



## Implantable Medical Devices and Electric Welding/Cutting

### INTRODUCTION

An implantable medical device is any medical device which is intended to be totally or partially introduced, surgically or medically, into the human body or by medical intervention into a natural orifice, and which is intended to remain after the procedure.

Implantable medical devices are classified as active or passive. Typical active implants rely on electrical energy to function. Passive implants perform their function without the use of electronic power.

Examples of active medical implants:

- Pacemakers
- Cardiac defibrillators
- Cochlear implants
- Diaphragm stimulators
- Insulin pumps
- Nerve stimulators
- Sleep apnea stimulators

Examples of passive medical implants:

- Artificial hip, knee and shoulder implants
- Spinal fusion hardware
- Screws for bone fracture repair
- Intra-uterine devices
- Coronary stents
- Artificial eye lenses

### NATURE OF THE HAZARD

Electric welding and cutting processes produce intense electric and magnetic (electromagnetic) fields. Active medical implants are electrical in operation and their ability to function can be affected by strong electromagnetic fields. Passive medical implants are typically not affected by electromagnetic fields.

Implanted medical devices might experience electromagnetic interference from the electromagnetic waves generated from welding and cutting processes and this could cause the implanted devices to not function properly.

### HOW TO REDUCE EXPOSURE

(Adapted from the Medtronic Patient Services Electromagnetic Compatibility Guide for Implantable Cardiac Devices)

- Limit welding to currents less than 160 amps.
- Work in a dry area with dry gloves and shoes.
- If possible, maintain at least a 2-foot (60 centimeter) distance between the welding arc and implanted device.
- Keep the welding cables close together and as far away as possible from your implanted device.

- Place the welding machine at least 5 feet from the work area.
- Connect the work clamp to the workpiece/metal as close to the point of welding as possible.
- Arrange the work so the welding torch or gun and electrode will not contact the metal being welded if they are accidentally dropped.
- Wait several seconds between attempts when having difficulty starting a weld.
- Work in an area that offers firm footing and plenty of room for movement.
- If you feel sick, immediately stop welding and seek medical attention.

Boston Scientific Corporation, 300 Boston Scientific Way, Marlborough, MA 01752; Phone: 800 227.3422; web site: [www.bostonscientific.com](http://www.bostonscientific.com)

American Heart Association, 7272 Greenville Ave., Dallas, TX 75231; Phone: 800-242-8721; web site: [www.heart.org](http://www.heart.org)

## TALK TO THE DOCTOR

If you are getting an implanted medical device and will be working with or around electric welding or cutting processes, talk with your doctor. Inform the doctor of your occupation and discuss your work. Implanted medical devices differ, and your doctor can select one that is less likely to be affected by interference.

## INFORMATION SOURCES

Medtronic, Inc., 710 Medtronic Parkway  
Minneapolis, Minnesota, 55432-5604;  
Phone: 800-633-8766; web site:  
[www.medtronic.com](http://www.medtronic.com)