

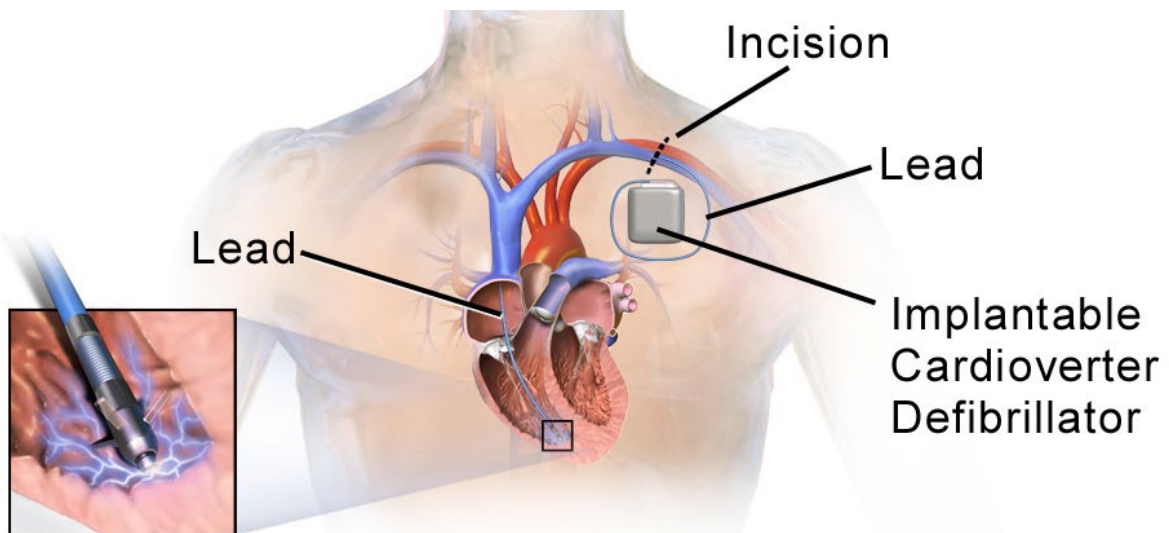
# What is an Implantable Cardioverter-Defibrillator (ICD)?

## What is an ICD?

An Implantable Cardioverter-Defibrillator (ICD) is a small electronic device that helps your heart beat normally and delivers a life-saving shock if needed. It is generally placed under the skin below your collarbone on the left or right side of your chest.

An ICD consists of two parts:

- **The pulse generator-** A small battery-powered unit that sends electrical signals to your heart to help it beat normally.
- **The leads-** The pulse generator is connected to your heart by one or two small leads (insulated wires) which are placed in the lower chambers of your heart. The leads carry the electrical signals from the generator to your heart to adjust your heart rate.



Tip of lead in right ventricle of Heart

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## How does an ICD work?

An ICD monitors your heart rhythm 24 hours a day. It knows when your heartbeat is not normal and tries to return the heartbeat back to normal.

### If your heart is beating too fast or irregularly:

- The ICD first sends small, painless electrical signals to return your heart to a normal rhythm.
- If the fast heart rate is not controlled by the first signals, the defibrillator will deliver a shock to stop the dangerous electrical activity and restore your heart to a normal rhythm.

### If your heart is beating too slow:

- Most ICDs may have a dual function that allows the device to act as a pacemaker. This means the device will send painless electrical signals to your heart if it detects it is beating too slow to help support your heart rate.

## Why is an ICD used?

The main purpose of an ICD is to treat dangerously fast heart rhythms. These heart rhythms are called **ventricular tachycardia** (VT) and **ventricular fibrillation** (VF) and they occur in the lower chambers of the heart (ventricles).

Your doctor may recommend an ICD if you have a history of:

- Ventricular arrhythmias
- Sudden cardiac arrest
- Weakened heart muscle as a result of:
  - Heart attack
  - Viral infections
  - Long standing high blood pressure
  - Toxins (alcohol/drugs)
  - Other autoimmune diseases

- Congenital (inherited) heart conditions such as:
  - Hypertrophic cardiomyopathy
  - Long QT syndrome
  - Brugada syndrome
  - Catecholaminergic polymorphic ventricular tachycardia (CPVT)

## What are the different types of ICDs?

There are multiple kinds of ICDs.

The type you need depends on your specific heart condition and the symptoms you experience.

Your provider will help you decide which type you will receive based on your needs.

- **Single-chamber ICD**

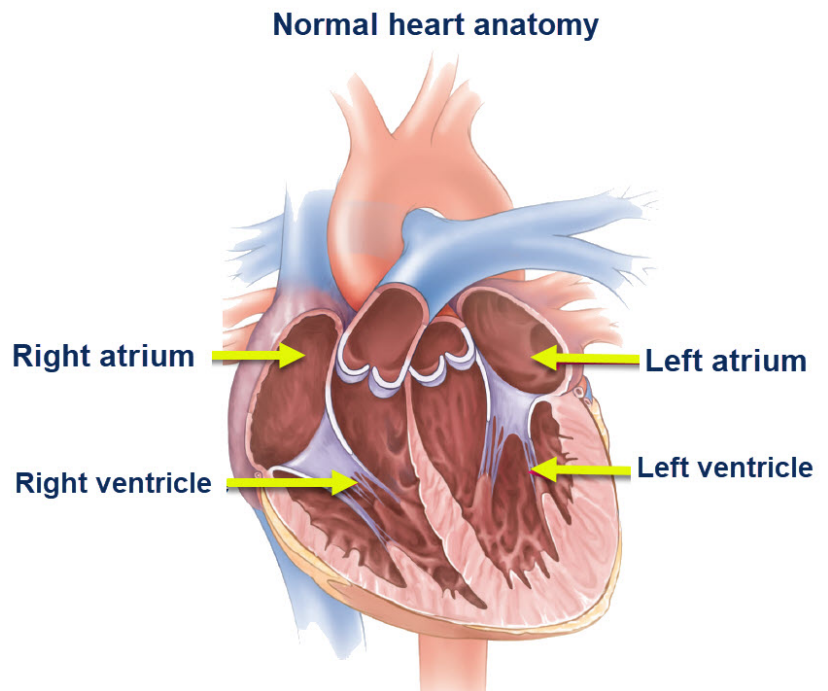
This type of ICD uses a single lead (wire) that is attached to the right ventricle (lower chamber) to deliver energy, if needed.

- **Dual-chamber ICD**

With two leads, this type of ICD connects to both chambers on the right side of your heart, the right atrium (upper chamber) and right ventricle (lower chamber).

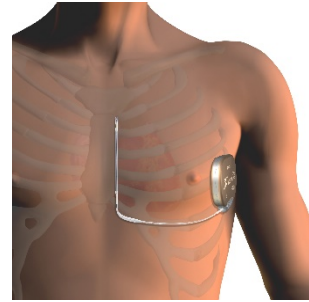
- **Biventricular ICD**

This ICD has 3 leads connected to the right atrium and both ventricles of your heart. It helps the right and left ventricles pump together more normally.



- **Subcutaneous ICD (also called an “SICD”)**

An SICD works by monitoring your heart rhythm through a wire placed just under the skin (subcutaneous) above the heart. It is able to treat fast rhythms by delivering a shock but cannot pace the heart out of a dangerous heart rhythm.



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- **Wearable Cardioverter Defibrillator (WCD or Lifevest®)**

This is a temporary device that is worn outside the body like a vest. It is used to continuously monitor a patient’s heart, detect life-threatening rapid heart rhythms, and automatically deliver a shock to restore a normal heart rhythm. It is often used temporarily while you wait for a permanent ICD to be placed.



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## **What are the risks of having an ICD implanted?**

Complications from having an ICD implanted are uncommon but may include the following:

- Infection at the incision or lead insertion site
- Allergic reaction to the dye or anesthesia used during your procedure
- Swelling, bruising, bleeding or blood clots at the implant site. If you take blood thinners, you are at higher risk for bleeding
- Damage to your blood vessels or nerves near the device
- Puncture of the lung during surgery
- Damage to the heart tissue
- Heart attack
- Stroke
- Death is always a risk of surgery

## Tell your health care provider if:

- You are pregnant or suspect that you may be pregnant
- You are breastfeeding

There may be other risks depending on your specific medical condition. Be sure to discuss any concerns with your provider **before the procedure**.

## How do I find out more information?

Each device company has patient information located on their websites. Here are links to the commonly implanted devices:

- Abbott/St. Jude Medical:  
<https://www.cardiovascular.abbott/us/en/patients/living-with-your-device.html>
- Biotronik: <https://www.biotronik.com/en-us/patients>
- Boston Scientific: <https://www.bostonscientific.com/en-US/patients.html>
- Medtronic: <https://www.medtronic.com/us-en/patients/patient-services.html>

## Additional Resources:

- Heart Rhythm Society (UpBeat)- ICDs: <https://www.upbeat.org/common-treatments/implantable-cardioverter-defibrillator>
- Medtronic- ICD Devices: <https://www.medtronic.com/us-en/patients/treatments-therapies/icd-devices.html>

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Author: Pam Falk RN

Reviewers: Bethany Lee-Lehner RN, MSN, Laura Horwood MS, ACNP-BC

Edited by: Karelyn Munro BA

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