



This sheet explains what a pacemaker is, why it is needed and how we implant it.

### Key points

- A pacemaker is a small electronic device that makes the heart beat more regularly.
- Pacemakers help to make a slow heart beat faster.
- They work by giving the heart a small, painless electrical impulse to bring the heart beat back to a regular rhythm.

### What is a pacemaker?

- A pacemaker is a small electronic device (called a generator) placed under the skin of either the chest or abdomen (belly) (see Figures 1 and 2).
- We place wires (called leads) through the veins into the heart. Or, we sew the wires onto the outside of the heart.
- These wires provide painless electrical pulses to help the heart beat more regularly.

### Why would my child need a pacemaker?

- Pacemakers help to make a slow heart beat faster.
- They can also help when the heart muscle beats irregularly (called a dyssynchronous heart) and is not pumping well (called ventricular dysfunction or heart failure).

### What are the kinds of pacemakers?

- **Single chamber pacemakers:** This has 1 wire going to either the top part of the heart (atrium) or the bottom part of the heart (ventricle).
- **Dual chamber pacemakers:** This uses 2 wires. One wire goes to the atrium, and another goes to the ventricle. The pacemaker helps the top and bottom part of the heart beat more regularly.
- **Cardiac resynchronization pacemakers:** This uses 3 wires. A wire goes to the atrium, and 2 wires go to the ventricles. This helps the ventricles contract in a more coordinated way and get more blood out of the heart.

### How is a pacemaker implanted?

How we put the pacemaker in is based on your child's size and anatomy. We can place it either through the veins (transvenous) or on the heart's surface (epicardial).

- **Transvenous pacemaker:** We insert 1 or more leads through a big vein below the collarbone. We then guide them to the heart and attach them to the heart muscle. The leads connect to a generator under the skin (Figure 1).

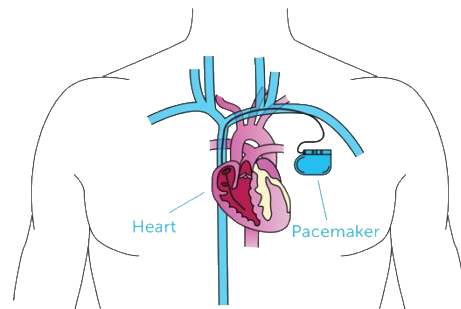


Figure 1.

- **Epicardial pacemaker:** A cardiac surgeon attaches 1 or more leads to the heart's surface through an incision in the chest. We connect the wires to a generator, usually placed under the rectus muscle (the "six-pack" on the belly) (Figure 2).

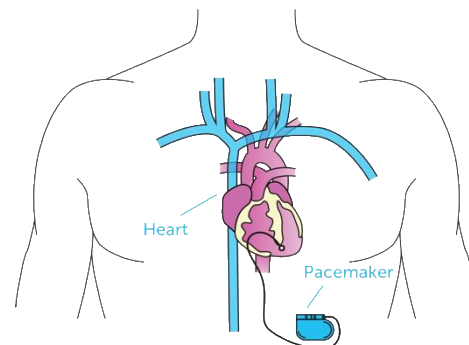


Figure 2.

### How long will my child stay in the hospital after the procedure?

- **For transvenous pacemakers:** Your child will stay overnight in the hospital. We'll do a chest X-ray the next morning and check the pacemaker to be sure it's programmed the right way.
- **For epicardial pacemakers:** Your child will stay in the Cardiac Intensive Care Unit (CICU) for 1–2 days and then moved to a different unit. They will probably spend 5–7 days in the hospital recovering from the surgery.
- This recovery time lets us make sure the incision is healing well and that any pain is under control.

- The team will also make sure your pacemaker is working and programmed the right way.

## How long will the pacemaker last?

- Pacemaker batteries last 5 to 8 years. How long it lasts depends on how it is programmed and used.
- The leads are made to last 10-15 years. Young people and those with congenital heart disease (CHD) may have their leads wear down faster.

## Should I avoid electronics?

- You should keep all electronics and magnets 6 inches away from the generator to prevent interference with the pacemaker.
- Some power tools and large electromagnetic tools have different rules. Check your pacemaker booklet for information about these kinds of tools, or ask your care team.

## What happens next?

- You'll learn how to send transmissions from your child's pacemaker so we can check on it remotely (from our office) every 3 months. We'll also need to see your child in person every year.

## Contact us

- **Monday–Friday:** Please call the Pacemaker Office at 617-355-4676 between 7 a.m.- 4 p.m.
- **After hours or if your call is urgent:** Please call the hospital operator at 617-355-6369 and page the electrophysiology (EP) doctor on call (pager #3737).