

Wolfe Tales

The Next Step in MRI Safety

by Glen L. Wolfe CBET

Patient safety is a topic that is always at the fore-front of medical professionals' thoughts. Biomedical technicians' jobs exist primarily to ensure patient safety. Whether it is maintenance, repair or calibration, fundamentally safety is at the core of the profession.

MRI accidents, due to the extraordinary forces involved, garner particular attention within as well as outside the medical community.

Who can forget the six year old boy who was killed when an oxygen tank was pulled into the MR scanner he was occupying? Other documented incidences include infusion pumps flying into scanners (luckily no patient harm occurred); while another, oxygen tank incident, resulted in minor injuries to hospital staff. Even something as innocent as a hairpin has been lodged into a patient's nasal cavity.

Although patient safety is the number one issue, finances are an important decision-making factor to administration. The incident resulting in the six year old boy's death obviously resulted in huge law suit. Additionally, a fine from the New York State Department of Health of \$22,000 was imposed while manpower, downtime and repair costs exceeded \$100,000. This one case was a terrible lost in life, reputation and money and the real tragedy is that it could have been prevented.

Of course the tragic loss of life outweighs

all other factors in the incident, but let's consider the cost of a less dramatic accident. No patient is involved, no outside media is aware, no medical personnel are involved. The only witness is the night shift cleaning crew who is assigned to buff the floors in the MR suite. Once the control room is finished the buffer is wheeled toward the scan room, a strong tug is felt, but it's too late, the buffer is flying into the bore.

This particular incident occurs much more often than the published occurrences involving injuries to patients and personnel, but the cost is still high. Removing a large object from the bore of an MR magnet may involve "quenching" the magnet. That is releasing the cryogens thus removing the magnetic field. Once the object is removed, damage must be assessed, repairs made, cryogens re-introduced, and the magnets re-ramped and calibrated. This all costs money to buy parts and pay the repair personnel. The down-time of the MR costs money through losses of revenue. It would not be unusual for the total financial impact of this accident to cost \$25,000 to \$50,000.


How can this be prevented? The obvious answer is education. All medical facilities have staff education protocols in place. Medical staff already use hand held metal detectors to screen patients and personnel entering the MR suite, but accidents still happen. What more can be done?

An automatic continuously operating

scanning system located at each entry to all MR scan rooms would be ideal and this need has been met. Kopp Development, Inc, has brought to market a ferromagnetic detector which can be tailored to fit into pre-existing doorways or operated as free standing walk-through devices similar to the metal detectors prevalent in airports.

This device can detect objects as small as hairpins and also alert the screener as to the location of the object. Testing of the "FerrAlert Halo™" revealed that 44.3% of patients already pre-screened were identified by the Halo as still possessing ferrous objects on or in them.

These results are just one reason the ACR Guidance Document for Safe MR Practices recommends ferromagnetic detectors, and should alert hospital management to the ineffectiveness of current screening practices. Ferromagnetic detectors located at MR scan room entries can reduce patient incidents and should virtually eliminate the off-hour accidents involving non-clinical personnel inadvertently introducing tools and machinery to the magnetic pull of the MR. The investment in these safety devices should be recouped quickly through reduced downtime, labor and repair costs associated with emergency repairs.

It is not often enough that improved patient safety can be directly linked to cost savings and greater up-time, but when the opportunity arises it should be seized. 



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