

When you have a heart device – like a pacemaker or an implantable defibrillator – it's only natural that you'll have some questions about what kinds of items could potentially affect its operation.

This is why we've put together this simple guide – to answer your questions and help you feel more at ease as you live your life with a Medtronic implantable heart device.

### **What you should know about Electromagnetic Compatibility (EMC)**

First of all, Medtronic heart devices are built with protective shields, so the majority of items that you use or come into contact with will not affect the normal operation of your pacemaker or implantable defibrillator. However, items that generate, transmit or use electricity – such as a portable generator, cell phone or a power drill – have electromagnetic fields around them. Some of these fields might affect the normal operation of your heart device. It is this

relationship between these electromagnetic fields and your heart device that is called Electromagnetic Compatibility.

### **How items may affect your heart device**

If the electromagnetic fields surrounding an item are too close to your pacemaker or implantable defibrillator – and your heart device happens to detect these fields – this could temporarily affect the normal function of your heart device. This same effect could occur if the item being touched is not in good working order or properly wired, causing electrical current to flow into your body. In either situation, this may temporarily cause your heart device to deliver a therapy that is not needed or withhold a therapy that is needed. This is why we recommend you only use items that are in good working condition and you maintain a minimum distance between certain items and your implanted heart device. This will help to avoid any temporary effect on your pacemaker or implantable defibrillator.

### **What to do if you think an item is affecting your heart device**

If you feel dizzy, feel rapid or irregular heartbeats, or receive a shock while using an item, then release whatever you're touching or move away from it. Any temporary effect is unlikely to cause reprogramming or damage to your pacemaker or implantable defibrillator – your heart device should return to its normal operation. Of course, if your symptoms continue or do not improve, contact your doctor as soon as possible.

### **Answers to the most commonly asked questions**

We've organized this guide to make it helpful and convenient for you to find the answers you're looking for. It's divided into four main categories:

1. Household Items/Hobby
2. Telecommunications and Office Equipment
3. Tools/Industrial Equipment
4. Medical/Dental Procedures

Each category is broken into sections, ranging from no known risk to special considerations, which provides you with the recommended minimum distance for the items or products listed. If the item you're looking for isn't on the list or you have a specific question about an item, contact Medtronic Patient Services at 1 (800) 551-5544, extension 41835, between 7:00 am and 6:00 pm Central Time, Monday-Friday.

We hope this guide makes it easier to find answers to your questions about items in your everyday environment.

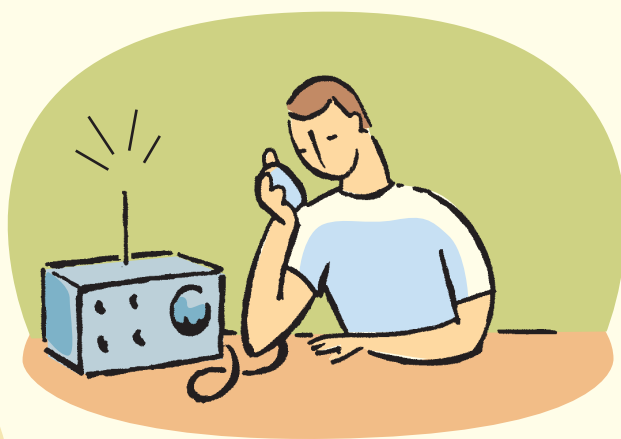


## Household Items/Hobby

Most household and hobby items are unlikely to affect your heart device when the items are in good working condition, used as intended, and the recommended distances are maintained. For items that transmit power through an antenna, it is recommended that you follow the noted distances between the antenna and your implanted heart device.

No Known Risk	Minimal Risk	Special Considerations
<p><b>If the item is used as intended and in good working condition there is no known risk:</b></p> <ul style="list-style-type: none"> <li>• Battery Charger – for household batteries</li> <li>• Casino Slot Machine</li> <li>• CD/DVD/VHS Player or Recorder</li> <li>• Dishwasher</li> <li>• Electric Blanket</li> <li>• Electric Guitar</li> <li>• Garage Door Opener</li> <li>• Heating Pad</li> <li>• Hot Tub</li> <li>• Ionized Air Filter</li> <li>• Iron</li> <li>• Kitchen Appliances – small and large (blender, can opener, refrigerator, stove, toaster)</li> <li>• Massage Chair/Pad</li> <li>• Medical Alert Necklace</li> <li>• Microwave Oven</li> <li>• Radio/iPod®</li> <li>• Remote Control (CD, DVD Player, TV, VHS)</li> <li>• Salon Hair Dryer</li> <li>• Shaver – battery powered</li> <li>• Tanning Bed</li> <li>• TV</li> </ul>	<p><b>Maintain at least a 6-inch distance between the item and your heart device:</b></p> <ul style="list-style-type: none"> <li>• Cordless Headphone Sending Unit (TV/Stereo)</li> <li>• Cordless Telephone – from antenna and charging base</li> <li>• Electric Grocery Cart/Golf Cart – from motor</li> <li>• Electric Kitchen Appliances – hand-held (electric mixer or knife)</li> <li>• Electric Shaver – corded</li> <li>• Electric Toothbrush Charging Base</li> <li>• Hair Dryer – hand-held</li> <li>• Home Wireless Electronics – from antenna</li> <li>• Magnetic Therapy Products</li> <li>• Radio-controlled Items – from antenna</li> <li>• Sewing Machine/Serger – from motor</li> <li>• Small Magnet (household magnet)</li> <li>• Speakers</li> <li>• Treadmill – from motor</li> <li>• Vacuum Cleaner – from motor</li> </ul>	<p><b>Maintain at least the recommended distance between the item and your heart device:</b></p> <p><b>12-Inch Distance</b></p> <ul style="list-style-type: none"> <li>• Car/Motorcycle – from components of ignition system</li> <li>• Electric Fence</li> <li>• Electric Pet Containment Fence – from buried wire and indoor antenna</li> <li>• Transformer Box (green box in yard)</li> </ul> <p><b>2-Foot Distance</b></p> <ul style="list-style-type: none"> <li>• Beach Comber Metal Detector – from search head</li> <li>• Induction Cooktop Stove</li> </ul> <p><b>NOT RECOMMENDED</b></p> <ul style="list-style-type: none"> <li>• Ab Stimulator</li> <li>• Electric Body Fat Scale</li> <li>• Magnetic Mattress Pad/Pillow</li> </ul>

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## Telecommunications and Office Equipment

Guidelines for safe operation of telecommunications and office equipment include such factors as transmitting power, frequency, and antenna type. For items that transmit power through an antenna, it is recommended that you follow the noted distances between the antenna and your implanted heart device.

No Known Risk	Minimal Risk	Special Considerations
<p><b>If the item is used as intended and in good working condition there is no known risk:</b></p> <ul style="list-style-type: none"> <li>• Copy Machine</li> <li>• Desktop/Laptop Computer</li> <li>• Fax Machine</li> <li>• Global Positioning System (GPS)</li> <li>• Low Voltage Residential Power Lines</li> <li>• Metal Detectors Archway – when walking through normally (airports, buildings, schools)</li> <li>• Pager – receiver only</li> <li>• Printer</li> <li>• Scanner</li> <li>• Theft Detection Systems – when walking through normally (libraries, stores)</li> </ul>	<p><b>Maintain at least a 6-inch distance between the item and your heart device:</b></p> <ul style="list-style-type: none"> <li>• Airport Screening Wand</li> <li>• Amateur Radios, Ham Radios, Marine Radios, Walkie Talkies – 3 watts or less – from antenna</li> <li>• Cellular Phone – 3 watts or less – from antenna</li> <li>• OnStar™ Technology – from antenna</li> <li>• Security Badge Wall Scanner</li> <li>• Wireless Communication Items (computer, headsets, modem, Palm® Pilot, router)</li> </ul>	<p><b>Maintain at least the recommended distance between the item and your heart device:</b></p> <p><b>12-Inch Distance</b></p> <ul style="list-style-type: none"> <li>• Amateur Radio, Ham Radio, Marine Radio, Walkie Talkie – between 3-15 watts – from antenna</li> <li>• Citizens Band (CB) Radio – 5 watts or less – from antenna</li> </ul> <p><b>2-Foot Distance</b></p> <ul style="list-style-type: none"> <li>• Amateur Radio, Ham Radio, Marine Radio, Walkie Talkie – between 15-30 watts – from antenna</li> </ul>

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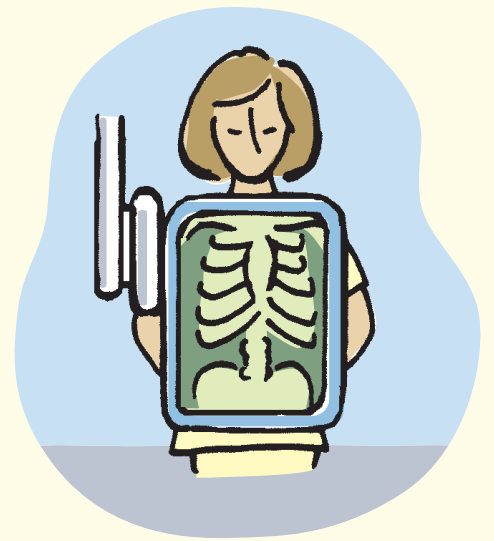
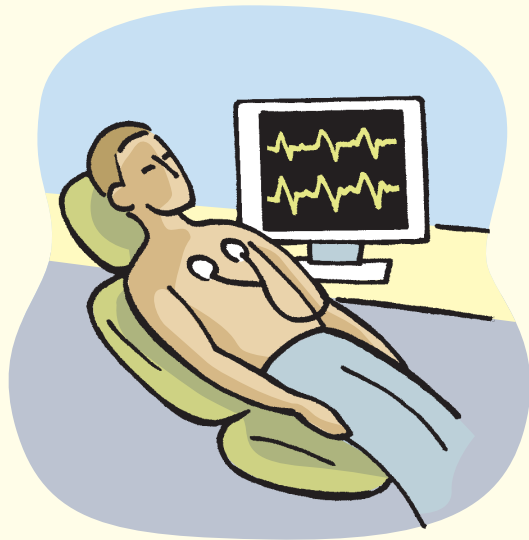


## Tools/Industrial Equipment

It is important that your power tools and/or equipment be in good working order and properly wired (three-prong plug, if applicable) and used as intended by the manufacturer of the product. It is recommended that corded electrical items be plugged into a safety outlet device called a ground fault circuit interrupter (GFCI or GFI).

No Known Risk	Minimal Risk	Special Considerations
<p>If the item is used as intended and in good working condition there is no known risk:</p> <ul style="list-style-type: none"> <li>• Calipers – battery powered</li> <li>• Flashlight – battery powered</li> <li>• Laser Level</li> <li>• Soldering Iron</li> <li>• Stud Finder</li> </ul>	<p>Maintain at least a 6-inch distance between the item and your heart device:</p> <ul style="list-style-type: none"> <li>• Circular Saw – skill saw</li> <li>• Drills – battery and electric powered</li> <li>• Grinder (hand-held)</li> <li>• Hedge Trimmer – electric powered</li> <li>• Lawn Mower – electric powered</li> <li>• Leaf Blower – electric powered</li> <li>• Reciprocating Saw (Sawzall®)</li> <li>• Router</li> <li>• Sander</li> <li>• Screwdriver – battery powered</li> <li>• Soldering Gun</li> <li>• Weed Whacker – electric powered</li> </ul>	<p>Maintain at least the recommended distance between the item and your heart device:</p> <p><b>12-Inch Distance</b></p> <ul style="list-style-type: none"> <li>• Car Battery Charger – 100 amps or less</li> <li>• Gasoline Ignition Systems – from components of ignition system</li> <li>• Gasoline Powered Tools – from components of ignition system (lawn mower, snowblower, weed whacker)</li> <li>• Generators – 20 kW or less</li> </ul> <p><b>2-Foot Distance</b></p> <ul style="list-style-type: none"> <li>• Bench Mounted/Free Standing Tools – for motors 400 horsepower or less (air compressor, drill presses, grinder, pressure washer, table saw)</li> <li>• Jumper Cables</li> </ul> <p><b>NOT RECOMMENDED</b></p> <ul style="list-style-type: none"> <li>• Chainsaws<sup>1</sup></li> <li>• Welding Equipment<sup>1</sup></li> </ul> <p><sup>1</sup> Avoid using a chainsaw and welding equipment. If required to use, contact Patient Services for guidelines.</p>

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## Medical/Dental Procedures

Many medical procedures will not affect your heart device; however, certain medical procedures introduce electrical current into the body that may affect an implanted heart device. Before undergoing any medical procedure, it is recommended that you advise your treating doctor or dentist that you have an implanted heart device and consult with your heart doctor to evaluate any possible associated risk.

No Known Risk	Minimal Risk	Special Considerations
<p><b>If the item is used as intended and in good working condition there is no known risk:</b></p> <ul style="list-style-type: none"> <li>• Acupuncture – no electrical stimulus</li> <li>• Bone Density Test (X-ray)</li> <li>• Bone Density Ultrasound – on heel or hand</li> <li>• Dental Drills</li> <li>• Dental Ultrasonic Scaler/Cleaner</li> <li>• Diagnostic X-rays (fluoroscopy)</li> <li>• Electrocardiogram (ECG/EKG)</li> <li>• Hearing Aid (in or behind ear)</li> <li>• Laser Surgery</li> <li>• Mammography</li> <li>• Positron Emission Tomography (PET Scan)</li> <li>• Sleep Apnea Machine</li> </ul>	<p><b>Maintain at least a 6-inch distance between the item and your heart device:</b></p> <ul style="list-style-type: none"> <li>• Diagnostic Ultrasound (Echocardiogram) – from transducer head</li> <li>• Hearing Aid Transmitting Necklace Loop</li> </ul>	<p><b>Consult further with your physician before undergoing the following procedures:</b></p> <ul style="list-style-type: none"> <li>• Acupuncture with Electrical Stimulus</li> <li>• CAT or CT Scans</li> <li>• Colonoscopy with Electrocautery</li> <li>• Electrocautery</li> <li>• Electrolysis</li> <li>• High Energy Radiation Therapy</li> <li>• Lasik Surgery</li> <li>• Lithotripsy</li> <li>• Radio Frequency Ablation</li> <li>• Therapeutic Ultrasound – from transducer head</li> <li>• Transcutaneous Electrical Nerve Stimulation (TENS)</li> </ul> <p><b>NOT RECOMMENDED</b></p> <ul style="list-style-type: none"> <li>• High Frequency (short wave) or Microwave Diathermy</li> <li>• MRI/MRA (generally not recommended – have physician contact Medtronic Technical Services for specific situation)</li> <li>• Transurethral Needle Ablation (TUNA®)</li> </ul>

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**Medtronic, Inc.**

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24-hour information available  
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**Medtronic**

*Alleviating Pain • Restoring Health • Extending Life*