The learning objectives for attendees include:

1. To know the safety issues within MRI and the concerns cited by the Joint Commission.
2. To know the safety items and practice strategies presented in the ACR Guidance Document for Safe MRI Practice.
3. To understand the strengths and limitations of ferromagnetic detectors and how they can be used and sited in MRI suites.
4. To be able to interpret information about conditional implanted devices and implement safe MRI scanning strategies.

1. The static magnetic field (B0) in MRI is the primary cause of the following safety concern during patient care?
   - (a) Peripheral nerve stimulation
   - (b) Electrical current formation and tissue heating
   - (c) Attraction and torque of ferromagnetic material and objects
   - (d) Ionizing radiation build up during scanning
   - (e) Shim volume aperture size limitation

   Answer:  c

References:

2. The radiofrequency field (B1) in MRI is the primary cause of the following safety concern during patient care?
   - (a) Peripheral nerve stimulation
   - (b) Electrical current formation and tissue heating
   - (c) Attraction and torque of ferromagnetic material and objects
   - (d) Ionizing radiation build up during scanning
   - (e) Extremely loud noise during scanning

   Answer:  b

References:

"Numerical evaluation of heating of the human head due to magnetic resonance imaging", IEEE Transactions on Biomedical Engineering 51 (2004) p.1301-1309
3. The gradient magnetic fields switching rate (dB/dt) in MRI is the primary cause of the following safety concern during patient care?

(a) Peripheral nerve stimulation
(b) Electrical current formation and tissue heating
(c) Attraction and torque of ferromagnetic material and objects
(d) Ionizing radiation build up during scanning
(e) Shim volume aperture size limitation

Answer: a

References:


4. Ferromagnetic detectors can be used to:

(a) Screen patients for objects which may have high SAR.
(b) Detect an object that may be attracted to the magnet.
(c) Detect when vibrations affect magnet signal stability.
(d) Evaluate ionizing radiation levels during scanning
(e) Screen patients for DB/dt fluctuations that are beyond normal limits.

Answer: b

References:


5. MRI Conditional device labeling indicates:

(a) Devices which cannot be allowed to enter zone 4 of the MRI suite.
(b) Devices that have several features and conditions of operation
(c) Devices that are always safe to scan in MRI
(d) Screening methods to be used prior to entering zone 3
(e) Devices that can be scanned in MRI if specific conditions are met

Answer: e

References:


6. A new pacemaker has conditional MRI labeling that indicates:

(a) Safe MRI scanning is allowed under all MRI operation modes and device settings.
(b) Under no MRI conditions is the device safe in MRI, pacemakers are a contraindication in MRI.
(c) Second level operation mode is used for scanning this device when under appropriate supervision.
(d) Specific limitations of MRI operation, device setting, body location and monitoring to allow safe scanning.
(e) Device must be located outside of the maximum spatial gradient defined by the equipment manufacturer.

Answer: d

References: