



Pacemaker

How does the heart naturally pace?

The sinoatrial (SA) node in the upper-right chamber, or right atrium, of the heart, sends an electrical signal that causes your heart to contract (beat). This node is often called the heart's "natural pacemaker."

When the natural pacemaker releases its signal, the atria (upper chambers of the heart) contract and the signal passes through the atrioventricular (AV) node where it is checked and then passed into the muscles of the ventricle (lower chambers of the heart), causing them to contract.

The SA node does its best to maintain your heart rate at a steady (constant) pace, but many factors can affect its capabilities, such as stress, hormones, or physical demands. At times, the SA node fails and causes the heart to beat irregularly, either too fast or too slow. There are other times when the heart's electrical pathways are impeded, causing an irregular heartbeat.

How does an implantable pacemaker work?

A pacemaker, a small but mighty life-changing device, helps the heart maintain a regular rhythm. Pacemakers can pace the upper and lower chambers of the heart. It is composed of 2 parts: a pulse generator that includes a battery and circuitry and 1-2 leads (wires) that connect to the heart wall.

The pacemaker is implanted near the collarbone, and 1-2 leads may be necessary, depending on the condition. If one lead is needed, it will be inserted into the right ventricle (lower-right chamber); if two leads are needed, the additional lead will be inserted in the right atrium (upper-right chamber). All leads will be connected to the pacemaker and will move signals to the heart to help with heartbeat pacing.

Most pacemakers are "demand pacemakers" and will regulate their usage based on the heart's need, automatically turning on and off.

Inserting a pacemaker is a quick procedure (1-2 hours) and is performed under local anesthesia (meaning the area where the device is implanted is numbed).



Are regular check-ups needed?

Check-ups are needed and can occur in different ways:

1. Trans-telephonic monitoring can be done over the phone but needs to be followed up by a doctor's visit.
2. A device called a programmer is held over the pacemaker to check its usage and edit the settings if needed.

Batteries in a pacemaker need to be replaced every 7-8 years, at which time a new pacemaker is installed. New leads are typically not necessary.

What will affect the operation of my pacemaker?

Certain devices **will affect** the pacemaker's operation:

- Power-generating equipment
- Welding equipment
- Certain dental equipment
- Magnetic resonance imaging (MRI) machines
- Radiation machines for treating cancer
- Heavy equipment or motors that have powerful magnets

Many devices have **will not affect** your pacemaker:

- CB radios
- Electric drills
- Electric blankets
- Electric shavers
- Ham radios
- Heating pads
- Metal detectors
- Microwave ovens
- TV transmitters
- TV remote controls
- X-ray machines
- Airport security detectors



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The American Heart Association recommends that all patients with pacemakers monitor their environment and watch for potential threats. The advent of cell phones has caused new concerns, so doctors advise that you keep your cell phone at least 6 inches away from your pacemaker even though there is thought to be no risk. Some newer phone technologies may cause pacemaker issues, but more research is needed.