

Last summer a child was killed during a MR procedure when a ferromagnetic oxygen tank was rapidly sucked towards the magnet center. Several other less publicized deaths have occurred with MR in the past 15 years: 5 patients with cardiac pacemakers who inadvertently underwent a MR scan without the MR staff being aware that these patients had cardiac pacemakers; a patient with a brain aneurysm clip; one service engineer who was asphyxiated during a magnet cool down cryogen fill. Numerous MR patients have also suffered radio frequency (RF) burns and one MR patient lost their eyesight in one eye from the motion of a ferromagnetic particle within that eye. Almost all MR sites have had MR related incidents that could have caused injuries to patients and staff and these incidents are rarely reported.

Although MR manufacturers have installed hardware and software limits on RF and gradient magnetic field exposures, this protection did not and could not have prevented the deaths and injuries that have occurred. There are no technical solutions to prevent future MR caused deaths; MR safety requires education and adherence to MR safe practice guidelines.

The goal of this 4-hour continuing education course is to improve MR safety awareness thereby reducing MR caused injuries. The course objectives will address the following questions:

- 1) What are the underlying mechanisms and resulting MR hazards arising from each of the three MR fields: the main static magnetic field, the time changing gradient magnetic field, and the radio frequency field?
- 2) What safe practice MR guidelines should be implemented to reduce the chance of MR caused injuries to patients and staff?
- 3) What are the risks to a fetus from MR? What are the risks to the MR technologist from long-term exposure to the MR fields?
- 4) What are the IEC/FDA regulations governing patient and staff exposure to each of the three MR fields?