

Pacemakers: Patients' Common Questions and Answers

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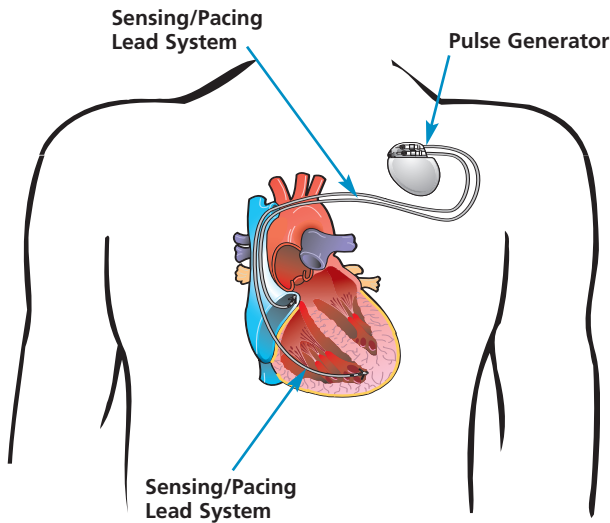
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Q: Where in the body are pacemakers implanted? How do they work?

A: What is generally considered a pacemaker is actually a pacing system made up of four important components—the *pulse generator*, the *pacing leads*, the *programmer*, and, of course, the patient. The pulse generator is implanted in the upper chest (on either side of the body) just below the skin near the collarbone. The leads are thin wires that are inserted through a vein and connect the generator to the heart. The pulse generator contains the battery and the electronic circuitry, or brain, which directs the battery to send electrical pulses through the leads. In turn, this stimulates the heart and causes it to beat at a normal rhythm. The leads also pick up the patient's own heart rhythm and transmit this information to the generator, which adapts its responses



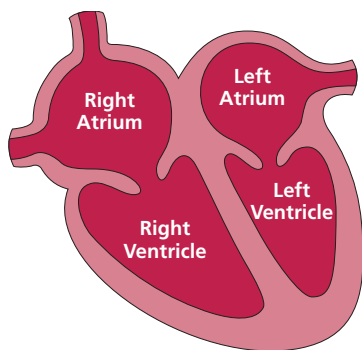
to the patient's needs. The final component is an external tabletop computer called a programmer. A doctor can use this to change pacemaker settings during follow-up patient visits without the need for further surgery.

Q: How do people know if they need one?

A: A pacemaker is prescribed when the heart's electrical conduction system malfunctions and causes the heart to beat too slowly. Sometimes, a dangerously slow rhythm is discovered during a routine checkup without the patient being aware of a problem. This is because it developed slowly and enabled the body to adapt. This might be thought of like driving a car on the freeway or highway in first gear; it goes, but it doesn't go very well. Symptoms, when present, vary. They often include lightheadedness, shortness of breath, fatigue, weakness, fainting or near-fainting spells, and an inability to participate in heavy physical activity. These symptoms may be due to many different causes. Pacing is indicated only when symptoms are caused by a persistent or intermittently slow heart rhythm. To determine whether a pacemaker is needed, doctors administer an *electrocardiogram (ECG)*, which provides a graphic representation of the heart's rhythm. Often, a recording of the heart rhythm taken over 24 hours, with a device called a Holter monitor, is recommended to catch infrequent symptomatic episodes. On occasion, it is necessary to put in a temporary pacing system to directly evaluate the heart's electrical system.

Q: What is the age and gender of people who get their first pacemaker?

A: The need for pacing may occur at any age. There are infants born with a short circuit between the upper (*atrium*) and lower (*ventricle*) chambers of the heart who need a pacemaker at birth. Usually, however, the need for pacing increases as people get older. Think of the conduction system in the heart as being similar to the wiring in a house. As a system gets older, some wires fray and need to be replaced. As people get older, the conduction system can deteriorate. The pacemaker functions as a substitute for the wiring system in the heart. The need for pacing is divided equally between men and women.



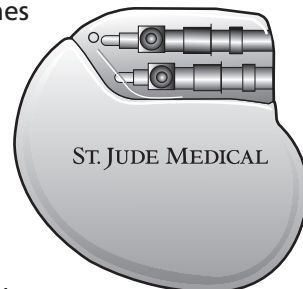
Q: How long does a pacemaker last? How many can a person expect to have in a lifetime?

A: Pacemakers can last anywhere from 2 years to 10 years or more—on the average about 6 years. The longevity depends upon how hard the battery inside the pulse generator has to work. This is affected by how much energy is required to pace the heart and how the system is programmed. Thanks to

ongoing research and development, the life of pacemakers continues to increase while their size continues to decrease, making them more comfortable for patients.

Q: How big are today's pacemakers?

A: A typical pacemaker is very small—often less than 2 inches wide and a quarter-inch thick, roughly the size of two silver dollars stacked on top of one another. Once implanted in the upper chest just below the skin near the collarbone, it is nearly invisible to the eye.



Q: Are there different kinds of pacemakers for different activity levels?

A: The variety of today's pacemakers mimics the wide range of lifestyles and activity levels of the people who use them. People who enjoy walking, playing golf, or swimming needn't worry. Doctors can provide patients with pacemakers to meet their individual needs. The type of pacemaker that's best for a patient is decided by the physician, based upon why the pacemaker is needed, other medical conditions, and how often the heart is likely to need assistance from the pacemaker.

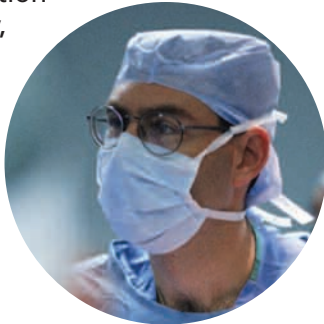


Q: Can people hear and feel pacemakers “tick” inside of them?

A: After a pacemaker is implanted, the patient will probably be aware of it for a while. This is a normal feeling and will lessen with time. However, the pacemaker does not make sounds; no one will be able to hear it.

Q: Are there risks involved in the implant surgery? How long does the surgery take? How long is the recovery time?

A: Implanting a pacemaker is considered minor surgery. This common procedure is usually done in an operating room or in a cardiac catheterization laboratory. Generally, the patient is given a mild sedative (like a sleeping pill) and a local anesthetic is used to numb the area. While it is minor surgery, problems occur in a very small percentage of implants. Surgery generally takes 1 to 2 hours, and patients go home anywhere from several hours to several days later. Complete recovery can take a few weeks.



Q: Can pacemaker patients live an active lifestyle of jogging, tennis, skiing, etc.? What if they do something that is too strenuous for the pacemaker to handle?

A: Typically, pacemaker patients can continue to lead active lives. If they did it before, more likely than not, they'll be able to continue. In fact, they should be able to



participate in most activities, but should check with their doctors, who can advise them of their limits and the signs that appear if they exceed them.

Common sense is the rule.

Because patients' energy levels may increase after the pacemaker is implanted, they may be able to do more than they have been able to do for some time. If there are special activities that a patient would like to participate in, this needs to be discussed with the physician prior to the procedure, as it may affect both the device that is selected and how it is implanted. One example involves hunters who use rifles. In this case, the pacemaker should not be put in the upper chest area, where the recoil can permanently damage the pacemaker.

Q: Do they place any limitations on patients' sex lives? Can people take Viagra® if they have a pacemaker?

A: Other than a brief stay in the hospital, followed by a short recovery period, pacemakers typically don't have any adverse effects on patients' sex lives. In fact, if a patient's sex life was limited before the pacemaker due to a very slow heart rate, it may be significantly better after the



pacemaker is implanted because the body will have more energy. As for Viagra®—or any other drug—people should consult their doctors as to whether it's appropriate for them, and whether there are any potential interactions with cardiac drugs they may be taking.

Q: Are there any diet restrictions?

A: For overall heart health, doctors recommend following a diet that's low in sodium, fat, and sugar, and high in fiber and carbohydrates.

Q: Do pacemaker patients have to stay away from things like magnets, microwaves, and strobe lights?

A: Pacemakers cannot be damaged by using properly operating household appliances, such as microwave ovens, electric blankets, and most power tools. Using electric arc welders or working on automobile ignition systems also will not damage pacemakers; however, there is a possibility that they may briefly interfere with proper pacemaker operation. Some medical equipment also may interfere with the function of the pacemaker. If a patient becomes lightheaded or feels *palpitations* (rapid, irregular heartbeats), he or she should simply turn the device off or walk away from it, and normal pacemaker operation should resume. If using the



problematic equipment is something that the patient cannot avoid, a physician can tell the patient what to do or contact the device manufacturer for guidance. Most pacemaker manufacturers have engineers who can determine if the electrical field generated by the equipment can interfere with the pacemaker.



Q: Can pacemaker patients use cell phones?

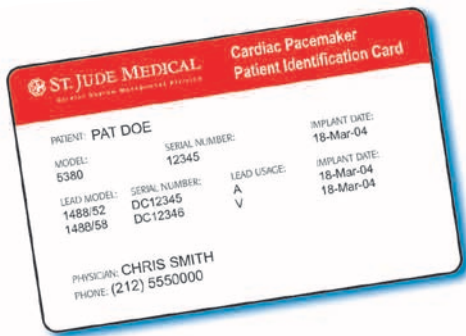
A: Cellular phones, which send electromagnetic signals, can interfere with proper pacemaker operation. However, simple precautions—such as not carrying the phone in a breast pocket over the pacemaker and holding it to the ear that is farthest from the pacemaker—minimize the risk. Also, some pacemaker manufacturers put special filters in their pacemakers to prevent cell phone interference.

Q: Can pacemakers set off airport security and interfere with aviation navigation equipment?

A: Pacemaker recipients can travel without restrictions. Pacemakers do not prohibit them from traveling, nor do they interfere with aviation

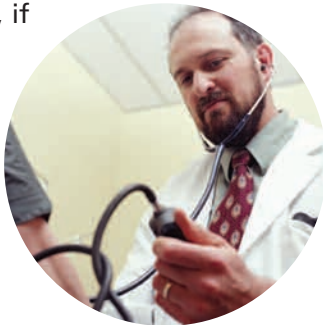


navigation equipment. Passing through the metal detector at airports will not damage a pacemaker, but the metal in it may sound the alarm. If this happens, patients simply show security personnel their pacemaker ID card.



Q: How do doctors monitor pacemaker performance?

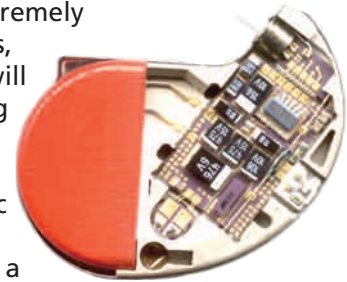
A: It is important to check a pacemaker periodically to make sure that it's functioning properly and that its settings remain appropriate for the patient's medical needs. Doctors typically schedule follow-up visits that include a brief physical examination, an electrocardiogram, and a detailed evaluation of how well the pacemaker is performing. They can easily and non-invasively retrieve this information and, if necessary, adjust the pacemaker's settings, using a specialized programmer. Some doctors also utilize telephone monitoring, in which they obtain



information about the pacemaker's operation and battery condition over the phone electronically. Checking the pacemaker is equivalent to your doctor checking you for any other medical condition. Just as doctors may need to change the dosage of a medication, so they may need to change the settings of a pacemaker.

Q: How do patients know if they need a new pacemaker?

A: Pacemakers are extremely dependable devices, and a pacemaker will give ample warning if its battery is low. This is one of the reasons for periodic evaluations, either by telephone or by a more extensive evaluation in the physician's office. Most pacemaker systems will continue to function normally for 3 to 6 months after the point where the battery is signaling a low level that calls for replacement. Doctors, therefore, can offer patients a time window of several months in which to schedule a simple procedure to replace the pulse generator.



Q: How many people in the world have pacemakers?

A: The number exceeds 2 million. There are 300,000 implants each year all over the world, some of which are replacements.