

**SUNY DOWNSTATE MEDICAL CENTER  
UNIVERSITY HOSPITAL OF BROOKLYN  
POLICY AND PROCEDURE**

No: MRI-9

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Subject: MRI Personnel/Patient Safety

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**EC.02.01.01 (EP.16)** The hospital manages magnetic resonance imaging (MRI) safety risks by doing the following: Restricting access of everyone not trained in MRI safety or screened by staff trained in MRI safety from the scanner room and the area that immediately precedes the entrance to the MRI scanner room.

**EC.02.02.01 (EP.1)** The hospital identifies safety and security risks associated with the environment of care that could affect patients, staff, and other people coming to the hospital's facilities

UP.01.01.01

Issued by: Radiology Department

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**I. PURPOSE**

To ensure the safety of Patients and staff in the MR suite

**II. DEFINITIONS:**

MR suite consists of 4 zones. Each zone is specific to the activities which can take place in that particular zone. (refer to policy MRI-3 for details)

**III. POLICY**

Patients will be kept safe from injury due to magnetic field strength around the MRI Scanner. Patients with contraindications must not be brought into the magnetic field. Ferromagnetic object must not be brought into the field. Quenching of the magnetic must only be done as needed for rescue of a patient accident

**IV. RESPONSIBILITIES**

Technologist, physics, Radiologist, Anesthesiologists

**V. PROCEDURES/ GUIDELINES**

**MRI SAFETY The MRI machine is always on even if the machine seems to be off with (no patient on the table) the magnetic field is still present**

## MRI-9 MRI SAFETY INFORMATION

1. Never enter the MRI Room without checking with an MRI Technologist. They will prepare you to enter the room.
2. Never bring anything into the scan room without checking with the MRI Technologist or nurse.
3. All persons entering the MRI Room must be screened before entering the room. This includes patients, Visitors Nurses Physicians, Maintenance Staff, Environmental Services and any other staff member.
4. In an emergency situation: (code 66 /99)
  - Cardiac arrest./Respiratory arrest etc. the patient must be removed from the MRI Room before attempting any lifesaving procedures.
  - The MR conditional stretcher must be used to move the patient from the scan table out into zone 3.
  - Once the patient is removed from the scan room (zone 4). Close and lock the MR scan room door. This will prevent any untrained personnel from accidentally entering the scan room.
  - Life saving procedure can be initiated once the patient has been properly removed from the scan room (zone 4) and into zone 3
  - **Emergency procedures cannot be conducted in an MRI Room**
5. Items such as loose metal objects must be removed before entering the MRI Room. These includes:
  - 1D badges, beepers, cell phones, stethoscopes, scissors, hemostats,
  - Magnetic credit cards and tapes will be damaged.
  - Watches, beepers and other delicate instruments may be damage and other delicate instruments may be damaged.
6. **STRICTLY FORBIDDEN** – ***Oxygen tanks, pumps monitors ventilators, crash carts suction machines and any powered devices.***
7. Tools used for repairs or cleaning must be “nonferrous” which means no iron. The magnet will not attract them.
8. **People with pacemakers are never permitted to enter MRI Room. Please observe the signs posted on all doors.**
9. All patients must be identified prior to entering the “Scan Room” the Technologist will use **two identifiers (Name / DOB)** to verify patients. This information will be checked against the patient’s ID Bracelets for inpatients and Physicians prescription/order for outpatients. All patients will be scanned using the hand scanner prior to entering into zone 3. Once cleared of any surface ferro-magnetic objects, Patients will then pass thru the scan room doorway which is monitored by the ferro –guard system .
10. Upon confirmation of patients identity. The technologist will perform a complete “**time -out**” to include:

## MRI-9 MRI SAFETY INFORMATION

- Verification of PT. name (First/ Last & DOB )
- Patient Medical Record ( MR# )
- Correct procedure
- Correct site/ Body part
- Correct laterality,
- Correct contrast( if applicable)
- Correct agent, dose & route (if applicable)

**Remember never bring anything into the Scan Room. Equipment can only be brought into the Scan Room by the MRI technologist or the MRI Nurse There is no exception to this Rule**

**\*\* Remember the strongest area within the magnetic field is around the center of the magnet. This area is where the patient is lying during imaging acquisition and for safety reasons is a highly restricted area PLEASE COOPERATE**

### VI. FOUR MAJOR CONSIDERATIONS

1. Hazards to persons with cardiac pacemakers
2. Hazards to persons with certain types of surgical clips wires staples mesh etc.
3. Possible current (heating) induced in patients with ferrous prosthetic implants
4. The “**Missile Effect**” unrestrained ferromagnetic objects being drawn toward the center of the magnetic (Remember: this is where the patient is lying for the study)

#### **Effects from Magnetic Field**

##### I. Pacemakers:

The operation of demand type pacemakers can be altered by the magnetic field and may even stop operating. There is also a potential hazard of inducing a current into the pacemaker lead and thereby causing fibrillation.

##### II. Surgical Clips Greatest Concern Is Cerebral Aneurysm:

- The magnetic force can cause the clip to torque which in turn could rupture the blood vessel. Most abdominal clips are OK.
- Cardiac patients are now being scanned as early as 4 weeks post-op enough scar tissue is build up around the metal clips and does not pose a hazard.
- There are no contraindications to scanning patients who have cardiac stents or heart valves in place with a 1.5T system

##### III. Prosthesis Implants

- Most prosthesis implants have now been found to be OK. Heating of the tissue surrounding the prosthesis may occur. Therefore these patients should be screened thoroughly and will be considered to an MR procedure on an individual basis.
- The Radiologist will approve (or disapprove) any patients who have prosthetic implants or disapprove) any patients who have prosthetic implants or questionable surgical clips.

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- IV. The **“Missile Effect”** is the most important of all safety considerations.  
All personnel working in the magnet area must be constantly aware of the potential hazards from unrestrained ferromagnetic objects.

**Ferromagnetic Objects are made of:**

1. Iron
2. Nickel
3. Cobalt
4. Most Steels – certain grades of Stainless Steels are OK

**VII. Safety issues that must be considered when selecting patients for MRI Procedures**

There are certain safety issues that must be considered when selecting patients for MRI imaging and for anyone entering the magnetic field area. Among these being

- The presence of pacemakers and surgical clips and prosthesis.
- The MRI Technologist and all MR personnel must always remain aware of the potential hazard to both the patient and themselves due to the **“Missile Effect”** when working near the magnet.
- MRI personnel will report and maintain a log on all incidents involving patient injury due to ferro-magnetic objects entering the scan room (intention or unintentional)

**Note: There are additional hazards related to possible release of cryogenics during a QUENCH.** (see Siemens MRI Manuel) Quenching shall only be done to rescue a patient from a magnetic accident

**VIII. ATTACHMENTS:**

- MRI ZONING Sites

**IX. REASON FOR REVISION**

Review

**X. REFERENCES:**

Joint commission Standards

Date Review	Revision Required (Check One)	Responsible Staff Name and Title
8/2014	<b>Yes</b>	Frank Somma
2/2016	<b>YES</b>	Vincent Monte, Assoc. Director Radiology Department
3/2017	<b>No</b>	Vincent Monte, Assoc. Director Radiology Department
11/2018	<b>No</b>	Vincent Monte, Assoc. Director Radiology Department

