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## **Managing implanted cardiac devices**

Today, more than 2 million U.S. citizens rely on a pacemaker or defibrillator to regulate their heart beat. Implanted cardiac devices are highly reliable and effective in managing heart rhythm problems, such as an irregular heartbeat or when a heart beats too fast or too slow.

### **The power house**

Pacemakers and defibrillators each contain a pulse generator, which houses a battery and a computer chip. The generator, which is placed in a pocket under the collar bone, sends power to the heart via thin flexible wires known as cardiac leads. Implanted pacemakers sense when a heart beat is too slow and send a pulse to shock the heart into its normal rhythm. Defibrillators look similar to a pacemaker; however, a defibrillator is larger in size and is designed to deliver an electrical shock to the heart when the heart rate becomes dangerously fast. This process should occur without any patient recognition.

### **Cardiac leads**

Cardiac leads are thin, insulated wires that connect the pacemaker or defibrillator to the heart and act as the conduit for the electrical signal. Management of implanted leads for pacemakers and defibrillators is a growing concern among physicians and patients as an increasing number receive devices at a relatively young age and patient lifespan continues to increase. Over time, leads may malfunction or become infected — both of which can cause serious complications for patients.

The cumulative risk of infection increases with every pacemaker or defibrillator replacement.

According to the American Heart Association, as many as 20 percent of patients with defibrillators can expect a lead malfunction within 10 years of receiving the device. When malfunction or infection occurs, physicians and patients must consider a variety of treatment options and potential removal of the lead.

## **Removing or abandoning leads**

Following clinical trials proving safe and effective removal techniques, physicians have become increasingly proactive in removing malfunctioning leads during device implantation, upgrades and battery replacement to minimize the amount of hardware abandoned in the body and susceptible to future problems.

Abandoning leads in the body is not always the best option for patients. Patients should be aware of all lead management techniques and speak with their physician if an unlikely problem occurs. Because scar tissue can bind the lead in several places along its length, specialized tools are needed to complete the removal process.

THE HEART HOSPITAL Baylor Plano is using an Excimer Laser procedure, which vaporizes the buildup surrounding leads and frees the wires for easy removal. The excimer or “cool” laser produces pulsed bursts of ultraviolet light energy to gently dissolve binding scar tissue into tiny particles that are easily absorbed into the blood stream. Once the scar tissue is dissolved, the lead can be easily removed. If the patient is suffering from an infection, an antibiotic may also be prescribed to clear up the infection before the new leads are put into place.

It is important for patients to know their options and to speak with their physician about all lead management techniques if a problem occurs.

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