



Pacemaker

A Guide for Patients and Families

What is a pacemaker?

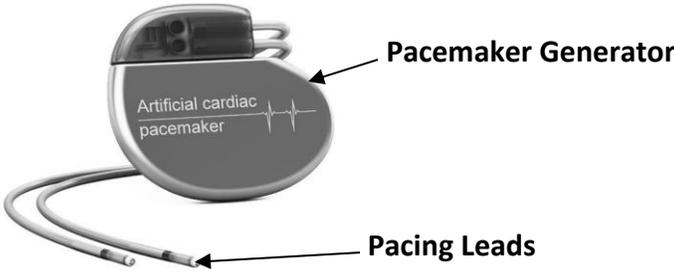
A pacemaker is a small electronic device that helps your heart beat at the right rate. When needed, it sends an electrical impulse to your heart, triggering a heartbeat.

A pacemaker has two parts: a generator and pacing leads.

1. The **generator** is a small computer that monitors your heart beat. When needed, it sends an electrical impulse through the pacing lead to your heart, triggering a heartbeat. It is powered by a specially designed battery.
2. The **pacing leads** (you may have 1 or more) are insulated wires. One end connects to the generator. The other end attaches to the inside of your heart. An electrical impulse from the generator travels down the lead to make the heart beat.

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Why do I need a pacemaker?

- ♥ Your heart has an electrical system made up of special cells. It signals your heart muscle to squeeze or contract to pump blood and oxygen to your body.
- ♥ Sometimes this system is damaged by aging or heart disease. This can result in:
 - A slower than normal heart rate (bradycardia)
 - Long pauses between beats (heart block)
 - Switching between slow heart beats (bradycardia) and fast heart beats (tachycardia)
- ♥ If your electrical system is not working well, it can cause you to feel tired, dizzy, faint, or short of breath. The pacemaker helps keep your heart beating properly.

Are there any risks?

- ♥ The procedure to insert a pacemaker is called implantation. A pacemaker implant is considered a routine, minor surgical procedure with little chance or risk of problems. Bruising around the implant site is common.
- ♥ However, as with any medical procedure, problems are possible. Although rare, these problems are important to know (listed here from most likely to least likely):

Problem	Chance of it happening	How it is treated
Pacing lead becomes dislodged	2 to 4% chance (20 to 40 people in 1000)	Another procedure would be needed to put the lead back into position.
Bleeding around the pacemaker site (hematoma)	1 to 2 % chance (10 to 20 people in 1000)	Sometimes the bleeding around the pacemaker is large enough that the blood needs to be drained off.
Collapsed lung (pneumothorax)	1 to 2 % chance	Chest x-ray is done after the procedure to check for this. Often, it does not need to be treated, but it might need a drain into the chest to help the lung return to normal.
Infection	1 to 2 % chance	To prevent an infection, everyone is given antibiotics before the procedure. They may be required after the procedure is an infection occurs
Collection of blood around the heart (cardiac tamponade)	0.1 % (1 person in 1000)	Often, it does not need to be treated, but it might need to be drained.

- ♥ **It is important to ask your doctor about the risks of a pacemaker implant in your specific situation.**

What can I expect before and after?

How to prepare for the procedure

- ♥ Always bring your BC Services Card (or Care Card) plus a list of the medications you are currently taking to every appointment and the day of your procedure.
- ♥ You will not be allowed to drive for at least 1 week following the pacemaker implant.
- ♥ Since you **cannot** drive home after your procedure, **arrange for someone to drive you** to the hospital and home again.
- ♥ You also need to **arrange for someone to stay with you** at home for the first 24 hours after the procedure.
- ♥ You will get more specific instructions from the hospital or office of the doctor doing the procedure.
- ♥ You will be instructed as to how to take your medications before the procedure. Certain medications (like blood thinners and diabetic pills) might need be adjusted. It is important to review these instructions carefully and take medications as directed.
- ♥ A week or so before the procedure, you might be asked to go for some blood work and an electrocardiogram (E.C.G.).
- ♥ **Do not** eat or drink anything the morning of your procedure, unless you have been specifically told something different by the hospital or your doctor.

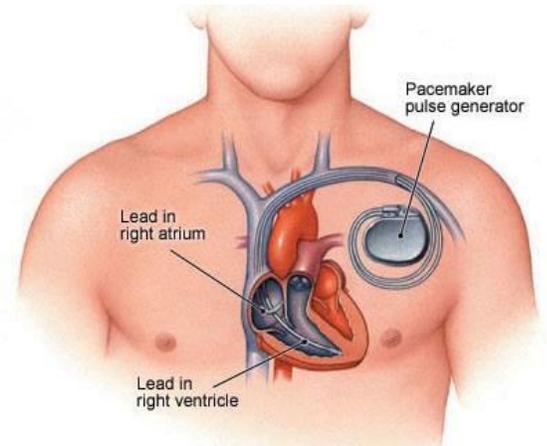
Before the procedure

- ♥ You are admitted and directed to the procedure waiting area.
- ♥ If you are already a patient in hospital, your healthcare team will help you get ready for the procedure.
- ♥ A nurse starts an intravenous (I.V.) in one of your arms to give you medicines during the procedure.
- ♥ You have bloodwork drawn and an electrocardiogram (ECG).
- ♥ The doctor reviews the procedure and then you will be asked to sign a consent form.



During the procedure

- ♥ Most people are awake for the procedure. You are given a medicine to help you relax and feel comfortable.
- ♥ The doctor injects numbing medicine under the skin to freeze the area where the pacemaker is being implanted.
- ♥ A small cut or incision is made on the right or left side of the upper chest just below your collarbone. Your doctor talks with you beforehand about which side is best for you.
- ♥ The doctor uses a special x-ray to guide the pacing lead(s) through a large vein and into your heart.
- ♥ Once the leads are attached (implanted) in the inside of the heart, they are tested to make sure they are working correctly.
- ♥ The pacemaker generator is then placed in a space under the skin. The incision is closed with stitches that dissolve on their own over time.
- ♥ The procedure takes about 1 hour.



After the procedure

- ♥ You are moved to a recovery area. The nurses there monitor your heart rhythm and blood pressure.
- ♥ You might feel some discomfort around the incision and you might have a sore shoulder. Let the nurses know if you are having any pain so they can give you medicine to relieve it.
- ♥ The nurses let you know when it is safe for you to eat and drink.
- ♥ You might go home from this area or you might be moved to another unit if you need to stay in the hospital longer.

Going Home

- ♥ How soon you go home depends on your medical condition and recovery from the procedure. Most people go home the same day. Some people need to stay in the hospital for a few days.

♥ Before you leave hospital, you are given instructions on how to care for yourself at home. The nurse reviews this information with you and it includes :

- Caring for yourself at home
- Driving restrictions
- Caring for your incision
- Restrictions to arm movements
- Managing pain
- Pacemaker clinic follow-up appointments
- When to take medications
- When to get help

Note: The person staying with you for the first 24 hours should be there to hear these instructions.

When to get help

♥ Contact your family doctor **right away** if you notice any of the following:

- Any redness, swelling, or coloured liquid coming from your incision
- A fever over 38.0°C (100.4°F)
- New bruising or redness around the incision
- Pain that gets worse or does not improve with pain medicine
- Shortness of breath
- Chest pain

♥ Contact your pacemaker clinic right away if you notice any of the following:

- Feel faint
- Feel dizzy
- Heart skipping beats (palpitations)

Call 9-1-1 or have someone take you to the nearest emergency room if you do not feel well or you feel worse from any of these above concerns. (**Do not** drive until you have been checked).

Living with a pacemaker

People who receive a pacemaker can return to their normal activities of daily living. Below are tips to help you stay healthy.

Attend follow-up appointments

♥ Every person with a pacemaker needs to be checked regularly by a pacemaker clinic. This could be a mix of in-person clinic visits and remote monitoring from home.

- ♥ Remote monitoring is a way for your pacemaker to send information about your heart activity wirelessly from home. Your information is sent through a secure connection to a secure website. If this is an option for you, the pacemaker clinic team will help you to get started.
- ♥ Before you leave the hospital, speak to your nurse or doctor about the pacemaker clinic closest to your home.
- ♥ Your first appointment will be within 2 months. After this, your pacemaker must be checked by the clinic at least once every year.
- ♥ Let your clinic know of any changes in your address or phone number.
- ♥ During visits to the clinic, the clinic team:
 - Check your pacemaker battery and leads.
 - Review your settings to make sure it is programmed to best meet your needs.
 - Adjust the pacemaker settings as needed.

Protect your pacing leads

- ♥ The movement of your arm on the same side as your pacemaker may be limited for a period of time after the procedure. The instructions from the hospital will include what you can and cannot do.
- ♥ For at least 6 weeks after the procedure, you are not allowed to do any strenuous shoulder activities like golfing, swimming, tennis, shovelling, raking, or vacuuming.
- ♥ These restrictions prevent the pacing leads from being dislodged.

Protect your pacemaker generator

- ♥ **Do not place magnets near your pacemaker. Keep magnets at least 6 inches from the generator.**
- ♥ **Never** put a cell phone in a pocket over your pacemaker.
- ♥ **Walk through anti-theft detectors** at a normal pace without any delay. Do not remain in or near the system for any length of time. They have electromagnetic fields and can temporarily affect your pacemaker.
- ♥ **Keep the generator away from these items:**
 - **At least 6 inches (15 cm) away** - hand held electric kitchen appliances (e.g. mixers and knives), electric toothbrush charging bases, electric shavers, exercise bikes and treadmills, hand held hair dryers, stereo speakers, vacuums, sewing machines, and radio-controlled items (including the antenna).

- **At least 12 inches or 1 foot (30 cm) away** - electric fences, vehicle ignition systems, green electrical transformer boxes found outside, car battery chargers, generators 20 kW or less, uninterruptible power sources (UPS), and gasoline powered tools (e.g. chainsaws, lawn mowers, weed trimmers, and snow blowers).
- **At least 24 inches or 2 feet (60 cm) away** - induction cook tops, jumper cables, bench mounted or free-standing power tools with 400hp motors or less (e.g. air compressors, drill presses, grinders, pressure washers, table saws, and welding equipment with currents under 160 amps).
- ♥ **Do not use:** TENS machines, magnetic mattresses or pillows, muscle stimulators.
- ♥ **Stay away from** large magnets such as the ones found on cranes or in junkyards to lift cars.
- ♥ If you work in any **high voltage areas**, talk to your doctor or pacemaker clinic. High voltage is found around things like arc welders, smelting furnaces, radio and television towers, and hydro and radio stations.

Tell others you have a pacemaker

- ♥ At the hospital, you are given a temporary pacemaker identification card describing what type of pacemaker you have. **Always carry this ID with you.**
- ♥ The company that made your pacemaker will mail you a permanent Pacemaker Identification card about 4 to 8 weeks after your procedure.
- ♥ Always tell your dentist, physiotherapist, massage therapist, and chiropractor you have a pacemaker. They might need to take special precautions before starting certain medical procedures or therapies.

Take your medications

- ♥ Make a list your medications, the dosage, and the times you take them.
 - Always bring this list to all your pacemaker follow-up appointments.
 - Remember to update your list when they change
 - Take them exactly as instructed.

Stay active

- ♥ Most people return to their usual daily activities, once they have recovered. Include physical and mental activity into your daily schedule.
- ♥ Each person is unique. Talk to your doctor about the kind of activities and exercises that are best for you. **Start slowly and gradually increase.**

- ♥ For most people, it is safe to resume sexual activity after a pacemaker implant, however try not to support your weight with your arms during sexual activity while your incision is healing.

Ask questions

- ♥ Call your heart doctor or family doctor.
- ♥ Call your Pacemaker Clinic.
- ♥ Call HealthLink BC at 8-1-1 any time of the day or night to speak to a registered nurse. During the night, you can ask to speak to a pharmacist.
- ♥ Pacemaker companies offer online support for non-urgent questions or concerns. Their contact information is available online or in your pacemaker information booklet.

Frequently Asked Questions

When can I drive?

- ♥ For your own safety and the safety of others, you must follow the mandatory driving restrictions in the *British Columbia Motor Vehicle Act*.
- ♥ The Act says that after a pacemaker implant:
 - You are not allowed to drive a private vehicle for 1 week after the procedure (class 5 license).
 - You are not allowed to drive a commercial vehicle for 1 month after the procedure (class 1 to 4 license).

What is electromagnetic interference (EMI)?

- ♥ Any items that generate, transmit, or use electricity have invisible electromagnetic fields around them. This electromagnetic field might affect the normal operation of your pacemaker. This is called 'electromagnetic interference' (EMI).
- ♥ Most household items are safe to be near and use, including items such as: battery chargers, curling irons, hair straighteners, electric blankets, guitars or toothbrushes, massage chairs, heating pads, hot tubs, saunas, tanning beds, electronic weight scales, and kitchen appliances including microwave ovens.
- ♥ It is also safe to be near and use electronics such as TV's, radios, computers, tablets, MP3 players, fax machines, photocopiers, DVD and CD players with remote control, printers, and GPS devices.

What do I do if I think an item is causing EMI?

- ♥ If you feel dizzy using an electrical item, put it down and move away from it. Your pacemaker should return to normal.
- ♥ If you continue to feel dizzy or feel worse, contact your pacemaker clinic or doctor right away.

Can I travel with a pacemaker?

- ♥ It is safe to travel with a pacemaker. Let the pacemaker clinic know if you are planning to travel.
 - Ask how to get help medical help if needed and how to set up your remote transmitter while you are away.
 - It is safe to pass through the airport metal detector, have a body scan and use a hand-held metal detector. If the detector alarms tell airport security personnel you have a pacemaker and show them your Pacemaker ID card

How long will my pacemaker last?

- ♥ The pacemaker battery will need replacing over time. This minor procedure is called a generator (battery) change. Your pacemaker clinic will organize a replacement when needed.
- ♥ The battery generally lasts 8 to 10 years but will depend on how much your body needs the pacemaker to pace your heart. If your pacing leads are working well, they are left in place.
- ♥ Pacemakers do not stop without warning. Even as the battery weakens, your pacemaker continues to work as it should.

What happens to my pacemaker at end of life?

- ♥ Pacemakers do not keep dying people alive. Should your health decline to the point where death is likely, your pacemaker will not prevent a natural death.

For More Information

This booklet explains basic information about living with a pacemaker.

For more detailed information about getting a pacemaker, read the information given to you by your doctor's office or hospital before the procedure.

For more detailed information about your specific pacemaker, read the booklet from the company that made the pacemaker, or visit their website.

If you have questions that are not addressed in this booklet, ask your doctor or clinic.

Helpful Resources

Heart and Stroke Foundation of Canada www.heartandstroke.ca

Canadian Heart Rhythm Society www.chrsonline.ca

Choose 'Pacemakers' from the Main Menu under Heart Rhythm Health Resources or use this link: goo.gl/g4ttVL

Heart Rhythm Society www.hrsonline.org

Choose 'Patient Resources'

HealthLinkBC www.healthlinkbc.ca

Phone: 8-1-1

Phone: 7-1-1 for deaf or hard of hearing

Device Company	Website	Reason	Phone
Medtronic	ENGLISH www.medtronic.ca/patientresources	Questions about your device:	1-800-551-5544
	FRENCH www.medtronic.ca/resourcespatient www.medtronic.com	Questions on troubleshooting Carelink:	1-888-660-4616
Abbott / St. Jude Medical	www.sjm.com	Questions about your device and Merlin:	1-888-276-4170
Boston Scientific	www.bostonscientific.com	Questions about your device and LATITUDE:	1-800-929-4043
Biotronik	www.biotronik.com	N/A	
Sorin	www.livanova.sorin.com	N/A	



Cardiac Services BC

An agency of the Provincial Health Services Authority



Interior Health



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