

Improving MRI Safety at the University of Wisconsin Hospital & Clinics



Executive Summary

MRI safety was improved at the University of Wisconsin by the implementation of the following:

1. Outpatient Changing
2. MRI Safety "Time In" procedure prior to entering the scan room
 - * The "Time In" procedure prevented MRI safety hazards prior to almost one third (31%) of high risk inpatient MRIs.

To be presented Tuesday, November 30th, from 12:45pm – 1:15pm.



Purpose:

Patient safety in MRI has been an ongoing concern for our organization and across the country. In fact, according to the 2008 FDA accident report data, there has been a 310% increase in MR imaging –related incidents since 2004 (RSNA, 2010). According to Dr. Kanal, Legal Consultant involving MR accidents and lead author for the ACR Guidance Document for MR Practice, "a majority of MR safety incidents do not even make it to the FDA MAUDE database (RSNA, 2010)." Every year, many patients and providers rely on MRI for diagnostic imaging and it is our goal to keep these patients safe. On average, our MRI Department performs 28,000 exams per year. Due to the powerful static magnetic field of the MRI system and the risk of projectile related injuries, safety is top priority. Here at the UW Hospital & Clinics, MRI safety concerns are documented online through the University Health Consortium Patient Safety Net (PSN), which tracks potential safety and quality issues for the organization.

Methods:

Documentation of PSN reports for a total of 38 months (Jan 2007 through Feb 2010) were compiled and assessed. In total, there were 321 PSN reports submitted within those 38 months, 18 of the 321 were related to ferrous objects entering the MRI scan rooms.

In an effort to decrease the number of ferrous objects entering the MR scan room, the following processes were implemented:

Patient Changing - Of the 18 ferrous objects that entered MRI scan rooms, 10 objects were deemed preventable by outpatient gowning. Objects that were deemed preventable through patient gowning included: cell phones, external insulin pump, metal dental pick, metal comb, hair barrette, steel-toed boots, and pocket knives.

All outpatients are now required to wear MRI safe clothing before undergoing an MRI scan. Patients who do not arrive in MRI safe clothing are required to change into a hospital gown.

MRI "Time In" - The remaining 8 objects were discussed with MRI staff and were identified as objects entering the room via hospital staff & inpatients. Items included: IV pole, IV tubing, MD stethoscope, patient monitor, metal crutch, pressure gauge, MD cell phone, battery pack, and IV pump, telemetry unit, safety and hair pins, pagers, and metal jewelry.

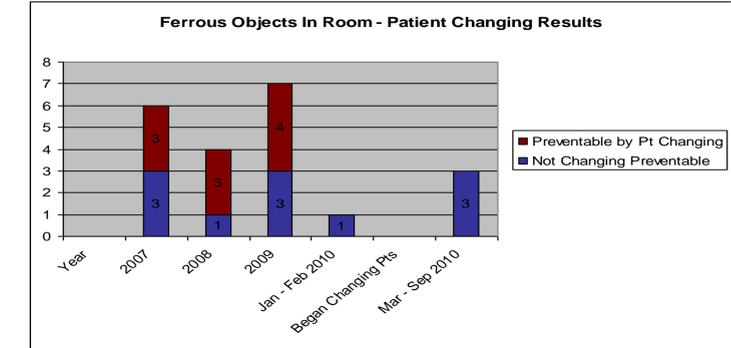
MRI Staff are now required to perform an MRI "Time In" procedure on all sedated, incoherent, and non-ambulatory inpatients prior to the MRI exam outside of the scan room in zone 3. This process was implemented to verify the following:

- Correct Patient (2 Identifiers (name, MR#, DOB))
- Correct Procedure/Body Part
- UW Screening form was completed for patient with no contraindications for procedure
- All non-compatible MRI equipment/devices/ferro magnetic objects have been removed from patient and hospital staff before entering the MR suite (including checking under sheets)
- All hospital staff and/or family members that are to enter the MRI suite have been screened and have removed all metal so they are considered MRI safe

Results:

Patient Changing - From March 1, 2010 – September 30, 2010 there were a total of 55 PSNs documented for MRI. Of the 55 PSNs, 3 were attributed to ferrous objects entering the scan room. None were considered preventable through patient changing. The 3 items were:

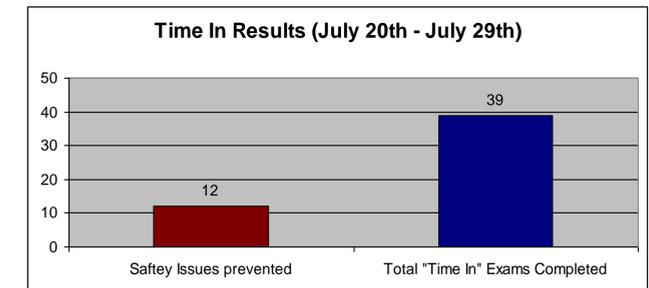
- 1) Cell phone – stored in the outpatient's underwear (patient arrived in MRI safe clothing – without pockets)
- 2) Cell phone – located between the inpatient's back & transfer sheet (spinal precaution patient)
- 3) Personal Nail Clipper – located in leg pocket of a floor RN (prior to MRI Time In implementation)



MRI "Time In" - The implementation of the MRI "Time In" process has proven successful and has greatly surpassed expectations. Documentation of the MRI "Time In" procedure was initiated on May 24, 2010 and ran through July 29, 2010. During that time frame a total of 185 "Time In" forms were completed by MRI personnel.

For ten days, July 20 – July 29, 2010, all potential safety hazards that were caught due to the MRI "Time In" procedure were documented. There were 39 MRI "Time In" procedures completed during that period of time. Of the 39 "Time In" procedures, 12 (31%) proved to have prevented potential safety hazards. The potential safety hazards identified through this process included:

- Body piercing on patients
- Under wire garments on patients
- Ferrous instruments
- Patient without identification bracelet
- Telemetry units and wires
- Metal Jewelry
- Metal hair pin
- Physician with pager
- Patient relative with metal in eyes
- Safety pins
- Nicotine patches



Feedback:

Regarding "Time Ins", one technologist stated that "Time Ins' have been working – we're catching things. (Non-MR) Hospital staff now check their pockets. As a technologist you feel confident that you've got the right patient and body part going into the room. We've never had that before."

In addition, when our MRI Division Chief was updated with the initial results of the "Time Ins" and that a lot of minor items had been detected but no major items, he responded, "What we've caught is great. It's the type of things I really want to catch. It's the small objects that get stuck and lost in the bore of the magnet, which compromises our image quality for a week's worth of patients, then requires service to resolve the issues."

Conclusion:

Based on these results, the initiatives to improve MRI safety are proving successful. Feedback from staff regarding outpatient gowning and the MRI "Time In" process has indicated that the number of ferrous objects entering MRI scan rooms have been reduced. The metrics displayed above also show improvement in each desired target area. Also, based on staff and patient feedback we have improved our safety and quality performance in MRI.

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Sources:

RSNA. (October 2010). *Spike in MR Imaging Accidents Underscores Need for Regulation*.
http://www.rsna.org/Publications/RSNAnews/October-25010/accidnets_feature.cfm.