on the opposite side of your body from your device.
- Do not carry a cellular phone in a breast pocket or on a belt if that places the phone within 6 inches (15 cm) of your device.

These precautions apply only to cellular phones, not to household cordless phones. However, you should avoid placing your household cordless phone receiver directly over your device.

Magnetic resonance imaging (MRI) safety information

This is a diagnostic test that uses a strong electromagnetic field. Some pacemaker systems have been engineered to allow the patient to undergo MRI scans under specific conditions. These are called MR conditional pacing systems. Even if you have an MR conditional device, you may feel a warm sensation, slight movement, or vibration from the device during an MRI scan. It is unlikely, but the heating and / or vibration could cause you discomfort. If you feel discomfort, tell your MRI technician.

Talk to your physician about the capabilities of your device and leads. If your system is not one of those eligible to be scanned, or if the required conditions are not met, MRI scans can severely damage your pacemaker system or injure you and should not be performed. Your physician must always confirm that both you and your pacing system are eligible and ready for an MRI scan in order for you to undergo this procedure.

Hospitals / healthcare centers keep MRI equipment in rooms marked with signs that indicate magnets are inside. Do not go inside these rooms unless your physician has confirmed that your pacing system is eligible and you meet the requirements for an MRI scan.

Dental and medical procedures

Some medical procedures could damage or otherwise affect your device. Be sure to always tell your dentist and physicians that you have an implanted device so that they can take

the necessary precautions. Be especially careful with the following procedures:

- **Diathermy:** This uses an electrical field to apply heat to tissues in the body and could damage your device or injure you. Diathermy should not be performed.
- **Electrocautery:** This is used during surgical procedures to stop vessels from bleeding. If electrocautery must be used, talk with your heart doctor and the doctor performing the medical procedure.
- **Electrolysis and Thermolysis:** These are dermatology or hair removal procedures that pass electrical current into the skin. Talk with your heart doctor before having any electrolysis or thermolysis treatment.
- **External defibrillation:** This is a procedure, typically used in medical emergencies, that uses external equipment to deliver an electrical shock to your heart to restore a rapid and irregular heart rate to a normal rhythm. External defibrillation can affect your device, but can still be performed if necessary. If you receive external defibrillation, be sure to contact your physician as soon as possible following the emergency to verify that your device is functioning properly.
- **Lithotripsy:** This is a medical procedure that is used to break up stones in the urinary tract (e.g., kidney stones). Lithotripsy can damage your device if certain precautions are not taken. Talk with your heart doctor as well as the doctor performing the procedure about what can be done to protect your device.

- **Therapeutic radiation treatment for cancer:** This procedure can affect your device and will require special precautions. If you should need radiation treatment, talk with your heart doctor as well as the doctor performing the medical procedure.
- **Transcutaneous Electrical Nerve Stimulation (TENS) unit:** This is a device prescribed by physicians or chiropractors for control of chronic pain. A TENS unit can affect your device and will require special precautions. If you must use a TENS unit, talk with your heart doctor.

Most medical and dental procedures will not affect your device. Some examples include:

- Dental drills and cleaning equipment
- Diagnostic X-rays
- Diagnostic ultrasound procedures
- Mammograms

  NOTE: *Mammograms will not interfere with your device. However, your device could be damaged if it gets compressed in the mammogram machine. Make sure the doctor or technician knows that you have an implanted device.*
- EKG machines
- CT scans

If you need to undergo any surgical procedures, tell your dentist and/or doctor that you have a pacemaker system. They can contact the physician who monitors your device to find the best way to provide treatment.

Call your doctor if you have questions about a specific appliance, tool, medical procedure, or piece of equipment.

Summary

It is natural for you to feel anxious or nervous about receiving a pacemaker. Remember that your pacemaker system can be a great source of reassurance for you and your friends and family.

Talking with other pacemaker patients is often helpful while adjusting to your new device. Ask your doctor, nurse, or Boston Scientific representative if there is a local pacemaker patient support group in your area.

The information presented in this handbook is intended to help you understand more about your heart condition and your device. If you have questions about what you have read, be sure to ask your doctor or nurse. They are your best resource for information about your particular needs or situation.

Symbols on packaging

	Date
	Health care center or doctor
	Manufacturer
	Person identification

Notes and questions

Use this space to write down questions or additional information about your device:

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