

Implantable Devices

Some of the most serious arrhythmias that patients can experience are the rapid and prolonged arrhythmias that come from the pumping chambers. This usually occurs when these chambers have been previously damaged and scarred, such as the aftermath of a heart attack. During these arrhythmias, there is frequently a fall in blood pressure and even unconsciousness. Unless terminated, some can lead to fatal consequences. These arrhythmias require prompt termination which can be most readily accomplished by the administration of an electrical shock passed across the chest. Outside the hospital, this is accomplished by an ambulance team who places paddles on the chest and delivers the shock. This concept is also applied with an implantable device. The premise is that this device, being permanently available to monitor a patient's rhythm, can automatically and in a short period of time, deliver lifesaving electrical energy directly to the heart muscle. Patients who are deemed high risk for the development of these dangerous arrhythmias will often be treated with an implanted device so that they are permanently protected without need for intervention by bystanders or emergency personnel.

These devices are called implantable cardioverter defibrillators (ICD). These are implanted much the way permanent pacemakers are. Using a large vein that passes underneath the collar bone, a wire or lead can be passed intravenously into the right side of the heart. This wire can record the electrical signals from within the heart and tell the device when the heart has gone into a rapid, dangerous arrhythmias. This lead is connected to the device which is then buried under the skin beneath the collar bone. When this device detects a dangerous arrhythmia, it can deliver enough electrical energy through the lead into the heart that the heart will resume its normal electrical activity. The entire process of detection and termination of this potentially fatal arrhythmia can last only a few seconds. Because this period of time is so brief, the patient usually comes to no harm. This device can be highly effective and often life saving in patients who may otherwise succumb to dangerous electrical conditions.