

# Research Tech Accreditation

## MRI Policies and Procedures QUIZ

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Department: \_\_\_\_\_

Based on 11/04 of MRI Policies and Procedures Manual

Choose the single best answer for each question.

1. Written informed consent is required for routine CT or MRI exam in each of the following situations **EXCEPT**:

- a) Fetal MRI without contrast.
- b) Non-contrast head CT scan of pregnant patient.
- c) Pelvic MRI without contrast with conscious sedation.
- d) Contrast enhanced CT aortic angiogram.

*(please note that signed IRB approved consent forms are required for every research scan involving humans.)*

2. Approval for overtime authorization for service calls should be given in the following situations **EXCEPT**:

- a) The cold head compressor starts making louder and louder banging noises. It seems to be getting worse.
- b) You are scanning on a weekday evening and something breaks. Product pulse sequences will no longer run. There is a full morning outpatient schedule the next day.
- c) The scan room door is not sealing normally when you close the door, but the door stays closed and you see no image artifacts to suggest RF leak.
- d) The scan table breaks. Some patients are able to get up on the table with difficulty, others must be gang lifted.

3. With regard to injection of intravenous gadolinium,

- a) Gadolinium may be used in pregnant patients if written informed consent is obtained.
- b) A radiologist, radiology resident, or attending physician must be physically present in the department for gadolinium injection and must be available for at least 20 minutes following injection.
- c) Gadolinium should never be used in breast-feeding patients.
- d) There is no risk of allergic reaction to gadolinium-containing contrast agents.

4. A “magnet quench” means:
  - a) An electrical fault causes the RF and gradient electronics to shut down.
  - b) The main magnet becomes resistive rather than superconductive, resulting in rapid heating of the magnet windings, boiling off of cryogenics, and loss of main magnetic field.
  - c) The magnet core melts down into a pool of molten metal which may break through the outer containment shield of the magnet.
  - d) Sudden inductive load of main magnet windings causes large drain on municipal power supply, resulting in loss of electrical service in the building or surrounding neighborhood.
  
5. The major risk of injury or harm due to magnet quench is:
  - a) Sudden heating of the magnet may cause burns to patients in the bore.
  - b) Boiling cryogenics create asphyxiating steam.
  - c) Electrocutation by arcing of electricity across the main magnet windings.
  - d) Blinding flash of light.
  
6. In which of the following situations should you push the “Quench” button to cause a magnet quench:
  - a) Scan room fire.
  - b) A janitor has entered the room with a large floor buffing machine which is now stuck to the magnet. No one is hurt, but he can’t pull the machine off the magnet.
  - c) A steel oxygen tank was brought into the scan room and has flown across the room and stuck to the magnet, pinning someone’s arm in a painful crush.
  - d) All of the above.
  
7. After a magnet quench:
  - a) The superconducting magnet must be re-cooled with new cryogenics costing tens of thousands of dollars, and will likely be out of service for several days.
  - b) The magnet can be reset and back in service within a half hour.
  - c) The magnet is likely to be severely damaged and will need to be completely replaced.
  - d) A safety investigation must be carried out by the university’s Human Subjects Committee.
  
8. The emergency shutdown button (on Siemens magnets) or main power switch on the power distribution unit (GE) should be used to immediately cut power to the scanner electrical system in each of the following situations **EXCEPT**:
  - a) Scan room fire.
  - b) Sprinklers go off in scan room, but there is no fire.
  - c) Loud popping noises and smoke come from the scanner.
  - d) A patient in the scanner yells for help and becomes unresponsive.
  
9. Pressing the emergency shutdown button will:
  - a) Immediately cut electrical power to all components of the MRI scanner except the main magnet.
  - b) Cut power to the entire system and cause magnet quench.
  - c) Cause immediate reboot of the scanner computer.
  - d) Activate explosive bolts and automatic patient ejection system.

10. If a patient or research subject experiences a medical emergency while in the scanner:
  - a) The code team and supervising radiologist should be paged and resuscitation efforts commence immediately in the scan room.
  - b) The patient should be immediately removed from the scan room before any other steps are taken.
  - c) The scan room door should be propped open to allow unimpeded access to the patient.
  - d) A crash cart is available in the scan room.
  
11. During a clinical scan or research scan involving a human subject,
  - a) The patient's well-being may be monitored by a family member in the scan room.
  - b) The supervising radiologist should be called if the patient or subject complains of claustrophobia too intense to continue the scan.
  - c) The technician may monitor a communicative patient's well-being by talking with the patient between each sequence.
  - d) The patient or subject must not be allowed to sleep.
  
12. Patients with history of metallic foreign body in the eyes (including all patients who have worked as metal machinists):
  - a) Should have plain x-ray films of the orbits taken and evaluated by a radiologist to exclude metal foreign bodies in the eyes prior to entering the scan room.
  - b) May be scanned without prior orbital x-rays if asymptomatic (i.e. no symptoms of foreign body in the eye).
  - c) Must sign a waiver before being scanned.
  - d) Are not candidates for MRI examination.
  
13. The following statements about the scan room oxygen monitor are true **EXCEPT**:
  - a) The alarm may sound if there is a magnet quench or cryogen leak.
  - b) The alarm only sounds when the concentration of oxygen in the scan room has decreased to life-threatening levels.
  - c) If the alarm sounds, the scan room should be immediately evacuated.
  - d) If the alarm sounds, the service representative should be contacted before resuming scanning.
  
14. Regarding safety screening for MRI,
  - a) Normal healthy research subjects do not need to complete a Patient History/Safety Screening Form.
  - b) Patients or subjects with cardiac pacemakers are not to be scanned or allowed to enter the scan room.
  - c) Any metallic implanted prosthesis or medical device renders the patient ineligible for scanning.
  - d) Patients may be scanned in street clothes if the technologist has carefully screened them for ferromagnetic components.