Intermountain® Healthcare

Implantable Cardio Defibrillator (ICD Placement for You or Your Child)

What is an ICD?

An **ICD (implantable cardio defibrillator)** is a small device that corrects your child's heart rhythm. An ICD has a **pulse generator** that is implanted in your child's body, and one or more **leads** (wires) that are threaded into your child's heart.

In an ICD, the leads "listen" to your child's heartbeat and send information to the pulse generator. If there's a problem with your child's heart rhythm, the generator creates an electrical pulse and sends it through the leads to her heart.

Why does my child need it?

A healthy heart pumps at a regular rate, or pace, that adjusts as the body's needs change. This pace is set by your child's own natural pacemaker — a part of her heart that sends electrical pulses to make her heart beat. In your child's case, her heart may be too fast or too slow. Other times, it might go into an irregular rhythm. Your child may be considered at risk for heart rhythm problems if:

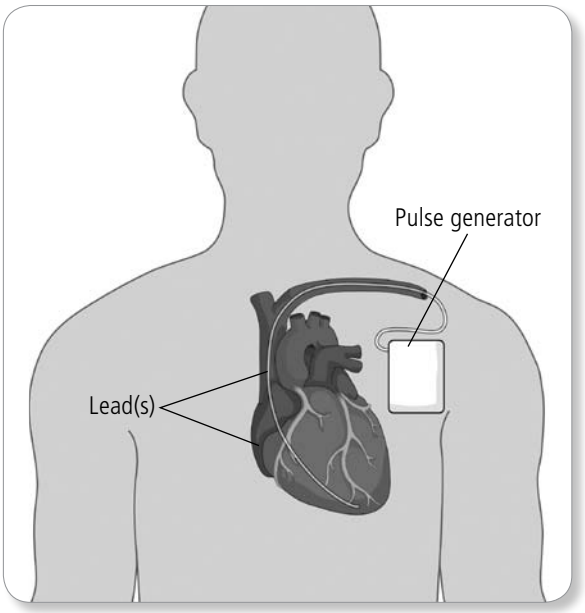
- She has experienced these problems before
- Her heart muscle has been damaged

How does an ICD work?

If your child's heartbeat is too slow, the ICD corrects the problem by helping her heart beat at a regular rate. If her heart begins beating too fast or goes into an irregular rhythm, the ICD sends a shock to "reset" the heart's electrical system.

Once the ICD senses that your child is having a heart rhythm problem, the pulse generator sends a signal to correct it.

NOTE: If you are an adult having this procedure at Primary Children's Medical Center, please substitute "you" for "your child" in the text.



ICD placement involves inserting the pulse generator and threading leads through a vein to the heart.

- **Pacing signals** correct a heartbeat that is a bit too fast or too slow. Your child will probably not notice these signals.
- **Defibrillation** is a strong shock that is sent if your child's heart goes into an unstable rhythm.

The ICD can also **record the electrical activity of your child's heart**, so that the doctor can adjust its settings during follow-up appointments.

Talking with your child's doctor about this procedure

The table lists the most common potential benefits, risks, and alternatives for this procedure. Other benefits and risks may apply in your child's unique medical situation. The conversation you have with your child's healthcare provider is the most important part of learning about these risks and benefits. Don't be afraid to ask questions. It's important to have all your questions answered before you agree to a recommended procedure.

Benefits	Risks and Complications
• Relief of symptoms such as racing heartbeat, dizziness, or fainting • Prevention of heart rhythm problems	• Bleeding or infection where the pulse generator was inserted • Problems related to the anesthetic • Nerve or blood vessel damage • Problems caused by electronic devices

Alternatives
• Before recommending an ICD, your child's doctor will run tests such as an electrocardiogram, Holter monitor, echocardiogram, electrophysiology study, or stress test. • Your doctor may use medication to treat your child's heart rhythm problem before recommending an ICD. • Depending on your child's heart rhythm problem, her doctor may recommend a pacemaker instead of an ICD.

How should we prepare?

There are several things you can do to get ready for the procedure and make it go more smoothly.

- **Arrange for time off work or school.** Your child can return to work or school when the doctor says it's okay, usually after a week or so.
- **Tell your child's doctor about medications and allergies.** Along with prescription medications, include over-the-counter drugs, herbs, and vitamins.
- **Follow the doctor's directions about medications.** Your child may need to stop taking certain blood thinners before the procedure.
- **Arrange for a ride.** You or someone else needs to give your child a ride to and from the hospital.
- **Have your child fast (no food or drink) for 6 to 8 hours before the procedure.** If the procedure is in the morning, your child should not eat or drink anything after midnight the night before.

What happens before?

When your child arrives, here's what will happen:

- You will fill out some paperwork and your child will change into a hospital gown.
- An IV (intravenous) line may be placed in your child's arm or hand. She may also be given medicine by mouth or through a mask before the IV is placed.
- Blood may be drawn for lab tests.
- The left or right side of your child's chest might be shaved, if necesssary, and cleaned.
- Your child will be moved to the cardiac cath lab. The room may feel cool, but your child will be covered with sterile drapes and a blanket.
- Your child will lie on her back. Your child will be given medication through the IV to make her sleep through the procedure.
- Your child's arms may be secured at her sides, because it is important for the arms to be still during the procedure.

What happens during?

This procedure usually takes several hours. Here's what will happen:

1. **Monitoring.** Devices will be attached to keep track of your child's heart rate, blood pressure, and breathing.
2. **Incision.** The doctor will make a small incision (cut) in the skin. This makes a "pocket" for the pulse generator.
3. **Placing one or more leads.** The doctor will insert a needle into a vein, and will insert each lead using the needle. Using X-ray guidance, the leads will be threaded through the vein into your child's heart.
4. **Testing the leads.** The medical team will take electrical measurements to make sure each lead is in the correct place. Each lead might be moved, and retested each time, until it is perfectly positioned.

5 **Attaching the pulse generator.** The pulse generator will be connected to the leads and will be inserted under your child's skin.

6 **Programming the ICD.** The ICD will be programmed to the settings your child's heart needs. The medical team might also adjust other settings.

7 **Closing the incision.** Your child's doctor will close the surgical cut with a few stitches, and your child will be moved to recovery.

What happens after?

- Your child will probably stay in the hospital overnight, so your healthcare team can monitor her heartbeat.
- The next morning your child will have a device check to make sure the leads and generator are working well.
- Your child will get a **device ID card** that identifies the type of ICD she has, when it was placed, and who performed the procedure. Your child will get a permanent card in the mail in a few weeks. Make sure your child has the ID card at all times.
- **Going home:** When your child has recovered adequately from sedation and the procedure, the nurse will send you and your child home with instructions from the cardiologist.

What should I do after we go home?

When you go home, you'll need to take care of your child's incision, report problems, help your child gradually increase her activity, and adjust to a few basic restrictions (see **"Life with an ICD"** at right.

Take care of the incision.

- **Keep the incision clean and dry.** Your child may shower after 48 hours, but cover the incision with plastic so the water doesn't hit it. Don't immerse the incision in water for 10 days or until it heals. Don't scrub the site. Avoid using creams, ointments, or lotions on the site.
- **Wear loose clothing around the site.** You may place a gauze pad over the pulse generator to reduce rubbing on the incision.
- **Expect some soreness** for the first few days and **slight swelling** for about two to four weeks.

Call the doctor about problems.

Call the doctor if your child experiences any of these:

- Redness, swelling, or drainage around the wound
- A wound that separates or isn't healing
- A fever over 101 degrees F.
- Very fast or slow heartbeat
- Swelling in her hands or ankles
- Hiccups that won't go away

Have your child gradually increase activity.

- **Follow the doctor's instructions about keeping your child's arm still for the first few days.** Your child might need to wear a sling for a while. This may help reduce the pain.
- **Check with your child's doctor** about activity during the first 6 to 8 weeks, and about when your child can return to work or school. Ask specifically about:
  - Lifting objects or driving
  - Activities that involve your child raising her arms, such as golfing, bowling, tennis, swimming, or diving
  - Activities that could bump or jar the pulse generator, such as contact sports

Life with an ICD

Along with a better heartbeat, an ICD brings a few other changes to your child's life. Follow these guidelines to help your child's device work safely and effectively.

Let people know

- **Make sure your child has her device ID card at all times.** The ID will give healthcare providers important information in an emergency. It will also be helpful if the pacemaker sets off an alarm.
- **Tell healthcare providers** that your child has an ICD before any procedures that involve needles or incisions (cuts).
- **Tell your child's dentist.** The dentist can avoid using devices that produce electromagnetic fields that can interfere with the device.

Protect the pulse generator

Follow these guidelines:

- **Avoid letting anything hit or rub the device.** Make sure your child is careful about contact sports or other activities that may jar the pulse generator under his skin.
- **Avoid strong electromagnetic fields.** Your child should stay away from:
  - High-intensity power lines or radio towers
  - Magnetic resonance imaging (MRI) equipment
  - Combustion motors — don't let your child lean over the hood of a running car, or touch the spark plug or distributor on a running car or lawn mower
  - Radio transmitters, such CB radios, ham radios, or antennas used to control toys
- **Don't linger around anti-theft detection devices** at store or building entrances. Have your child walk through them at a normal pace.
- Have your child **keep any cell phone or MP3 player 6 inches away** from the pacemaker if it is on.
- **Computers and small household appliances are safe** as long as they are in good working order.
- **Airport screening is safe.** Screening devices may set off an alarm, but they won't harm the device. If your child sets off an alarm, **show your child's device ID.** Ask security not to search your child with the hand-held screening wand, since it contains a magnet.

Monitoring and maintenance

Here's how the ICD will be maintained:

- **Follow-up appointments.** Your child's healthcare provider will ask you to set up follow-up appointments. To check the ICD, your child will have various kinds of tests. For example, an ICD programmer — like a small portable computer — will check the device using a wand placed over the device. The doctor might also adjust the settings of the ICD.
- **Checking the ICD over the phone.** A transmitter might be used at home to send its signals to your doctor.
- **Replacing the battery.** The average battery life is 5 to 10 years. Follow-up appointments will tell your child's healthcare provider if this is needed.
- **Replacing leads.** In rare cases, the leads can become cracked. Your child's healthcare provider will check the leads and replace them if needed.

What should I do if my child gets a shock?

- If the ICD gives your child a **single shock**, have her sit or lie down for a few minutes. **Call your healthcare provider** to report the event.
- If the ICD gives your child **several shocks in a row, call 911.**

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