



Research MRI Safety Committee Standard

ACCESS CONTROL TO THE MAGNETIC ENVIRONMENT

Category: Magnetic Resonance Imaging (MRI) Safety

Standard #: MR.01

Applies to: Investigators, study personnel, Medical College of Wisconsin (MCW) staff

PURPOSE:

The Medical College of Wisconsin has maintained safe MRI scanning procedures in research studies using MRI for more than 30 years. The purpose of controlling access to Zone II, Zone III and Zone IV is to prevent injury, which could be fatal, to individuals entering the area. Access control also prevents damage to equipment due to the ever present and uncontrollable attraction of objects within the magnetic field of the scanner. The purpose of this document is to describe the guidelines pertaining to points of access, personnel with access to the appropriate zones, and equipment allowed in the magnetic environment.

DEFINITIONS:

Magnetic Environment: The area where the magnetic field is greater than 5 gauss resulting in the potential for objects to become missiles or projectiles as they are attracted into the magnetic field of the scanner. Individuals who may have cardiac pacemakers or other implants and devices may be at risk to enter the magnetic environment. The magnetic field is always present and is three dimensional around the scanner. This environment lies within Zone IV.

MR Personnel Level 1: An individual that has received MR safety training within the past 12 months.

MR Personnel Level 2: An individual who has received **extensive** MR safety training and competency within the last 12 months.

MRI: Magnetic Resonance Imaging which uses a strong static or main magnetic field, radio frequency pulses and time varying magnetic fields or gradients to produce anatomic images, spectroscopy, angiography, and functional data (fMRI).

MRI Safety Training: The required procedure that must be completed prior to working within Zones III and IV.

Non-MR Personnel: An individual who has not received MR safety training within the last 12 months and requires supervision in the MR environment.

Safety Screening: The process of inquiring about the safety of individuals, including research subjects prior to entering Zones III and IV. Safety screening also applies to checking equipment for safety prior to being used in Zone IV.

Tesla: The unit of measurement for magnetic field strength. 1 Tesla equals 10,000 gauss.

Zone I: An unrestricted area that is accessible to the general public. This area contains no risk to the general public.

Zone II: This area is accessible to the general public under the supervision of an MR personnel level 1 or 2. This area includes the patient or participant preparation zone and may have a changing room present.

Zone III: This area has direct access to Zone IV and requires only MR screened patients or participants and MR personnel. Patients, participants, and non-MR personnel must always be observed in this zone.

Zone IV: This is a highly regulated area that contains the MR unit. No non-MR personnel, participants, or patients are allowed in this area without the supervision of MR personnel level 2.

PROCEDURES:

A. Access Points

1. Key and/or badge access to the scanner magnet room is limited to designated MCW staff who are MR Level 2 personnel. Only some MR Level 2 personnel receive this access at the discretion of MR Level 2 trained MCW leadership.
2. The door to the scanner magnet room, or zone IV, must be closed and locked when no level 2 personnel is actively working within zone IV. Provided chain should be placed across door to help provide awareness for others.
3. The door to the control room, or Zone III, must be closed and locked except when entering and leaving the environment.
4. The door to the MRI hallway, or Zone II, must be closed when no one is within the immediate line of sight.
5. Failed access points (e.g. magnet room door left unlocked and unattended) should be reported to the Research MRI Safety Committee at MRiresearch@mcw.edu.
6. Questions and concerns about safe access to the MRI areas should be directed to the Research MRI Safety Committee at MRiresearch@mcw.edu.

B. Access by Study Staff, Patients, and Participants

1. Study Staff must complete MRI Safety Training before being granted badge access to Zone II or being allowed to enter zones III or IV.
2. Completion of initial MR Safety Training must be documented and renewed annually.
3. Study participants, patients, and non-MR personnel must undergo MRI Safety screening before entering Zone IV, the scanner magnet room. (See *Safe MR Scanning*, MR.SOP.011).

C. Allowable Equipment

- Equipment must be approved by the Research MRI Safety Committee prior to use for a research study or entry into Zone IV. (See *Equipment and Materials*, MR.SOP.02)

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