

**Cardiovascular Implantable
Electronic Devices**

This handout explains what Cardiovascular Implantable Electronic Devices (CIEDs) are and what you can expect if you have one placed.

There are six basic types of CIEDs:

1. Transvenous Implantable Cardiac Defibrillator (ICD)
2. Subcutaneous Implantable Cardiac Defibrillator (S-ICD)
3. Transvenous Permanent Pacemaker (PPM)
4. Leadless Pacemaker
5. His Bundle Pacemaker
6. Implantable Loop Recorder (ILR)

What is an ICD?

An ICD is a small device that sends a strong electrical impulse (shock) to your heart if you have an abnormal, life-threatening rhythm. The shock helps to restore an unsafe heart rhythm back to normal. It can protect you from having more abnormal heart rhythms. The ICD can pace your heart if needed. An ICD has two parts, a battery (generator) and the lead(s).

There are many types of ICDs. Your team will help you decide which is best for you.

A **traditional ICD** is placed under the skin and above the chest muscles. The lead(s) go inside your heart. The number of leads can vary. You may have one lead (single chamber ICD), two leads (dual chamber ICD), or two or three leads for a cardiac resynchronization therapy defibrillator, also called CRT-D.

A **subcutaneous ICD (S-ICD)** is an alternative to the traditional ICD. This is not an option for every person.

Some features of an S-ICD:

- It can't pace your heart.
- The battery is often placed under the skin, near the armpit.
- The lead that sends the electrical impulse (shock) is placed under the skin, across your ribs, and is secured in place. The lead is near the heart, but **not** inside the heart muscle.
- There are less activity restrictions, such as lifting and upper arm movement.

What is a pacemaker?

A pacemaker is a small device that sends electrical signals (impulses) to the upper (atrium) and lower (ventricles) parts of your heart. This helps maintain a safe heart rate (pulse). A pacemaker has two parts, a battery (generator) and the lead(s). If the heart's electrical system is interrupted for any reason, your heart rate and rhythm can change. For this reason, a pacemaker is needed to help treat the problem.

Types of Pacemakers

There are many types of pacemakers. Your team will help you decide which is best for you.

A **traditional pacemaker** is placed under your skin and above the chest muscles. The lead(s) sit inside of your heart. The number of leads can vary. You may have one lead (single chamber pacemaker), two leads (dual chamber pacemaker) or two or three leads for cardiac resynchronization therapy pacemaker, also called CRT-P.

A **leadless pacemaker** is smaller than the traditional pacemakers. It has no leads. It is about the size a multi-vitamin or fishing lure. To place this pacemaker, a vein in your leg is used to get to the lower part (ventricle) of your heart.

A **His bundle pacemaker** is like a traditional pacemaker, but it paces your heart in a more natural way.

What is an implantable loop recorder?

An implantable loop recorder (ILR) is a small device placed just underneath the skin, but not in the heart. It is used for long-term monitoring of the heart rhythm. The ILR is about the size of a few paperclips. It is used to get more information when a person has:

- Unexplained fainting
- Heart palpitations
- Slow or fast heart rhythms
- Unexplained stroke

ILR implant is usually done as procedure with local anesthetic only. No sedation medicine is needed.

Your First Visit

You will visit the clinic and meet with a provider to talk about getting a pacemaker or defibrillator placed. During this visit, you can expect to:

- Have a complete history and physical
- Talk about and plan any labs/tests that you may need before surgery
- Talk about treatment and device options
- Talk about what to expect during surgery
- Sign a consent for surgery.

If you and your provider decide that a cardiac device is the best option for you, we will send a message to our schedulers. They will contact you to schedule surgery. You will either get pre-procedure instructions at this visit, or they will be mailed to you. If you have any questions about the date or time after you leave, call us at (608) 263-9091.

If you take blood thinners such as Coumadin, or other direct-action agents (DOAC) like apixaban (Eliquis®) or dabigatran (Pradaxa®), our nurses will let you know of any changes before surgery. Most implant procedures can be done while on blood thinning medicines; however, the amount you take should be reduced. If you take a DOAC, you may be asked to hold one or two doses. Aspirin and Plavix often do not have to be stopped.

The Day Before Surgery

A nurse will call you the day before surgery (or the Friday before if your surgery is on Monday). They will review your instructions and make sure you know what time to arrive. If you do not hear from one of our nurses by 4 p.m., please call the staff at (608) 263-1530.

Reasons to Call Before Surgery

You should call the clinic if:

- If you have a cold
- If you have a fever greater than 100°F
- If you feel ill the day before surgery

Call our office at (608) 263-9091 between 8:00 a.m.- 4:30 p.m., Monday-Friday. If it is after hours or the weekend, please call (608) 263-1530 to reach the hospital operator. Ask to speak with the Cardiology fellow on call. Leave your name and number, and they will call you back.

The Day of Surgery

Before the procedure starts, there are some things your nurse will do to make sure that you are ready.

- Blood may be drawn for labs.
- An IV will be placed in your hand or arm.
- If needed, a small area around the surgical site will be shaved.
- The surgical site will be cleaned with a special soap.
- You may receive antibiotics through your IV to help prevent infection.

If needed, the nurse will give you medicines and fluids through your IV. These medicines help decrease pain, relax you and make sure you are either asleep or comfortable. Aside from the medicine through your IV, we also use local anesthetic. Sterile drapes are used to cover you from your neck to your feet so that only the surgical site is exposed. For traditional pacemakers and ICDs, the vein under your collarbone is used to get to your heart. This vein is used because it travels to your heart. A small “pocket” is made under your skin for the new device battery (generator) and lead(s) to sit in. The leads are then threaded through the blood vessel into the heart, using x-ray for guidance.

Once the lead(s) is/are in the right place, they are secured. At the end of the procedure, the lead(s) is/are connected to the device battery (generator). The site is closed with stitches most of the time. Staples or a special glue work better in some cases. The whole process often takes 1-3 hours.

You cannot drive home. Be sure to have a ride set up. You can't drive for 1-2 weeks after your procedure. There may be times it is longer.

After Your New ICD or Pacemaker is Placed

After your new device is placed, you will usually stay in the hospital overnight, so we can watch you closely. You will likely have some discomfort/pain after your procedure, but we will work hard to control it.

Before you can go home, there are some things that you must do. These include:

- Your device will be checked, and you may have an x-ray.
- A pharmacist will review your medicine with you.
- A nurse will review your discharge instructions and make sure you understand how to care for yourself.

Restrictions

When a device is first implanted or there are new leads added, you will have restrictions. These allow the device/leads to fully heal in the heart muscle. The healing process happens over time. The restrictions help make sure the device does not dislodge and the leads do not move as healing occurs. Some restrictions vary by person based on the device; see the next page for details.

The most common guidelines are:

- Do not drive for 1-2 weeks. In some cases, it may be more than 1-2 weeks.
- Wear your seatbelt whether you are the driver or passenger.
- For 2 months (or more) after surgery:
 - Do not raise your arm over your head on the side of your device.
 - Do not lift more than 10 pounds (i.e. a gallon of milk) with the arm on the side of your device.
 - Avoid using the arm on the side of your device for strenuous activity.

Restrictions Based on Device

| Traditional Pacemaker and ICD System | S-ICD | ILR | Leadless Pacemaker |
|--|---|--------------------|---|
| <p>See below for limits on using your arm, but keep it moving so it does not get stiff.</p> <p>Plan to wear a sling on the side the device was placed for 1-2 weeks.</p> <p>For the first _____ months, on the side where the device was placed:</p> <ul style="list-style-type: none"> • Do not lift more than 10 pounds (i.e. a gallon of milk) • Do not raise your elbow higher than the level of the shoulder. It is okay to brush your teeth, comb your hair, etc. • Do not reach upward or overhead. Do not reach behind your back. Either of these motions can cause pulling on the newly implanted leads. • For 3 months, no sports. Do not swim, golf, play tennis, or any other contact sports. • You may want to wear your arm sling when you: <ul style="list-style-type: none"> ○ Sleep or nap. This will help to prevent involuntary motions that would lead to raising your arm overhead. ○ Are in public places (i.e. grocery store, restaurant, planned travel). | <p>Do not lift anything heavier than 10 pounds until your incision is healed.</p> | <p>None</p> | <p>For 7 days after the pacemaker implant do not:</p> <ul style="list-style-type: none"> • lift more than 10 pounds • strain or participate in vigorous activity • soak in bathtub, hot tub or go into a swimming pool or lake/river. <p>Incision Care</p> <ul style="list-style-type: none"> • Do not shower for 24 hours. • Remove the Band-Aid over the implant access site before taking a shower. • When able to shower, gently clean the site with soap and water for 3 days. Pat dry and leave open to air. • Look at the site daily for redness, swelling or drainage. |

Wound Care

It is important that you take care of your incision site to prevent an infection.

- Do not use any lotions or ointments on the incision. As the site heals, you may feel itching. This is normal. Do not scratch or rub the site.
- Look at the site daily for signs of infection:
 - Redness
 - Swelling
 - Drainage
 - Warmth over the site
 - Increased tenderness
 - Fever (101° F or greater)
- Do not soak in a bathtub, hot tub, or go into a swimming pool or lake/river.
- Avoid dental work for 1 month.
- The chart below includes more instructions based on how your incision was closed.

Pain

If you have pain at the site, you may take any mild pain reliever that has worked for you in the past, such as acetaminophen (Tylenol[®]) or ibuprofen (Motrin[®]).

Follow-up Visits

You will need a clinic visit 2-4 weeks after your device is placed. The site will be checked to see how you are healing. The device will also be checked. This is called interrogation.

Your follow-up visit is scheduled:

Location _____

Date _____

Time _____

After your first visit, your device will be checked every 3-4 months. There may be times we can alternate clinic visits with home remote checks. We will talk about this more at your first visit.

| Dermabond (Clear Glue) | Bandage | Steri-Strips (thin pieces of tape) | Staples |
|--|--|---|--|
| You may shower the day after your procedure. | <ul style="list-style-type: none">• Leave the current bandage on until _____.• Site should be kept clean and dry. Do not shower for _____ days after the procedure.• When you do shower, let the soap and water run down the incision. Do not scrub or rub the site. | These should be left in place until they fall off on their own or the nurse will remove them at your first visit. | These will be removed in 10-14 days at your first device follow-up clinic visit. |

Device ID Card

You have been given a temporary ID card. The device company will mail your permanent card to you in about 2 months. You should carry your card with you at all times. Be sure to let all people you see for your health and dental care know that you have a permanent cardiac device. This includes all doctors, nurses, dentist, and chiropractors or any other person you see for your health care.

Electrical Hazards

There are certain electrical hazards to be aware of. See below for a list of cautions, things to avoid, and devices that are okay to be around. This is just a partial list. For more information, call your device company. The phone number is on the back of your ID card.

| Do Not | Use Caution | Okay to be Around |
|--|--|---|
| <ul style="list-style-type: none">• Work under the hood of a running car.• Arc weld | <ul style="list-style-type: none">• Therapeutic radiation• Cell phones - These should be 6 inches from your device. Place the phone on the ear opposite of your device or use a headset.• Theft Detection Devices - These are often around the entrances of stores. Walk through them as you normally would. Do not linger near these.• Airport Security - Tell security staff you have a device. Show them the Medical Device ID card.• Magnets - Magnetic snap closures (in jackets), magnetic name badges, and any electronic equipment with a magnetic strip. Anything with a magnet should be 6-8 inches from your device.• MRI (magnetic resonance imaging) | <ul style="list-style-type: none">• Microwaves• Hair dryers• Electric blankets and heating pad• Computers• Radios and TVs |

When to Call

Call your doctor or pacemaker nurse the same day if:

- You feel dizzy, lightheaded, or the symptoms come back that you had before your device was placed.
- If your heart rate drops below the programmed rate, call the Device Clinic. If you cannot get in touch with the clinic, call your local doctor.
- You have any signs of infection.

Who to Call

UW Health: Heart and Vascular Clinic
Monday - Friday 8:00 a.m.- 4:30 p.m., call
(608) 263-1530

After hours, nights, weekend, and holidays this number is answered by the message center. Ask for the cardiology fellow on call. Give the operator your full name and phone number with the area code. The doctor will call you back. If you live outside of the area, please call 1-800-323-8942.

After Having Your Pacemaker or ICD Generator Replaced

If the only thing being replaced is the generator, the old battery (generator) will be removed. A new one will be put in. If there are no problems, you should be able to go home the same day. **Someone will need to drive you.** For the procedure, an incision is made over your old scar. There may be times that a new incision is made. Once everything is tested and the new battery (generator) is in place, the lead(s) is/are reconnected, and the incision is closed.

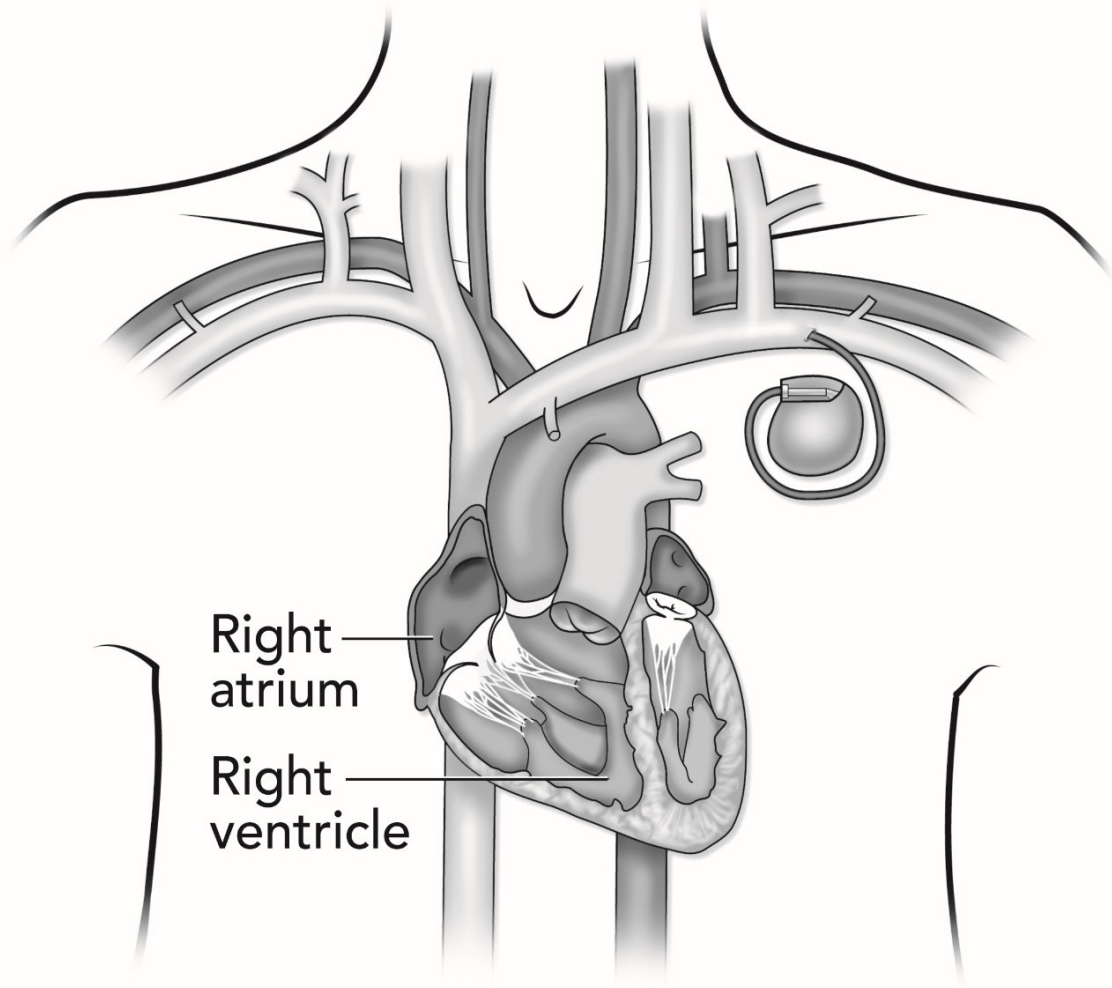
Planning for the Future

Even if your ICD is placed as a precaution, we ask that you fill out advance directives. These are legal forms that clearly state what actions to take if you can no longer make decisions for yourself. A Durable Power of Attorney for Health Care allows you to name someone you know and trust to act on your behalf if you can no longer speak for yourself. The Living Will only covers “end of life” decisions when life-support machines and/or feeding tubes are used.

These forms tell others about your health care wishes and can help guide care. They make it easier for doctors and family members to follow through with your health care wishes. The nurse case manager and/or social worker can help you with these forms if needed.

We encourage you to think about your ICD in case you are diagnosed with a terminal illness or suffer a major injury. You do have the choice to “deactivate” (turn off) the ICD at any point in time. If your ICD is turned off, it will not shock you if your heart goes into an unsafe rhythm, which could lead to a cardiac arrest and even death. This is important to discuss with your family and health care team.

Your Device



Your device: _____

Implant date: _____

For questions about your device, call the device company:

- Medtronic: 1-800-633-8766
- Boston Scientific: 1-800-227-3422
- St. Jude/Abbot: 1-800-722-3423

Your health care team may have given you this information as part of your care. If so, please use it and call if you have any questions. If this information was not given to you as part of your care, please check with your doctor. This is not medical advice. This is not to be used for diagnosis or treatment of any medical condition. Because each person's health needs are different, you should talk with your doctor or others on your health care team when using this information. If you have an emergency, please call 911. Copyright © 9/2019 University of Wisconsin Hospitals and Clinics Authority. All rights reserved. Produced by the Department of Nursing. HF#8110.