

FACT SHEET: Implantable Cardioverter Defibrillators (ICDs)

Implantable cardioverter defibrillators (ICDs) are small devices designed to recognize certain types of abnormal heart rhythms (arrhythmias) and correct them. ICDs continuously monitor the heart rhythm in order to detect overly rapid arrhythmias such as ventricular tachycardia (a rapid, regular heartbeat) and ventricular fibrillation (a rapid, irregular heartbeat). When an abnormal heart rhythm is detected, the ICD corrects the heart rhythm by delivering precisely calibrated and timed electrical shocks to restore a normal heartbeat.

An ICD, smaller than the size of a pager, is implanted under the skin below the collarbone. Each device consists of a battery-powered generator, energy delivery components, and electronic circuitry, which all are sealed in a case. The ICD is connected to the heart with one or more wires. These wires, called leads, are thin, coated wires that travel in the veins between the implant site and the heart. The leads allow the ICD to monitor the heart's rhythm and deliver corrective electrical shocks. Patients describe these defibrillation shocks as somewhat painful or uncomfortable. However, they generally occur rarely and provide a life-saving event for the user.

In addition to monitoring heart rhythms and delivering electrical shocks, ICDs also record the electrical patterns of the heart whenever an abnormal heart beat or arrhythmia occurs. An electrophysiologist (a cardiologist specializing in the electrical function of the heart) can then review the heart's activity after a shock is administered or during regular patient follow-up visits.

The technology of ICDs has advanced greatly in the past decade. ICD therapy is considered effective in fighting cardiac arrest over 90 percent of the time, an astounding success for a condition that few survived as recently as 15 years ago.

Candidates for ICDs are people at risk of sudden cardiac arrest, specifically those with the following:

- Prior cardiac arrest due to Ventricular fibrillation (VF), which is characterized by a heartbeat that is too rapid and chaotic to allow the heart to pump blood. (An exception may be if the VF occurs during a heart attack).
- Ventricular tachycardia (VT) (which is a rapid heartbeat originating from the lower chambers of the heart) which is sustained or causes symptoms.
- Ejection fraction of less than 35 percent. An ejection fraction (EF) is the proportion, or fraction, of blood pumped by the heart with each beat. A normal heart pumps out a little more than half the heart's volume of blood with each beat, making a normal EF 55 percent or higher. A previous heart attack or heart failure can lead to weakened heart and low EF.