LIVING WITH YOUR IMPLANTED DEVICE:

What You Need to Know About Electromagnetic Interference (EMI)

Boston Scientific

Your implanted heart rhythm device is designed to work properly around most appliances and equipment.

Most things you handle or work near every day will not cause a problem. However, people with all types of implanted devices do need to be aware that their device can be affected by electromagnetic interference (EMI).

What is EMI?

EMI is the term used to describe the effect of an electromagnetic field on the operation of an implanted heart rhythm device. Electromagnetic fields are invisible lines of force due to a combination of electrical fields (produced by voltage) and magnetic fields (produced by current flow) that an object emits. EMI occurs when the signals from an electromagnetic field temporarily interfere with the intended operation of the implanted device.

Some items we use in our everyday lives create electromagnetic fields. If you have an implanted heart device and get too close to certain items, EMI could affect your device.

How could EMI affect my device?

In some cases, an implanted device may sense the electromagnetic signals produced by some objects and misinterpret them as a rapid signal coming from your heart.

TYPE OF ITEM	Personal Items	Kitchen, Tabletop, Household Items	Office, Shop, and Yard Equipment
SAFE UNDER NORMAL USE[1]	Electric blankets Electric toothbrushes Electric razors Hair dryers Heating pads Pagers Patient alert devices Personal digital assistants (PDAs; unless used as cell phone; see cell phones)	Air purifiers Blenders Clothes dryers Convection ovens Electric can openers Electric ovens and stoves Food processors Gas ovens and stoves Microwave ovens Portable space heaters Vacuum cleaners Washing machines	Copy machines Electric invisible fences Fax machines Personal computers
USE PRECAUTIONS[2]	Cell phones ◆ Keep 6 inches from device ◆ Keep 12 inches from device if transmits more than 3 watts ◆ Hold phone to ear on the opposite side of body from device ◆ Do not carry phone in breast pocket or belt within 6 inches of device Cordless phones ◆ Safe as long as not placed directly over device Hand-held massagers ◆ Safe as long as not placed directly over device		Arc welding equipment ◆ Keep 24 inches from d For the following items, keep 12 inches from device ◆ Battery-powered cordl power tools ◆ Chainsaws ◆ Corded drills and powe ◆ Lawn mowers ◆ Leaf blowers ◆ Shop tools (drills, table saws, etc.) ◆ Snowblowers Running motors and alterna especially those found in ve ◆ Keep 24 inches from d ◆ Avoid leaning over runn motors and alternators running vehicle ◆ Distance required to dr ride in a vehicle is safe
DO NOT USE[3]	Body fat measuring scales (hand-held) Magnetic mattresses or chairs		Jackhammers

[1] Safe

These items are only considered safe from electromagnetic interference with your device when used normally in accordance with their intended use. Check with your doctor for any additional restrictions that you may have for these items.

[2] Use precautions

When you are near any of these items, you should use precautions. Check with your doctor for detailed information before using these items.

[3] Do not use

Talk to your doctor. The table lists a general category of items only. For specific branded items, consult the original manufacturer for any interaction with implantable devices.

	Entertainment Items	Travel/Environment	Dental and Medical Tests and Procedures
	AM/FM radios CD/DVD players Hot tubs/whirlpool baths (with permission from your doctor for your medical condition) Laser tag games Multimedia players such as iPods and MP3 players Remote controls (TV, garage door, stereo, camera/video equipment) Tanning beds TVs and VCRs Video games		Dental drills and cleaning equipment Diagnostic X-rays Electrocardiogram (ECG) Mammography (inform technician you have device to ensure device does not get compressed) Ultrasound
evice e: ess r tools ators, ehicles evice ning of a ive or	Bingo game magnetic wands ◆ Keep 6 inches from device CB and police radio antennas ◆ Keep 24 inches from device Slot machines ◆ Keep 12 inches from device Stereo speakers ◆ Keep 12 inches from device	Security systems (in airports, jails, and courtrooms) ◆ Walk through security archways normally ◆ Tell security personnel you have a device and show Medical Device ID card ◆ Security wand should not be held over device more than about 30 seconds; ask for hand-search if possible Theft detection systems (often in store and library entrances) ◆ Walk through theft detection systems at a normal pace ◆ Do not lean against or linger near these systems	Radiation therapy, electrocautery used in surgery, CT scans, TENS unit ◆ Contact your doctor ◆ For more information, call Boston Scientific Patient Services
			MRI scans Diathermy

- A pacemaker (including the pacemaker contained within a defibrillator) may interpret the signals as your heart rhythm. It may respond by withholding its pacing.
- A defibrillator may interpret the signals as a heart rhythm that needs therapy. This could cause the device to deliver a shock that you don't need. In rare cases, the device could withhold a necessary shock.

The effects of EMI are temporary. The closer your implanted device is to the item, the stronger the effect. The farther away, the less effect you will experience. EMI effects do not usually harm your device.

How can a magnet affect my device?

A magnet can also cause your implanted device to respond differently if your device gets within 6 inches of the magnet. Your defibrillator will respond to a magnet based on how your doctor has programmed your device to respond. A pacemaker will respond by temporarily pacing at a different pre-set rate. Ask your doctor for more information.

Note: If you have a defibrillator, some strong magnetic fields may cause your device to make beeping tones. If you hear beeping tones from your device, you should:

- Immediately move away from the object that may be causing the beeping.
- Call your doctor to report the beeping.

Which items are safe to use? Which items shouldn't I use?

The listing in this brochure gives a broad overview of which items are safe, which to use precautions with, and which items you should not use. This table includes some of the most common items that cause interference. It does not include every item that you handle or work near.

Talk to your doctor if you have more questions about a specific appliance, tool, medical procedure, or piece of equipment. Be sure to ask your doctor if you should follow any special instructions not listed here. For more information, you can also call Boston Scientific Patient Services at 1.866.484.3268 and visit www.bostonscientific.com or www.lifebeatonline.com.

Important Safety Information

Cardiac Resynchronization Therapy Devices
Cardiac resynchronization therapy pacemakers (CRT-P) and defibrillators (CRT-D) are used to treat heart failure patients who have symptoms despite the best available drug therapy. These patients also have an electrical condition in which the lower chambers of the heart contract in an uncoordinated way and a mechanical condition in which the heart pumps less blood than normal. CRT-Ps and CRT-Ds are not for everyone including people with separate implantable cardioverter-defibrillators (CRT-P only) or certain steroid allergies. Procedure risks include infection, tissue damage, and kidney failure. In some cases, the device may be unable to respond to your heart rhythm (CRT-P only) or may be unable to respond to irregular heartbeats or may deliver inappropriate shocks (CRT-D only).

Implantable Cardioverter Defibrillators
An implantable cardioverter defibrillator (ICD) can protect you from the effects of sudden cardiac arrest by reviving your heart rhythm. An ICD is not for everyone, including people with certain steroid allergies. Procedure risks include infection and tissue damage. In some cases, the device may not respond to irregular heartbeats or may deliver inappropriate shocks.

Pacemakers
A pacemaker system can monitor and treat your heart rhythm by delivering electrical energy to pace your heart when it senses a slow rhythm. A pacemaker is not for everyone, including patients with certain steroid allergies. Patients who have additional medical conditions that may not allow the pacemaker to function appropriately should not receive a device. Procedure risks include infection, tissue damage and kidney failure. In some cases, the device may not respond to your heart rhythm.

For All Devices
In rare cases severe complications or device failures can occur. Electrical or magnetic fields can affect the device. Only your doctor knows what is right for you. These devices are available by prescription only. Individual results may vary.

Device Quality and Reliability
It is Boston Scientific's intent to provide implantable devices of high quality and reliability. However, these devices may exhibit malfunctions that may result in lost or compromised ability to deliver therapy. Refer to Boston Scientific's CRM product performance report on www.guidant.com for more information about device performance, including the types and rates of malfunctions that these devices have experienced historically. While historical data may not be predictive of future device performance, such data can provide important context for understanding the overall reliability of these types of products. Also, it is important that you talk with your doctor about the risks and benefits associated with the implantation of a device.

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