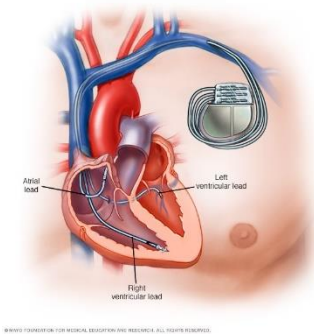


# Permanent Pacemaker Implantation



An implanted electronic pacemaker mimics the action of your natural electrical system. A pacemaker comprises two parts:

- **Pulse generator.** This small metal container houses a battery and the electrical circuitry that regulates the rate of electrical pulses sent to your heart.
- **Leads (electrodes).** One to three flexible, insulated wires are each placed in a chamber, or chambers, of your heart and deliver the electrical pulses to adjust your heart rate.

Pacemakers work only when needed. If your heartbeat is too slow (bradycardia), the pacemaker sends electrical signals to your heart to correct the beat.

Also, newer pacemakers have sensors that detect body motion or breathing rate, which signal the pacemakers to increase heart rate during exercise, as needed.

## During the procedure

You'll likely be awake during the surgery to implant the pacemaker, which typically takes a few hours. You'll have an intravenous line placed, through which you might receive medication to help you relax.

Most pacemaker implantations are done using local anesthesia to numb the area of incisions. Your chest is cleaned with special soap.

One or more flexible, insulated wires are inserted into a major vein under or near your collarbone and guided to your heart using X-ray images. One end of each wire is secured to the appropriate position in your heart, while the other end is attached to the pulse generator, which is usually implanted under the skin beneath your collarbone.

## After the procedure

You'll likely stay in the hospital for one night after having a pacemaker implanted. Your pacemaker will be programmed to fit your pacing needs. Arrange to have someone drive you home when you're discharged.

Most pacemakers can be checked remotely. Your pacemaker transmits to and receives information from your doctor's office, including your heart rate and rhythm, how your pacemaker is functioning, and its remaining battery life.

Your doctor might recommend that you avoid vigorous exercise or heavy lifting for about a month. Avoid putting pressure on the area where the pacemaker was implanted. If you have



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pain in that area, ask your doctor about taking over-the-counter medicines, such as acetaminophen (Tylenol, others) or ibuprofen (Advil, Motrin IB, others).

## Special precautions

It's unlikely that your pacemaker would stop working properly because of electrical interference. Still, you'll need to take a few precautions:

- **Cellphones.** It's safe to talk on a cellphone, but keep your cellphone at least 6 inches (15 centimeters) away from your pacemaker. Don't keep your phone in a shirt pocket. When talking on your phone, hold it to the ear opposite the side where your pacemaker was implanted.
- **Security systems.** Passing through an airport metal detector won't interfere with your pacemaker, although the metal in it could sound the alarm. But avoid lingering near or leaning against a metal-detection system.  
To avoid potential problems, carry an ID card stating that you have a pacemaker.
- **Medical equipment.** Make sure all your doctors and dentists know you have a pacemaker. Certain medical procedures, such as magnetic resonance imaging, CT scans, cancer radiation treatment, electrocautery to control bleeding during surgery, and shock wave lithotripsy to break up large kidney stones or gallstones could interfere with your pacemaker.
- **Power-generating equipment.** Stand at least 2 feet (61 centimeters) from welding equipment, high-voltage transformers or motor-generator systems. If you work around such equipment, ask your doctor about arranging a test in your workplace to determine whether the equipment affects your pacemaker.

Devices that are unlikely to interfere with your pacemaker include microwave ovens, televisions and remote controls, radios, toasters, electric blankets, electric shavers, and electric drills.