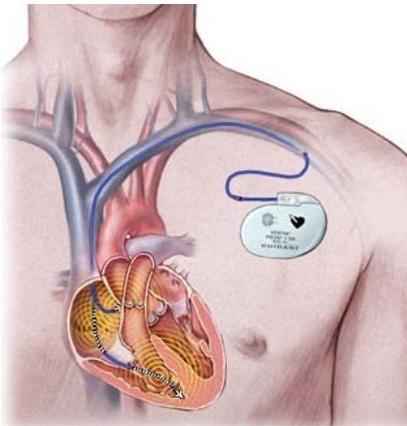


## “Device” Therapy

An artificial pacemaker is a medical device that uses electrical impulses, delivered by electrodes contacting the heart muscles, to regulate the beating of the heart. The primary purpose of a pacemaker is to maintain an adequate heart rate, either because the heart's native pacemaker is not fast enough, or there is a block in the heart's electrical conduction system. A pacemaker is a small electronic device composed of three parts: a generator, one or more leads, and an electrode on each lead. A pacemaker signals the heart to beat when the heartbeat is too slow. If the heart's rate is slower than the programmed limit, an electrical impulse is sent through the lead to the electrode and the pacemaker's electrical impulse causes the heart to beat at a faster rate. When the heart is beating at a rate faster than the programmed limit, the pacemaker will monitor the heart rate, but will not pace, (force a beat). No electrical impulses will be sent to the heart unless the heart's natural rate falls below the pacemaker's low limit.

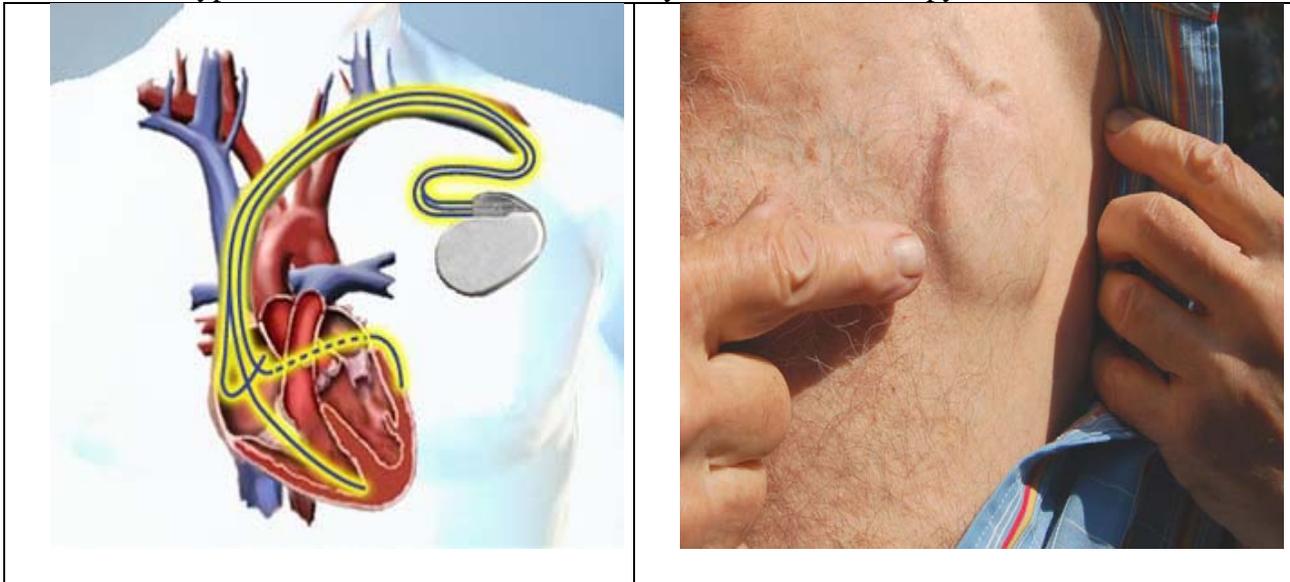


Patient's pacemaker device is “interrogated” about every six months to check function, life of battery, and review underlying heart rhythm.



**Implantable cardioverter defibrillator (ICD):** An implantable cardioverter defibrillator (ICD) looks very similar to a pacemaker, except that it is slightly larger and is designed to deliver an electrical shock to the heart when the heart rate becomes dangerously fast, or “fibrillates.” An ICD senses when the heart is beating too fast and delivers an electrical shock to convert the fast rhythm to a normal rhythm. It is implanted in patients who are at risk of sudden cardiac death such as those with low ejection fraction (squeeze of heart) from previous heart attacks or other etiologies. Patients described the jolt as is a horse kicked their chest. This definitely provides discomfort for a few seconds, but it has literally just saved the person's life.

Heart failure is a complex syndrome that can be characterized by retention of fluid in lungs and lower extremities in patients with a low ejection fraction. It is currently an epidemic in the United States, with over six million people with heart failure and it is the number one reason for hospital readmission with six months after discharge. A new type of pacemaker, called a biventricular pacemaker, is currently used in the treatment of congestive heart failure. Sometimes in heart failure, the two ventricles (lower heart chambers) do not pump together in a normal manner. When this happens, less blood is pumped by the heart. A biventricular pacemaker paces both ventricles at the same time, increasing the amount of blood pumped by the heart. This type of treatment is called cardiac resynchronization therapy.



The heart and overall cardiovascular system is an amazing example of complex physiology. Diagnosing, treating, and preventing cardiovascular disease requires in depth understanding and broad scale utilization of resources by clinicians and patients. Permanent pacemakers, implantable cardiac defibrillators, and cardiac resynchronization therapy devices each have a unique role in cardiovascular disease treatment and prevention strategies. Dr. Surya Rao, with Heart Care Centers of Florida, specializes in the selection of these patients and device implantation and after care