
Diagnostic Services – Department of Radiology – Diagnostic Division

SUBJECT/TITLE: CT of Patients with Implantable and External Electronic Medical Devices

PURPOSE: Defines procedure for imaging patients with implantable and external medical devices

DEFINITION: Electronic devices include but are not limited to: Cardiac pacemakers, Implantable cardiac defibrillators, neurostimulators, drug infusion pumps (including insulin pumps), cochlear implants, retinal implants

Background: There have been a small number of reports to the FDA of adverse events in which CT scans may have interfered with implantable or external electronic medical devices. Adverse events reported to have been caused by x-rays from CT scans include unintended shocks from neurostimulators, malfunction of insulin infusion pumps and transient changes in pacemaker output pulse rate.

Risk can be significantly reduced by moving the device away from the region being scanned or by turning off the electronic device. The risk of a clinically significant adverse event increases with prolonged direct high dose exposure. To date, no patient deaths have been reported from CT scanning of implanted or externally worn electronic medical devices.

PROCEDURE:

1. Determine if implantable or external electronic medical devices are present by interviewing and informing the patient or reviewing CT scout view and if present, the location relative to the scan range.
2. If possible, remove device from scanning field.
3. Ask patients to temporarily shut device off during CT scan, if possible.
4. Minimize exposure to the device by using the lowest dose possible and making sure the x-ray beam does not dwell over device for more than a few seconds.
5. After the CT scan:
 - a. Have the patient turn the device back on.
 - b. Have the patient check the device for proper functioning, even if the device was turned off.

6. Advise the patient to contact their healthcare provider as soon as possible if they suspect the device is not functioning properly. For emergency situations, notify the appropriate response team.
7. If the patient reports any adverse event, a Patient Safety Net report should be submitted.