



MRI SAFETY ADDRESSED IN SENTINEL EVENT ALERT

by Dave Gourley RRT

Respiratory therapists were alerted to the safety risks of MRI's several years ago when a tragic accident claimed the life of a 6 year old child in New York. In this incident, a steel oxygen cylinder was apparently drawn into the magnetic core of the MRI, striking the pediatric patient in the head. The patient died two days later. Although accidents and injuries related to MRI's are extremely rare, The Joint Commission had received several reports of MRI incidents. This resulted in The Joint Commission releasing a Sentinel Event Alert entitled "Preventing accidents and injuries in the MRI Suite" in February 2008.

There are five MRI-related cases in the Sentinel Event database, four of which resulted in death. There were four adult

patients and one pediatric patient affected. In addition, the FDA's Manufacturer and User Facility Device Experience Database reports over 389 MRI related events, including nine deaths, over a ten year period. Ten percent

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of these events were "projectile related", highlighting the oxygen cylinder hazard.

Magnetic resonance imaging, or MRI, was introduced in healthcare in the late 1970s, providing a valuable diagnostic tool to physicians. Currently there are more than 10 million MRI scans performed each year across the country. The safety record has been excellent, which may lead to a lack of knowledge of the inherent dangers. The following types of injuries have occurred during MRI scanning:

- "Projectile" injuries from ferromagnetic objects (pens, oxygen cylinders, wheel chairs)
- Injury related to dislodged ferromagnetic implants (aneurism clips, pins in joints)
- Burns from objects that may heat during MRI (lead wires, surgical staples)
- Equipment/device malfunction or failure (microinfusion pumps, monitors, pacemakers, implantable pacemakers)
- Failure to attend patient support systems during MRI (oxygen cylinder or infusion pump run out)
- Acoustic injury from loud knocking noise from MRI scanner
- Adverse event from contrast agent
- Adverse event related to cryogen handling, storage, inadvertent release of superconducting MR imaging system sites

While The Joint Commission has only had one "missile-effect" or "projectile" incident, this type of event is more common than is generally recognized. Many healthcare workers are not aware that the magnet in the MRI is always active. "Quenching", or shutting the magnet off, is not routinely performed, and is an expensive and potentially dangerous procedure. This process includes the controlled release of cryogenic gases that can be fatal if released in a confined area.

The risk of a projectile is the most significant concern for respiratory therapists. The list of ferromagnetic objects that will be drawn to the magnet core is lengthy. In addition to medical gas cylinders, it includes cell phones, chest tube stands, clipboards, ID badges, keys, pulse oximeters, pagers, pens, IV poles, stethoscopes, scissors, stretchers, watches, and wheelchairs. It is essential that all respiratory therapists are cognizant of this whenever approaching an MRI suite.

The Joint Commission provided ten recommendations and strategies in an effort to reduce MRI accidents and injuries. The following are the recommendations directly related to the practice of respiratory care:

- Restrict access to all MRI sites by implementing the four zone concept as defined in the ACR Guidance Document for Safe MR Practices: 2007. (2) The four zone concept provides for progressive restrictions in access to the MRI scanner:
 - Zone I: General public
 - Zone II: Unscreened MRI patients
 - Zone III: Screened MRI patients and personnel
 - Zone IV: Screened MRI patients under constant direct supervision of trained MR personnel

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"The spirits want two forms of identification..."

1968 Remembered ... *Continued from previous page*

Several college civics groups tell us that today's college campuses tend more toward localized grassroots issues. Organized student groups are focused on volunteering and public service efforts. The Center for Research on Civic Learning recently released a study entitled "Millennials Talk Politics." (The Millennials are those young folk who were born after 1985). The study cites a growth in volunteer and public service efforts among today's college-aged youth and explains it as a desire by students to do service that yields timely and tangible results. Millennials have been dubbed the "quiet" generation noticeably less radical and less politically involved than were their predecessor groups.

1968 ultimately ended on an upswing when Apollo 8 circled the moon ten times. This event goes down in history as our country's premier success in space, a technological triumph that managed to pull us together as a nation, at least for that time being. But for those of us who lived through 1968... well, we'll surely never forget it and we still wonder how we managed to survive the tumult. During this 40th anniversary year, let us be grateful that we haven't seen its likes again.

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- Have a specially trained staff person who is knowledgeable about the MRI environment accompany any patients, visitors and other staff who are not familiar with the MRI environment inside the MRI suite at all times.
- Annually, provide all medical and ancillary staff that may be expected to accompany patients to the MRI suite with safety education about the MRI environment and provide all staff and patients and their families with appropriate materials (e.g., guidelines, brochure, poster) that explain the potential for accidents and adverse events in the MRI environment.
- Only use equipment (e.g., fire extinguishers, oxygen cylinders, and physiologic monitors) that has been tested and approved for use during MRI scans.
- Never attempt to run a cardio-pulmonary arrest code or resuscitation within the MR magnet room itself.

The complete text of this Sentinel Event Alert, Issue 38, February 14, 2008, "Preventing accidents and injuries in the MRI Suite", is available on The Joint Commission's website at: http://www.jointcommission.org/SentinelEvents/SentinelEventAlert/sea_38.htm

This Sentinel Event Alert is the latest release in the Sentinel Event Alert series that The Joint Commission began in February 1998. The information contained in the Sentinel Event Alerts is compiled from information voluntarily reported to The Joint Commission. Healthcare organizations must implement the recommendations in the Sentinel Event Alert or reasonable alternatives. For more information regarding all Sentinel Event Alerts, visit the Joint Commission International Center for Patient Safety website at www.jcipatientsafety.org.

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