

# Function of Implantable Cardioverter Defibrillator

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## DESCRIPTION

An Implantable Cardioverter Defibrillator (ICD) is a small device that is implanted under the skin of the chest and connected to the heart with leads. It is used to treat life-threatening arrhythmias, including ventricular tachycardia and ventricular fibrillation, which can lead to sudden cardiac death.

## Anatomy and function of an ICD

An ICD is made up of two main components, the pulse generator and the leads.

The pulse generator is a small metal box that contains battery and electronics that monitor the heart's rhythm. It is typically placed under the skin of the chest, near the collarbone. The pulse generator can be programmed to deliver electrical shocks to the heart when it detects a life-threatening arrhythmia.

The leads are thin, flexible wires that are threaded through a vein and attached to the heart. There are usually two leads, one that is placed in the right atrium and one that is placed in the right ventricle. These leads are used to sense the heart's electrical activity and deliver electrical shocks to the heart when necessary. When the ICD detects a life-threatening arrhythmia, it delivers an electrical shock to the heart to restore its normal rhythm. This shock is similar to the shock delivered by external defibrillators used in hospitals and emergency settings.

## Indications for implantation

ICDs are specifically for patients who are at risk of sudden cardiac death due to a history of ventricular tachycardia or ventricular fibrillation. They may also be indicated for patients who have survived sudden cardiac arrest or have certain types of heart disease, such as dilated cardiomyopathy.

The decision to implant an ICD is made on different case basis and is based on a patient's medical history, symptoms, and

overall health status. Patients who are needed to go through ICD implantation will undergo a thorough evaluation, including an electrocardiogram, echocardiogram, and other diagnostic tests.

## Implantation procedure

ICD implantation is typically performed under local anesthesia and sedation. The procedure takes about 1-2 hours to complete and is performed by a cardiologist or electrophysiologist. During the procedure, the pulse generator is placed under the skin of the chest, near the collarbone. The leads are then threaded through a vein and into the heart, using fluoroscopy to guide their placement. Once the leads are in place, they are tested to ensure that they are functioning properly. After the procedure, patients will need to stay in the hospital for monitoring for a short period of time. They will then need to avoid strenuous activity and heavy lifting for several weeks while the incision site heals.

## Complications and risks

As with any medical procedure, there are potential risks and complications associated with ICD implantation, they are

**Infection:** The risk of infection is low, but there is a small risk of infection at the incision site or around the leads.

**Bleeding:** There is a small risk of bleeding during the procedure, which can lead to a hematoma or require blood transfusion.

**Lead dislodgement or fracture:** The leads can become dislodged or fracture, which may require repositioning or replacement.

**Device malfunction:** The ICD can malfunction, which may require reprogramming or replacement.

**Shock-related complications:** The electrical shocks delivered by the ICD can cause discomfort, muscle contractions, and damage to the heart tissue. ICD batteries typically last between 5-10 years, depending on the device and the patient's activity level.

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