

Cellular Phones and Implantable Devices

SUMMARY

Boston Scientific pacemakers and defibrillators include protection mechanisms to recognize and filter most environmental interference that patients may encounter. However, some electronic devices encountered by patients every day create an electromagnetic field that can temporarily affect the intended operation of an implanted pacemaker or defibrillator.

This article:

- Describes the potential interaction between cellular phones and Boston Scientific implantable pacemakers and defibrillators.
- Provides suggestions to minimize potential interactions.

ANSI: American National Standards Institute

AAMI: Association for the Advancement of Medical Instrumentation

ICD: Implantable Cardioverter Defibrillator

CRT-D: Cardiac Resynchronization Therapy Defibrillator

CRT-P: Cardiac Resynchronization Therapy Pacemaker

CRM PRODUCTS REFERENCED*
All ICDs, CRT-Ds, CRT-Ps and Pacing Systems

*Products referenced herein may not be approved in all geographies. For comprehensive information on device operation, reference the appropriate product labeling.

CRM CONTACT INFORMATION

Technical Services – U.S.
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Tech.Services@bsci.com

Technical Services – Europe
+32 2 416 7222
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Patient Services
1.866.484.3268 – U.S. and Canada
001.651.582.4000 – International

Electromagnetic Interference

Electromagnetic interference (EMI) occurs when the electromagnetic field of one electronic device interferes with the intended operation of another electronic device. Some electronic devices encountered on a daily basis generate EMI signals that can temporarily interfere with an implanted pacemaker or defibrillator. Some of the possible device responses include:

- **Asynchronous pacing**—pacing therapy provided independent of intrinsic cardiac activity when EMI signals are recognized as noise.
- **Inhibition of pacing**—pacing therapy not provided when needed because EMI signals are misinterpreted as a normal heart rhythm.
- **Inappropriate shocks**—unnecessary shock therapy provided when EMI signals are misinterpreted as a fast heart rhythm.

These effects are most often **temporary** and can be eliminated if the patient increases the distance between themselves and the source of EMI. Patients with an implanted pacemaker or defibrillator should contact their physician to better understand how these potential device responses to EMI may impact their specific health condition.

Cellular Phones

Cellular phones are a potential source of EMI for Boston Scientific pacemakers and defibrillators. To reduce the likelihood of interference, a patient using a cellular phone should observe the following precautions:

- Maintain a distance of at least 15 cm (6 in) between the cellular phone and the implanted device.¹ If the phone transmits more than 3 Watts², increase the distance to 30 cm (12 in) or more.
- Hold the cellular phone to the ear opposite the side of the implanted device.
- Do not carry a cellular phone in a breast pocket or on a belt that places the cellular phone within 15 cm (6 in) of the implanted device.

Interference caused by a cellular phone is **temporary** and moving the phone away from the implanted device or turning the phone off³ will return the implanted pacemaker or defibrillator to normal function.

Additional sources of EMI information:

- Boston Scientific CRM Technical Services
- **A Closer Look** entitled *Electromagnetic Interference and Implantable Device Systems*
- www.bostonscientific.com

¹Boston Scientific pacemakers and defibrillators comply with ANSI/AAMI PC69 standards, which are based on the use of a typical cellular phone held 15 cm (6 in) from the implanted device.

ANSI/AAMI PC69:2007. *Active implantable medical devices—Electromagnetic compatibility—EMC test protocols for implantable cardiac pacemakers and implantable cardioverter defibrillators*, 44.

²Typical handheld cellular phones transmit approximately 0.6 to 2 Watts. Higher powered cellular phones (above 3 Watts) typically rely on auxiliary antennas (located away from the handheld phone), amplifiers or high gain antennas (added on to any cellular phone) to increase the transmission power and range.

Federal Communications Commission (FCC) Web site. Available at <http://www.fcc.gov>. Accessed November 27, 2007.

³Many cellular phones have multiple power states. The phone must be powered off completely to prevent it from becoming a potential source of EMI.

Samsung SGHX507 [package insert]. Richardson, Texas: Samsung Telecommunications America; 2006, 93, 105.