

## MR Safety Standards for Medical Students Nationwide

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### Purpose

This educational e-poster reports the outline and design of a standard web based educational module with a concise multiple choice exam to be used for instructing medical students about basic MR and patient related safety. Direct instruction can be either interactive, with a traditional didactic lecture, or self administered online. Students regardless of their future should graduate from all physician programs with a basic understanding of MR safety, for both optimal ordering of studies and patient safety. Accessibility through the internet and the program ExamWeb are used to demonstrate and then document their proficiency utilizing a standardized multiple choice exam. Offering turn key materials, including the assessment, to all medical school programs will help ensure MR awareness and safety across the industry and remove dependence from individual programs.

### Outline of Content

The importance of MR safety for all physicians

A description of the program and example of implementation

Content:

Static magnetic fields ( $B_0$ )

Changing magnetic fields ( $G_x$   $G_y$   $G_z$ )

Projectile effects

Fringe fields

$B \propto 1/r^3$

Large objects attracted more strongly

Thermal effects

Nerve stimulation

Special Medical Patient Considerations

Pregnancy

Implanted devices (pacemakers, hearing aids, shrapnel, implants)

Gadolinium and Renal effects

Emergency procedures

Sample questions:

e.g. Which magnetic field interacts with the patient in an MRI scanner?

A) Static magnetic field B) Gradient field C) Radiofrequency field D) A and B E) A B and C

Resources for implementing at your institution

### Summary

In conclusion, this educational e-poster will review MR safety basics, and offer a module available to all educators through provided links and the Alliance of Medical School Educators in Radiology (AMSER) and the Association of University Radiologists. Concise explanation on how to implement the programming for medical student programming will be provided.

### Bad Intuitions

- It's a large object, so it won't be moved by a magnet
  - *BUT: the larger the object, the greater its force (and momentum) are likely to be*
- We're not scanning, so it's safe
  - *BUT: the magnet is ALWAYS on*
- They're safety professionals, so they'll know what to do
  - *BUT: most safety personnel (firemen, EMT's, police) do not have magnet training*