



Pacemaker Implantation

Basic Facts

More than 3 million people worldwide currently rely on pacemakers to correct a slow, irregular, or otherwise abnormal heartbeat.

Pacemakers are implanted in people with chronic conditions that cause persistent or intermittent slowing of the heart rate.

The procedure is performed on an outpatient basis and rarely causes complications.

Once the pacemaker is fully adjusted, the person should be able to carry out all the functions of normal daily life, with the pacemaker automatically adapting to various circulation and heartbeat needs.

If heart muscle cells are damaged such that electrical rhythms to the heart are interrupted, delayed, or sent down the wrong path, the heartbeat may become irregular, too fast, or too slow. The patient may require a pacemaker, a device to restore a normal heartbeat. Most pacemakers are installed to counteract problems with either failure of cardiac impulse formation or failure of the atrioventricular node (A-V node) conduction.

WHEN IS THE PROCEDURE INDICATED?

A pacemaker may be indicated in the following situations:

- People with temporary, intermittent, or persistent conditions that interfere with their heart's ability to initiate or properly distribute electrical signals;
- People with congenital, as well as acquired, heart problems that result in bradycardia (a slow heartbeat, fewer than 60 beats per minute) or an otherwise uneven heart beat (tachyarrhythmia);
- People receiving drug therapy for other heart conditions, such as beta-blockers, to prevent related bradycardia; and
- People with recurrent syncope (fainting).

Some viral infections can damage the heart such that a pacemaker needs to be inserted.

PRE-TREATMENT GUIDELINES

The patient needs little preparation other than to communicate how he or she is feeling on the day of the operation and inform the physician about all medications taken within the past month. In most cases, patients are advised to avoid eating 12 hours prior to the surgery.

WHO IS ELLIGIBLE?



Patients likely to receive a temporary pacemaker are those who have a high risk of developing A-V conduction failure. Patients likely to receive a permanent pacemaker include those who have:

- Permanent or intermittent A-V block;
- Exercise-induced A-V block;
- Sinus node dysfunction;
- A history of atrial fibrillation, atrial flutter, tachycardia (very rapid heartbeat) associated with A-V dysfunction, or bradycardia associated with congestive heart failure;
- A history of asystole (lack of heartbeat) with fainting;
- Recurrent fainting.

Because pacemaker implantation usually is a relatively straightforward, minimally invasive procedure, there are very few heart patients for whom receiving a pacemaker would be inappropriate.

WHAT TO EXPECT

Insertion of a temporary pacemaker, an external device, is usually done while the patient is in the hospital for a related heart condition. This procedure can take place at the patient's bedside. First, the physician administers a sedative and a local anesthetic to prevent pain at the insertion site, which is cleaned and shaved to prevent infection. Next a catheter is inserted, usually into a vein in the neck or groin area, and guided to the heart. The catheter used for this purpose has metal tips that can deliver electrical signals to pace the heartbeat.

A permanent pacemaker insertion is considered minor surgery, and can be done on an inpatient or an outpatient basis. The procedure may be performed in an electrophysiology laboratory, operating room, or outpatient surgical facility. The patient is given a local anesthetic, and the insertion site is cleaned and shaved. In most cases, the pacemaker is inserted beneath the skin on the front of the chest under the clavicle (collarbone). The physician will incise the chest wall just below the clavicle to create a small pocket, into which the pacemaker is placed. Wires attached to the pacemaker (pacemaker leads) are then passed through a vein in the upper chest and directed to the right atrium or right ventricle. The leads, which are used to stimulate the contractions of the heart, are then attached to the inner surface of the heart chamber using small screws or tines. Following insertion, the skin is closed with sutures or staples.

POST TREATMENT GUIDELINES AND CARE

A hospital stay of 1 to 2 days may be required for the physician to confirm that the patient's condition is stable and the pacemaker is functioning. All patients will be advised not to twist or otherwise manipulate the pacemaker or interfere with the healing of the incision site. The physician may also perform one or more tests. An x ray, ECG, and echocardiogram help make sure the pacemaker and leads are in the proper location and working correctly.

POSSIBLE COMPLICATIONS



The overwhelming majority of pacemaker insertions are successful. Although complications happen in only 1 to 2 percent of procedures, they can include:

- Severe bruising or bleeding;
- Formation of blood clots;
- Stroke;
- Heart attack;
- Tearing of a blood vessel;
- Puncturing of the lung or heart muscle;
- Introduction of air into the space between the lung and chest wall (which could lead to embolism);
- A lead wire dislodging from the heart;
- Infection of the pocket into which the pacemaker was placed; and
- Pacemaker malfunction such as loss of capture (i.e., the ability to pace the heart), abnormal pacing rate, undersensing, and oversensing) are rare occurrences.

People with pacemakers are at a higher risk of blood infections than people without pacemakers.