Research MRI Safety Committee Standard

EQUIPMENT AND MATERIALS

Category: Magnetic Resonance Imaging (MRI)

Standard #: MR.02

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

PURPOSE:

MR-related injuries and the few fatalities that have occurred at other institutions were the apparent result of failure to follow safety policies or the use of inappropriate or outdated information. The Medical College of Wisconsin has maintained safe MRI scanning procedures in research studies using MRI for more than 30 years. The purpose of this document is to ensure objects are safe to operate within and or be brought into the magnetic environment.

DEFINITIONS:

Equipment: Machines that may be used for MRI studies to monitor physiological processes or provide the stimulus or physical task for the study.

Materials: Pads, cushions or other objects that are not mechanical in nature but may be used with or near the research subject during the MRI procedure.

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.

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).

PROCEDURES:

A. Equipment must be approved by the Research MRI Safety Committee prior to use for a research study or entry into the magnetic environment.

B. Materials must be checked for safety prior to use in the magnetic environment.

C. Equipment must operate normally within the magnetic environment in order to be used during a research procedure.

D. Equipment must not emit spurious signals which will interfere with MR signals

when in use.

E. Equipment must be used within the manufacturer determined static magnetic field strength.

F. Equipment must be used within the manufacturer-determined spatial gradient magnetic field, if the apparatus will enter the threshold magnetic field associated with the scanner magnet.

G. Placement within the magnetic field must follow manufacturer specifications.

H. Equipment approved by the Research MRI Safety Committee is tested for ferromagnetic properties with a hand-held magnet outside of the MR scanner room before being brought within the magnetic field inside the room.

I. New equipment should be tested as it will be used during a study using a phantom or similar method prior to placement on or near a research subject.

J. Materials must be tested for ferromagnetic properties with a hand-held magnet outside of the fringe field before being brought within the magnetic field inside the scanner room.

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