

# ELECTROMAGNETIC INTERFERENCE (EMI) IN THE HOME OR MEDICAL ENVIRONMENT

It is important to be aware of medical procedures and common items that may create electromagnetic interference (EMI) with your device.

Items that give off electromagnetic signals may cause your device to mistake those impulses for the signals coming from your heart. A pacemaker may respond by delaying its pacing. An ICD may respond by delivering a shock that you don't need or not providing a shock that is needed.

EMI is generally temporary and dependent on how close you are to the item giving off the signals.

Refer to this list for general items to avoid. Contact your doctor if you have any questions about how a specific type of equipment will interact with your device.

MEDICAL PROCEDURES		
<b>Not Recommended:</b>		
<ul style="list-style-type: none"> <li>▪ MRI/MRA scans*</li> <li>▪ Microwave diathermy</li> </ul>		
<b>Check with your doctor before undergoing the following procedures:</b>		
<ul style="list-style-type: none"> <li>▪ Acupuncture with electrical stimulus</li> <li>▪ Cardioversion</li> <li>▪ Electrocautery</li> <li>▪ Electroconvulsive therapy</li> <li>▪ Electrolysis</li> <li>▪ Endoscopic procedures: colonoscopy/gastrosocopy</li> </ul>	<ul style="list-style-type: none"> <li>▪ Hyperbaric therapy</li> <li>▪ Iontophoresis</li> <li>▪ Interferential current therapy</li> <li>▪ Laser/Lasik eye surgery</li> <li>▪ Lithotripsy</li> <li>▪ Radiation therapy</li> <li>▪ Radio frequency ablation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Therapeutic ultrasound</li> <li>▪ Transcutaneous Electrical Nerve Stimulation (TENS)</li> <li>▪ Transurethral prostate therapy</li> </ul>
<b>No Known Risk:</b>		
<ul style="list-style-type: none"> <li>▪ Acupuncture with no electrical stimulus</li> <li>▪ Bone density scan</li> <li>▪ CT Scan</li> </ul>	<ul style="list-style-type: none"> <li>▪ Dental drills and ultrasonic scalers</li> <li>▪ Diagnostic X-ray</li> <li>▪ Electrocardiogram</li> </ul>	

SECURITY/ANTITHEFT SYSTEMS (Airports, Retail Stores)
<b>No Known Risk, but follow precautions as noted:</b>
<ul style="list-style-type: none"> <li>▪ Inform airport security personnel you have an implanted device and show Medical Device ID card.</li> <li>▪ Metal detectors and Electronic Article Surveillance systems are generally safe, but do not linger when you pass through them.</li> <li>▪ If the alarm sounds (it may not), it only means that the system detected the metal in your device.</li> <li>▪ Security personnel may use a handheld wand. If so, it is important that you ask them to perform the search quickly and to avoid holding the wand over your implanted device for a prolonged period of time.</li> </ul>

\* Some newer pacemakers are called MRI (or MR) conditional. This means that they are designed to allow you to safely undergo an MRI scan under set conditions, due to safeguards in the system's design that protect it from the risks a non-MRI conditional system might face. You should have been advised and given a special identification card if you have an MRI conditional pacemaker system.

## PERSONAL AND OFFICE TECHNOLOGY

### Not Recommended:

- Magnetic mattresses or chairs
- Electrical equipment that is in poor condition or improperly grounded

### No Known Risk, but follow precautions as noted:

- |                             |                                    |  |
|-----------------------------|------------------------------------|--|
| ▪ AM/FM radios              | ▪ Electric razors*                 | ▪ Laptop/desktop computers   |
| ▪ Bingo game magnetic wands | ▪ Electric invisible fences        | ▪ Personal digital assistants                                      |
| ▪ CB and ham radios         | ▪ Fax machines                     | ▪ Printers   |
| ▪ CD/DVD players            | ▪ Global positioning systems (GPS) | ▪ Remote controls: TV, garage door, stereo, camera/video equipment |
| ▪ Cell phones*              | ▪ Hair dryers*                     | ▪ Scuba diving (up to 200 feet)                                    |
| ▪ Copy machines             | ▪ Heart rate monitors              | ▪ Slot machines  |
| ▪ Cordless phones*          | ▪ Heating pads                     | ▪ Stereo speakers*   |
| ▪ Handheld massagers*       | ▪ iPods and MP3 players            | ▪ Tanning beds   |
| ▪ Hearing aids              | ▪ Laser tag games                  | ▪ TVs and VCRs   |
| ▪ Electric blankets         | ▪ Pagers                           | ▪ Video games  |
| ▪ Electric toothbrushes     | ▪ Patient alert devices            |  |

\* Do not place directly over device

## HOUSEHOLD ITEMS

### Not Recommended:

- Electrical appliances that are in poor condition or improperly grounded

### No Known Risk, but follow precautions as noted:

- |  |                             |                          |
|--|-----------------------------|--------------------------|
| ▪ Air purifiers                        | ▪ Electric knives           | ▪ Leaf blowers           |
| ▪ Battery-powered cordless power tools | ▪ Electric ovens and stoves | ▪ Microwave ovens        |
| ▪ Blenders                             | ▪ Food processors           | ▪ Portable space heaters |
| ▪ Clothes dryers                       | ▪ Gas ovens and stoves      | ▪ Snow blowers           |
| ▪ Convection ovens                     | ▪ Gas-powered tools*        | ▪ Soldering irons        |
| ▪ Corded drills and power tools*       | ▪ Hot tubs/whirlpool baths  | ▪ Stud finders           |
| ▪ Electric can openers                 | ▪ Lawn mowers*              | ▪ Vacuum cleaners        |
|  | ▪ Laser level               | ▪ Washing machines       |

\* Keep 12 inches from device

## INDUSTRIAL EQUIPMENT

A variety of industrial equipment produce EMI of sufficient field strength and modulation characteristics to interfere with proper operation of the pulse generator. These include, but are not limited to: arc welders; induction furnaces; very large or defective electric motors; and internal combustion engines with poorly shielded ignition systems.

