Hamilton Cardiology Associates | Electrophysiology Department

IMPLANTABLE PACEMAKER

Your cardiologist is requesting for you to be scheduled for pacemaker insertion. One of our hospital procedure coordinators will be contacting you within the next 48 hours to interview and schedule a procedure date for you. Please have this packet available for your phone call as they will also review the attached instructions with you at that time and answer any questions you may have. Should you need to contact our scheduling department, please call the main number, 609-584-1212 and ask to speak with the procedure scheduling department.

***The hospital will contact you directly to schedule your pre-testing appointment.**

PRE-TESTING:
DATE:_____ TIME:_____

PROCEDURE LOCATION: SFMC RWJ- Hamilton CHS – Hopewell PMC
RWJ-New Brunswick (Dr. Wjasow only)

PERFORMING: Dr. Caplan Dr. Wjasow Dr. Sanyal
DATE: _____

FOLLOW UP APPT: at the Madison Office
Dr. Caplan Dr. Wjasow Dr. Sanyal
Date: _____ Time:_____

PERMANENT PACEMAKER INSERTION (PPM)

What is an artificial pacemaker?

A PPM is a small battery-operated device that helps the heart beat in a regular rhythm. There are two types of pacemakers, the traditional pacemaker which has two parts: a generator and wires (leads). The generator is a small battery-powered unit. It produces the electrical impulses that stimulate your heart to beat. The generator may be implanted under your skin through a small incision. The generator is connected to your heart through tiny wires that are implanted at the same time. The impulses flow

through these leads to your heart and are timed to flow at regular intervals just as impulses from your heart's natural pacemaker would. Some pacemakers are external and temporary, not surgically implanted.

The second type of Pacemaker is the Micra Leadless Pacemaker. A Micra Pacemaker is a small implanted device that sends electrical impulses to the heart when it senses that the heartbeat is too slow. Unlike a traditional pacemaker that is inserted in the chest wall, the Micra is a much smaller device that is implanted directly into the heart through a vein in your groin. With this, there is no chest incision, scar, or bump that a traditional pacemaker leaves.

Why do I need one?

Your doctor may recommend a pacemaker to make your heart beat more regularly if:

- Your heartbeat is too slow and often irregular.
- Your heartbeat is sometimes normal and sometimes too slow.

How is a Pacemaker implanted?

A traditional pacemaker is implanted in a pouch under the skin of the chest or abdomen, often just below the collarbone. The generator is about the size of a pocket watch. Wires or leads run from the pulse generator to positions on the surface of or inside the heart and can be installed through blood vessels, eliminating the need for open-chest surgery. Newer devices are entirely placed below the skin without wires inside the blood vessels.

A Micra Leadless Pacemaker is inserted by a straw-like catheter system into a vein, typically near the upper thigh area of your leg. The catheter system moves the Micra into the right ventricle of the heart (bottom chamber). The Micra pacing capsule is then placed against the heart wall and secured. Your doctor will test the Micra to verify that it is working properly, and then the catheter system is then removed.

How does it work?

A PPM replaces the heart's defective natural pacemaker functions. The sinoatrial (SA) node or sinus node is the heart's natural pacemaker. It's a small mass of specialized cells in the top of the right atrium (upper chamber of the heart). It produces the electrical impulses that cause your heart to beat. A chamber of the heart contracts when an

electrical impulse or signal moves across it. For the heart to beat properly, the signal must travel down a specific path to reach the ventricles (the heart's lower chambers). When the natural pacemaker is defective, the heartbeat may be too fast, too slow or irregular. Rhythm problems also can occur because of a blockage of your heart's electrical pathways. The artificial pacemaker's pulse generator sends electrical impulses to the heart to help it pump properly. An electrode is placed next to the heart wall and small electrical charges travel through the wire to the heart. Most pacemakers have a sensing mode that inhibits the pacemaker from sending impulses when the heartbeat is above a certain level. It allows the pacemaker to fire when the heartbeat is too slow. These are called demand pacemakers.

The device will work automatically on its own 24hours a day. Our Heart Rhythm Specialists supervise our team of qualified cardiac technicians to make sure your device is working properly and optimally. The technicians check for abnormal readings sent from home on a daily basis during regular business hours and they will also check your device in the office, at our device clinic. These findings are reviewed with our Heart Rhythm Specialists in order to determine if any intervention is needed.

Device Clinic & Remote Monitoring

You will either be discharged from the hospital with your remote box or one will be sent to your home. It is important to set up your remote box once you receive it. All remote monitors are accompanied with easy assembly directions. If you have difficulties or any questions regarding the set up and use of your remote box you may contact our office or the company where your device is from.

Depending on your clinical status, your device will be checked remotely every 91 days or every 31 days. You will have an appointment scheduled for each visit but most of these appointments will not require any action by you. Of course you will always have the option of sending in remote readings if you should experience any symptoms. We have a team of qualified cardiac technicians to make sure your device is working properly and optimally. The technicians check for abnormal readings sent from your remote on a daily basis, in addition to your regular scheduled remote checks, during regular business hours. These findings are then reviewed with our Heart Rhythm Specialists in order to determine if any intervention is needed.

Although your device is being monitored by our staff and physicians, it is important to remember that your device is not being monitored continuously, around the clock. Therefore it is important to remember that device monitoring does not replace your office visit with your doctor, nor should you assume we would know if you are feeling

unwell or are experiencing any symptoms at home. Please continue to call the office and report any symptoms or changes in your clinical condition just as you would if you did not have a device.

Also, please note, if your insurance requires referrals or co-pays for testing they will be required for your regular scheduled remote monitoring as well.

American Heart Association (AHA) Recommendation

If you have an artificial pacemaker, be aware of your surroundings and the devices that may interfere with pulse generators:

Home appliances

CB radios, electric drills, electric blankets, electric shavers, hand radios, heating pads, metal detectors, microwave ovens, TV transmitters and remote control TV changers, in general, have not been shown to damage pacemaker pulse generators, change pacing rates or totally inhibit pacemaker output.
Several of these devices have a remote potential to cause interference by occasionally inhibiting a single beat. However, most people can continue to use these devices without significant worry about damage or interference with their pacemakers.
Power-generating equipment, arc welding equipment and powerful magnets (as in medical devices, heavy equipment or motors) can inhibit pulse generators. Patients who work with or near such equipment should know that their pacemakers may not work properly in those conditions, and may be prohibited from doing so after their procedure.

Cell Phones

Cell phones available in the United States (less than 3 watts) don't seem to damage pulse generators or affect how the pacemaker works.
Technology is rapidly changing as the Federal Communications Commission (FCC) is making new frequencies available. Newer cell phones using these new frequencies might make pacemakers less reliable. A group of cell phone companies is studying that possibility.

Medical Equipment

Carry a wallet Pacemaker ID card with you. Equipment used by doctors and dentists can affect your pacemaker, so tell them you have one.

Magnetic Resonance imaging (MRI) uses a powerful magnet to produce images of internal organs and functions. Metal objects are attracted to the magnet and are normally not allowed near MRI machines. The magnet can interrupt the pacing and inhibit the output of pacemakers. If MRI must be done, the pacemaker output in some models can be reprogrammed. Newer pacemakers are now MRI compatible, but the MRI must be performed at a center that is certified in treating patients with pacemakers. Discuss with your doctor the possible risks and benefits before you undergo MRI scanning.

Extracorporeal shock-wave lithotripsy (ESWL) is a noninvasive treatment that uses hydraulic shocks to dissolve kidney stones. This procedure is safe for most pacemaker patients, with some reprogramming of the pacing. You'll need careful follow-up after the procedure and for several months to be sure your unit is working properly. Patients with certain kinds of pacemakers implanted in the abdomen should avoid ESWL. Discuss your specific case with your doctor before and after the treatment.

Radiofrequency (RF) ablation uses radio waves to manage a wide variety of arrhythmias. Recent studies of patients with implanted pacing systems measured the units before, during and after RF catheter ablation. They showed that most permanent pacemakers aren't adversely affected by radio frequencies during catheter ablation. A variety of changes in your pacemaker can occur during and after the treatment. Your doctor should carefully evaluate your pacing system after the procedure.

Transcutaneous electrical nerve stimulation (TENS) is used to relieve acute or chronic pain. Several electrodes are placed on the skin and connected to a pulse generator. Most studies have shown that TENS rarely inhibits bipolar pacing. It may sometimes briefly inhibit unipolar pacing. This can be treated by reprogramming the pulse generator.

Diagnostic radiation (such as screening X-ray) appears to have no effect on pacemaker pulse generators. However, therapeutic radiation (such as for treating cancerous tumors) may damage the pacemaker's circuits. The degree of damage is unpredictable and may vary with different systems. But the risk is significant and builds up as the radiation dose increases. The American Heart Association recommends that the pacemaker be shielded as much as possible, and moved if it lies directly in the radiation

field. If you depend on your pacemaker for normal heart pacing, the electrocardiogram (ECG) should be monitored during the treatment, and your pulse generator should be tested often after and between radiation sessions.

Dental equipment doesn't appear to affect pacemakers adversely. Some patients may feel an increase in pacing rates during dental drilling.
Electroconvulsive therapy (such as for certain mental disorders) appears to be safely used in patients with pacemakers.

Short-wave or microwave diathermy uses high-frequency, high-intensity signals. These may bypass your pacemaker's noise protection and interfere with or permanently damage the pulse generator.

Pre-Admission Testing

- The hospital will call you to schedule your pre-admission testing appointment
- During this appointment, you will be interviewed by a nurse, who will review your medical history and medications
- Bring all medication bottles in a zip lock bag, or a detailed list of your medications including dosage and frequency
- Fasting bloodwork, EKG, and CXR may be performed at this appointment.
- Take all medications as prescribed
- HCA will contact your insurance for pre-authorization. If a referral is required, we will fax a referral request to your primary care physician with all the necessary information.

Before The Procedure

- No solid food or drink after midnight including gum or candy.
- You may take your usual medications with a sip of water the morning of the procedure, except diabetic medications
- Diabetic patients: Do not take diabetic medications or Insulin the morning of your procedure
- Coumadin /Eliquis/Xarelto/Savaysa/Pradaxa patients: You may have been given a stop date, if not or have questions regarding medication instructions please call the office.
- If you develop symptoms of a cold, flu or fever or if you have been exposed to any communicable diseases (chicken pox, shingles, mumps, measles or tuberculosis) since your preadmission visit, immediately notify us.

- The hospital will call you the afternoon prior to your appointment to let you know the arrival time.
- Be prepared to stay at least one night in the hospital.

Discharge Instructions

Traditional Pacemaker

- Do not lift your arm above your shoulder for 2 weeks. We have provided an arm sling to help remind you of this limitation for a few days. Please remove the sling and exercise your elbow frequently**.**
- Do not lift anything heavier than 5 pounds for 2 weeks.
- Do not drive for 2 weeks.
- Avoid sexual activity and /or vigorous exercise for 2 weeks.
- Walk and climb stairs without limitation as long as you feel able to do so.

All of the above mentioned limitations are recommended because the wires that the doctor has inserted require time to become permanently imbedded in the tissues of your heart. Certain activities involving lifting and movement can easily dislodge the placement of these wires, requiring additional surgery to repair.

Leadless Pacemaker

- Do not lift over 10 pounds for the first 3 days at home
- You may resume 24 hours after discharge, unless advised otherwise
- You may resume walking at home. After 24 hours, you may walk the distance at which you are accustomed. If you have not been walking, you may start at a low level.

Wound Care

- Upon leaving the hospital, there may be a transparent dressing over the site. Leave this dressing in place until your follow-up visit. The doctor may have used dermatologic “glue” to assist in the closure of the incision. In this case, there would be no dressing. Others have a “pressure” dressing. This is a larger dressing that will need to be removed daily so that the site can be checked. We will arrange for a visiting nurse to come to your house on the first day after discharge to provide further instructions.

- You may shower as usual. Allow the water to run over the transparent dressing. *Please do not rub the area.* The dressing should remain intact until it is removed at the follow-up appointment. Please remove the dressing only in the following situations: moisture invades the dressing or there is a foul smell over the area. If you have a "pressure" dressing, you may shower when it is removed daily and reapply thereafter.
- Please notify the office for any of the following symptoms:
- Bleeding, swelling, purulent discharge, or redness at the incision site
- Fever greater than 100.5, or chills
- Dizziness or lightheadedness

Follow UP

- You should been given a follow up appointment date for an incision check within 7-10 days after discharge, if not please call the office 609-584-1212
- Maintain you regular appointment with your primary cardiologist
- Read the instruction manual that accompanies the device.

Medications

- You may have been given a prescription for an antibiotic to prevent infection, please use as directed
- Thank you for allowing Hamilton Cardiology to participate in your care. Your cardiovascular health is out priority. Please contact the office for any further questions or concerns.

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