Screening the Patient: How to deal with the individual subject

Wm. Faulkner, B.S.,R.T.(R)(MR)(CT), FSMRT
William Faulkner & Associates

MR Safety is often about mitigating risk to the patient. Because there are many factors that can and do vary with each patient, each patient should be safety screened accordingly.

There are two major opportunities which should be taken to screen patients. The first is when the examination is requested or scheduled. At this point it can be ascertained if the patient has any implants and/or devices. Knowing this ahead of the patients arrival allows for adequate research into the specifics of the device or implant to determine the conditions under which the patient may be imaged safely. Secondly, it allow for the determination of the patients condition which may affect the patients ability to tolerate the scan. In particular, their weight and the ability to lie on their back and remain still for extended periods of time.

Claustrophobia, in my opinion, should not be part of the pre-screening process. True claustrophobia is not that common and if you cause the patient to begin to worry about this, you will likely increase the probability of the patient having issues with lying in the magnet when they arrive. There are several methods for dealing with a patient's anxiety which manifests in a claustrophobic-type response but that will not be covered in this presentation.

The second and main safety screening occurs when the patient presents for the MR examination. Sample screening forms are readily available on line (www.mrisafety.com). They should be detailed and thorough. Making the screening form shorter so that it can be more easily filled in by the patient only serve to increase the likelihood that something which could be a safety concern will be overlooked.

The MR safety screening form is not just a part of the "paperwork" of the MR procedure but a very critical and important tool used to mitigate risks for the patient

While it may save time to have the patient read over the form and fill it out, it may be too confusing for some people (especially those who are older or confused). It is very important for trained individuals to be available to assist the patient if needed.

The primary responsibility for the MR safety screening of patient should rest with the MR technologist or radiographer. But again, anyone who participates in the screening process should be thoroughly educated and trained in this process.

The technologist/radiographer who is performing the MR exam should be the main person who verbally and interactively goes over the screening form with the patient. This serves a couple of functions. First, the technologist can personally assess the patents cognitive ability and therefore the reliability of the information they give. Secondly, it provides an opportunity for the technologist to introduce themselves as the person who will be performing the procedure and explain the MR procedure to the patient. This allows the patient to ask any questions and helps to minimize any anxiety about the procedure. This personal "connection" is often overlooked in today's environment. Without it, I believe patients are more likely to have difficulties tolerating the procedure.

Ferromagnetic detection should be considered as a means of further enhancing the safety screening process. The use of ferromagnetic detection does not replace any portion of the screening process but adds another tangible layer of risk reduction.

In the early days of MRI we were diligent in dressing patients in clothing we provided (scrubs or gowns) which we knew to be free of any metallic components. Over time, it seems we have grown complacent or just plain lazy. It is now common to allow patients to remain in street clothes. The danger is that metallic components and even metallic fibers are common and have been demonstrated to pose hazards and have resulted in injuries.

The FDA's MAUDE database, contains a report of a patient receiving 3rd degree burns when her blouse caught fire during the first series of a shoulder exam.

In the AJNR, there is a report of a cutaneous burn which occurred when a patient was allowed to wear an undershirt which was retrospectively found to contain non detectable metallic microfibers.

Furthermore, injuries from objects such as nail clippers, which were not removed from pants pockets have been documented.

When combined with ferromagnetic detection, having patients change out of street clothes and into MR-appropriate attire can greatly reduce risks of injury to both the patient and the MR staff.

With regard to implants and/or devices, it is imperative to both use proper terminology and understand it's meaning. Based on the ASTM standard F2503, an item that is MR safe has been shown to pose no known hazards in **all** MR environments. Anything which is metallic, magnetically or electrically activated cannot and will not be labeled as "MR Safe".

Implants/devices which contain metallic components or those which are considered active devices will be labeled either as MR Unsafe or MR Conditional.

MR unsafe means that an item has been shown to pose hazards in all MR environments.

MR conditional labeling means that an item has been shown to pose no known hazards in a specified MR environment under specified conditions of use. Typically, the more complex the device, the more stringent the conditions of use.

It is therefore imperative to determine the exact information about a device (including vendor, make, model, etc) to determine the conditions of use in order to assess the risks (if any) to the patient. These risks can vary with: the patients size, the device location, the anatomy being imaged, the types of RF coils utilized, the field strength of the MR system, spatial field gradients, slew rates of the time-varying gradient fields, etc.)

While the MR technologist/radiographer plays an important role in this process, the final determination of risks to the patient rests with the MR radiologist.

Again, each MR patient presents with their own unique history. the risk will vary with each patient. Each patient should be thoroughly screened accordingly. The implementation of so-

called “blanket policies” for patients with implants and/or devices are reflective of a lack of knowledge regarding MR safety issues.