PACEMAKER IMPLANTATION

A pacemaker is a treatment for dangerously slow heart beats. Without treatment, a slow heart beat can lead to weakness, confusion, dizziness, fainting, shortness of breath and death.

Slow heart beats can be the result of metabolic abnormalities or occur as a result of blocked arteries to the heart's conduction system. These conditions can often be treated and a normal heart beat will resume. Slow heart beats can also be a side effect of certain medications in which case discontinuation of the medicine or a reduction in dose may correct the problem.

But sometimes, the conduction system of the heart becomes irreversibly damaged for any one of a number of reasons. And some people require medications that cause slow heart beats as a side effect in order to prevent other serious problems. Since there is no medication that one can take on chronic basis to speed up the heart rate, a pacemaker is the only solution.

Fortunately, having a pacemaker implanted is only a minor surgical procedure. This is not open heart surgery. After a pacemaker is implanted, most people resume their previous lifestyle with little or no limitations.

The procedure is performed with mild sedation and a local anesthetic. Patients are not put to sleep. An 2 inch incision is made parallel to and just below a collar bone. Pacer wires are then inserted into a vein that lies just under the collarbone and advanced through that vein under fluoroscopic guidance into the heart. The other end of the pacer wires are connected to a "generator" that is implanted under the skin beneath the collar bone. This generator is about half an inch deep and one and a half inches wide. The skin is then sutured closed and the patient leaves the hospital later than same day or the following day. Incisional pain is mild and transient and usually responds to Tylenol. It is possible to feel the pacer generator under the skin and a slight deformity of the skin can be visually noticed.

Patients may not shower for a week after the procedure to keep the incision dry and should avoid excessively exerting the arm on the side the pacer was placed for that week.

After a week, the patient may resume their prior lifestyle without limitation. Household appliances do not interfere with modern day pacemakers. However, cellular phones may-especially digital cell phones. These should be kept 12 inches away from the pacemaker when on-preferably at the ear on the opposite side of the pacemaker. Never leave the cell phone in a pocket overlying the pacemaker.

Patients with pacemakers should avoid powerful electromagnetic fields which may reprogram the pacemaker. MRI (magnetic resonance imaging) scans cannot be performed on patients with pacemakers for that reason.

The pacemaker generator contains a lithium battery and what is, essentially, a little computer. The generator can communicate with an external device placed on the skin overlying the pacemaker. Through this device, a physician can change the programming of the pacemaker to best suit the individual patient's needs and

investigate the status of the pacemaker. Some pacemakers also report on the performance of the patient's heart.

Pacemakers can also be checked over the telephone. The patient places a device and a magnet over the pacemaker and the pacemaker transmits a signal over phone line that is analyzed in the physicians office.

Pacemaker batteries give off warning signals when they are running low on power many months before they actually fail. This can be detected either by a telephone check or by a formal interrogation by the external device mentioned above. Pacemakers are generally checked at least every 3 months to allow plenty of time to change the generator when it is running low on power. Changing the generator simply means remaking the same incision, removing the old generator, and plugging the existing wires into the new generator. The patient goes home the same day. Most batteries last at least 5 years.

Pacemakers sense every heart beat the patient has and only pace the heart when the patient's heart rate falls below a predetermined limit. Patients are usually completely unaware of when the pacer is pacing their heart. In some patients, the pacemaker only needs to fire very rarely because the slow heart beat only occurs intermittently. In other patients, the heart beat is always too slow and the pacemaker has to pace the heart all of the time. Such patients are said to be pacemaker dependent.

Another use of pacemakers is for a disease called hypertrophic obstructive cardiomyopathy. This is a disease where overgrown heart muscle blocks the egress of blood out of the heart. By altering the electrical activation pattern of the heart's muscle, pacemakers can help alleviate this problem.

A special type of pacemaker that stimulates both the left and right ventricles of the heart simultaneously (a biventricular pacemaker) can reduces symptoms and the need to be rehospitalized in heart failure patients with weak heart muscle who demonstrate slow electrical conduction through the ventricles on their ECG. This is known as cardiac resynchronization therapy.