Intermountain® Healthcare

Implantable Cardioverter Defibrillator (ICD) Placement

What is an ICD?

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

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

An ICD is basically a pacemaker with an added function. While a pacemaker corrects a heartbeat that is too slow, an ICD also corrects a heartbeat that is too fast.

Why do I need it?

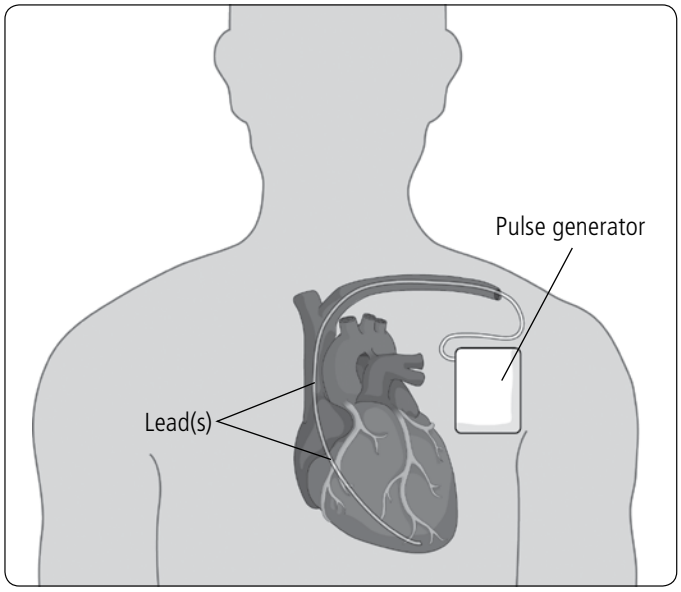
An ICD is used to treat these heart rhythm problems:

- **Ventricular tachycardia.** The ventricles (lower chambers of your heart) send electrical signals too often — and your heart beats too fast.
- **Ventricular fibrillation.** The ventricles send very fast, irregular signals — and your heart starts to quiver. No blood is pumped to the body. If this condition isn't treated right away, it can be fatal.

Ventricular fibrillation is often treated with an **external defibrillator**, using paddles that send an electrical shock through the chest to the heart. However, ventricular fibrillation can come without warning, where an external defibrillator may not be available. An ICD can be a good solution — because it can sense fibrillation right away and deliver an internal shock to correct it.

You may be considered at risk for ventricular heart rhythm problems if:

- You have experienced these problems before
- Your heart muscle has been damaged



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

How does an ICD work?

Once the ICD senses that you're having a heart rhythm problem, the pulse generator sends a signal to correct it.

- **Pacing signals** correct a heartbeat that is a bit too fast or too slow. You will probably not notice these signals.
- **Cardioversion** is a mild shock used if ventricular tachycardia (fast heartbeat) continues even after the pacing signals are sent. This can feel like a sudden thump in the chest that lasts for just a moment.
- **Defibrillation** is a strong shock that is sent if your heart goes into ventricular fibrillation. This sudden shock can feel like being punched in the chest. The shock may be surprising or briefly painful, but it is intended to save your life.

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

Talking with your 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 unique medical situation. The conversation you have with your 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 rhythm problems that can cause sudden cardiac arrest	• Bleeding or infection where the pulse generator was inserted • Problems related to the anesthetic • Nerve or blood vessel damage • Problems caused by electronic devices (see page 4)
Alternatives	
• Before recommending an ICD, your doctor will run tests such as an electrocardiogram, Holter monitor, echocardiogram, electrophysiology study, or stress test. • Your doctor may use medication to treat your heart rhythm problems before recommending an ICD. • Depending on your heart rhythm problem, your doctor may recommend a pacemaker instead of an ICD.	

How do I 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.** You can return to work when your doctor says it's okay, usually after a week or so.
- **Tell your doctor about medications and allergies.** Along with prescription medications, include over-the-counter drugs, herbs, and vitamins.
- **Follow your doctor's directions about medications.** You may be asked to stop taking certain blood thinners before the procedure.
- **Arrange for a ride.** Ask someone to drive you to and from the hospital.
- **Fast for 6 to 8 hours before the procedure.** If the procedure is in the morning, don't eat or drink anything after midnight the night before.

What happens before?

When you arrive, here's what will happen:

- You will fill out some paperwork and change into a hospital gown.
- An IV (intravenous) line will be placed in your arm or hand. You'll be given medication through the IV to make you feel relaxed and drowsy.
- One side of your chest will be shaved, if necessary, and cleaned. (The site for the signal generator is below the collarbone, and is usually on your left side.)
- You'll be moved to the cardiac cath lab. The room may feel cool, but you will be covered with sterile drapes. You can also ask for a blanket.
- You'll lie on your back. Your arms will be secured at your sides, because it is important for your arms to be still during the procedure.

What happens during?

The procedure usually takes one to two hours. You'll be relaxed but awake. Here's what will happen:

1. **Monitoring and local anesthetic.**
   - Devices will be attached to keep track of your heart rate and breathing.
   - The doctor will inject numbing medication in the site where the pulse generator will be inserted. The injection usually feels like a pinprick with some burning, and only lasts a few seconds. After that, your chest will be numb and you should feel no pain.
2. **Incision.** The doctor makes a small incision (cut) in the skin below your collarbone. This makes a small "pocket" for the pulse generator.
3. **Inserting the leads.** The doctor inserts a needle into a vein in your upper chest, and inserts each lead through the needle. Using X-ray "video" guidance, the lead is threaded through the vein into your heart. You won't feel this, since blood vessels don't contain nerves.

4 **Testing the leads.** The medical team takes electrical measurements to make sure each lead is placed correctly. Each lead will be moved and retested until it is in the perfect place.

5 **Attaching the pulse generator.** The pulse generator is connected to the leads and inserted under your skin, into the "pocket" beneath your collarbone.

6 **Programming the ICD.** The medical team then programs the ICD to treat your heart rhythm problem. You'll probably hear them calling numbers to each other as they do this. They might also ask you to take some deep breaths.

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

What happens after?

- You'll probably **stay in the hospital overnight**, so your healthcare team can monitor your heartbeat. The next morning you'll have an x-ray to recheck the position of the leads and the pulse generator.
- You'll get a **temporary device ID card** that identifies the type of ICD you have, when it was placed, and who performed the procedure. Carry this ID card with you at all times.
- You should have a friend or family member drive you home — don't try to drive yourself.

What should I do when I go home?

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

Take care of the incision

After about a week, the stitches will dissolve or your doctor will remove them. Here's how to care for the incision:

- **Keep the incision clean and dry.** Don't bathe for the first week, and cover the site with plastic if you shower. Don't scrub the incision site — clean it with antiseptic as directed by your doctor. If the dressing becomes wet or soiled, remove the dressing and clean the site with antiseptic or soap and water, as directed by your doctor. Avoid using creams, ointments, or lotions on the site.
- **Wear loose clothing around the site.** If you want to wear a bra, place a gauze pad over the pulse generator to reduce rubbing on the stitches.
- **Expect some soreness** for the first few days and **slight swelling** for about two to four weeks.

Gradually increase your activity.

- **Follow your doctor's instructions about keeping your arm still the first few days.** You might need to wear a sling for the first 24 to 48 hours.
- **Ask your doctor about when to resume sexual activity.** You may need to avoid sex for the first week. ICD activity will generally not interfere with sexual activity after the first seven days.
- **Check with your doctor** about activity during the first 6 to 8 weeks. Ask specifically about:
  - Lifting objects or driving
  - Activities that involve raising your arms, such as golfing, bowling, tennis, swimming, or diving
  - Activities that could bump or jar the pacemaker site, such as contact sports, using an air hammer, or firing a rifle
- **Talk to your doctor** about exercises that will gradually increase your range of motion.

When should I call the doctor?

Call your doctor if you experience any of these:

- Redness, swelling, or drainage around the wound
- A fever over 101 degrees F.
- Joint stiffness, pain, or weakness in your arm
- Fainting, or feeling light-headed, or dizzy
- Very fast or slow heartbeat
- Swelling in your hands or ankles
- Constantly feeling tired
- Hiccups that won't go away
- Twitching muscles in your chest or abdomen

Call 911 or go to an emergency room if you receive several ICD shocks in a row, or if you have palpitations, shortness of breath, or chest pain.

Life with an ICD

Along with an improved heartbeat, an ICD brings a few other changes to your life. This section contains some basic guidelines.

Protect the ICD

Follow these tips:

- **Avoid letting anything hit or rub your ICD.** Be careful about contact sports or other activities that may jar the pulse generator under your skin.
- **Be careful with MP3 players and cell phones.** Keep your MP3 player or cell phone at least 12 inches away from the pulse generator. Hold the cell phone against the opposite ear, and don't keep the phone or player in your shirt pocket. If you strap your player onto your arm, use the opposite arm.
- **Don't linger around anti-theft detection devices** at store or building entrances. Walk through them at a normal pace.
- **Avoid strong electromagnetic fields.** Stay away from:
  - Magnetic resonance imaging (MRI) equipment
  - Arc welding equipment, industrial equipment, induction furnaces
  - High-intensity power lines or radio towers
  - Combustion motors — don't 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
- **Computers and small household appliances are safe** as long as they are in good working order and grounded.
- **Airport screening is safe.** Screening devices may set off an alarm, but they won't harm the ICD. If you set off an alarm, show your device ID. Ask them not to search you with the hand-held screening wand, since it contains a magnet.

Let people know

- **Always carry your ID card.** It gives healthcare providers important information in an emergency. It is also helpful if the ICD sets off an alarm.
- **Tell healthcare providers** you have a ICD before treatments that involve needles or incisions (cuts).
- **Tell your dentist.** Your dentist can avoid using devices that produce electromagnetic fields that can interfere with the device.

Monitoring and maintenance

Your healthcare providers will need to check the ICD at times, and might need to replace the batteries or leads.

- **Follow-up appointments.** Your healthcare provider will set up periodic follow-up appointments. To check the ICD, you might have various kinds of tests, including electrocardiograms and battery checks. Your doctor might adjust the ICD settings based on these tests.
- **Checking the ICD over the phone.** A transmitter might be used at home to send ICD signals to wyour doctor.
- **Replacing the battery.** The average battery life is around five years, but may be more or less depending on various factors. Follow-up appointments and other checks will tell your healthcare provider if this is needed.
- **Replacing leads.** In rare cases, the leads can fracture or become cracked. If necessary, your healthcare provider will check the leads and possibly replace them.

What should I do if I get a shock?

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

Patient and Provider Publications 801.442.2963 FS046 - 08/08 *Also available in Spanish.*