

Nosocomial Infections: MRSA and Your MRI

By [David W. Boles](#) on November 12, 2008 9:39 AM | [10 Comments](#)

"Nosocomial" means "hospital acquired" and few people believe you can get infected by bacteria lurking in a hospital. We are often of the [notion that hospitals](#) and medical offices are always sanitary and cleaned every day. Sometimes, though, other patients can infect us with their ills when we visit our doctors. When your hospital makes you sicker, you have a nosocomial infection.



Dr. Peter Rothschild has [written a scathing report](#) about the unsanitary conditions infecting many MRI machines. [MRSA](#) is one of the most dangerous and pernicious SuperBug infections. 30 years ago, MRSA was responsible for only 2% of staph infections.

Today, that number has ballooned to 70%. MRIs, one of the most ingenious medical devices ever invented for seeing into the body, are a safe haven for bacteria because the heavy-duty magnets in the machines make it a dangerous experience to clean on a regular basis.

Dr. Rothschild writes:

This author knows of no imaging center or hospital that pays their Level 2 MR personnel (i.e., the technologists) to wait around for the cleaning crews to come in and monitor them the entire time that they are cleaning the room. Therefore, the responsibility to clean the scan room is sometimes assigned to one of the MRI technologist or, more commonly, this responsibility is simply overlooked. However, the paradox is that the MRI technologist, who in almost all imaging centers is the Level 2 trained person, is rarely an experienced or even trained cleaning person with very limited time to clean.

This paradox is clear when asking the question, "Is the scan room being cleaned and if so by whom?" The answer that this author normally receives is "of course it's being cleaned by the cleaning crews that come in at night after we leave." It is crucial to ask the next question, "What Level 2 personnel are present to monitor the cleaning crew to make sure that it is done properly and safely?" This author knows of no cleaning crew that has the background training to be Level 2 personnel. Additionally, the cleaning crews contacted by this author have all stated that they been told or simply assume that they are not to go into the scan room. Cleaners often describe the MRI suite as the room with all the signs on the door warning them not to enter.



In addition to MRSA infections, there is risk of blood and bodily fluids cross-contamination:

Additionally, MRI technologists, especially those who trained in the 1970's and 1980's, had little training in infection control or proper cleaning procedures. An average MRI may scan 3,000 to 5,000 patients a year. CT scanners usually scan double or triple that number. The probability is that at least 50 - 100 of these patients are infected with MRSA or other HAI and many more are carriers.

Another area of potential exposure to infectious agents is the use of IV contrast material for both CT and MRI, which significantly increases the risk of blood contamination. The simple task of removing a needle from a patient's arm and placing it into the sharps container has great risk. Blood can drip from the needle or from the puncture wound onto the pads, table and floor. This blood can often be unnoticed by a busy technologist or doctor performing the injection resulting in a contamination risk. It is not uncommon to find dried blood in an imaging suite which is an excellent culture medium for MRSA.



Contamination by forced air is another rising issue:

[MRI] Table pads inherently have air within them. When a patient lies down on the pads, this air is forced out through any hole or seam in the covering materials. This can cause the bacteria contaminating the central foam core to become ejected from the pad and aerosolize into the room environment. Of course the reverse air flow caused by the patient arising off the pads causes infectious materials to be drawn into the foam core from the surface, which is then re-ejected into the air when the next patient lies on the pad.

There have been numerous articles discussing the possibility of MRSA or other pathologic microorganisms becoming airborne during activities such as bed making and thus the possibility that MRSA can be transmitted among patients through the air (Shiomori.). There is also a suggestion that airborne MRSA may play a role in MRSA colonization of the nasal cavity or respiratory tract. Wilson showed that the presence of airborne MRSA in an area is strongly related to the presence and number of MRSA colonies and infected patients in that area. Shiomori states that measures should be taken to prevent the spread of airborne MRSA to control nosocomial MRSA infection.



On disinfecting the Magnet Bore:

An area of proven risk of MRSA is the inside of the MRI itself, often referred as the magnet bore or tunnel. The risk of MRSA transmission is increased in this area because the patient is often touching or in very close contact with the surface of the bore. It is obvious that cleaning inside the bore of an MRI unit is a difficult, dangerous and cumbersome task. The fact that most cleaning tools can not even be brought inside the MRI room, and especially into the bore, makes this task even more difficult.

The best possible way to clean the bore is to physically crawl inside to clean and disinfect the entire bore by hand. Unfortunately this also puts the technologist in very close contact with the contaminated surfaces and is yet another reason this is almost never done. In fact, the author, in over 25 years, has never seen a cleaning crew or technologist clean the inside of the MRI bore.

Dr. Rothschild provides this insight for the rise in MRSA infections during MRI scans:

The other practice that contributes to this situation is that MRI center often will overbook, that is put patients in time slots that are too short to perform a complete study, or add patients on to a full schedule. This is similar to the airlines overbooking, knowing that a number of patients will not show up for their appointment. Unless an MRI center overbooks patients, the "no shows" will have a disastrous effect on the bottom line since they take up time slots which cannot be charged for.

Merely two "no shows" a day, can mean up to \$300,000 loss from the bottom line each year for an MRI center that may already be struggling. The profit of these imaging centers, which is a fixed cost business, is directly proportional to the number of scans completed in a day. The difference between scanning two patients an hour and three patients an hour can be significant, accounting for as much as an additional \$1 - 2 million in annual revenue.

I urge you to [read Dr. Rothschild's entire report](#).

Dr. Rothschild's conclusion includes 11 suggestions for infection control at free-standing imaging centers and hospital radiology departments -- and it is your job, as the cogent and well-informed patient -- to demand your right to be protected and defended against the infections of those scanned before you.

10 Comments

 [Gordon Davidescu](#) | [November 12, 2008 10:39 AM](#) | [Reply](#)

That is downright frightening and makes me rethink whether I would ever even accept an MRI offer.

 [Dananjay Anandan](#) | [November 12, 2008 11:00 AM](#) | [Reply](#)

Wow! It's unbelievable that precautions for this haven't been taken already. I'm certain that this is the case here as well. Scary!

 [Kathakali Chatterjee](#) | [November 12, 2008 11:52 AM](#) | [Reply](#)

Interesting discovery David, makes me wonder whether one day we will be better off outside the hospitals etc. as all the germs and infections would be there inside?

 [David W. Boles](#) replied to [comment from Gordon Davidescu](#) | [November 12, 2008 12:29 PM](#) | [Reply](#)

When you read the article, Gordon, you will not like the fact that many hospitals, before releasing you, require an MRI to confirm you're okay.

 [David W. Boles](#) replied to [comment from Dananjay Anandan](#) | [November 12, 2008 12:31 PM](#) | [Reply](#)

You should ask around, Dananjay! Find out what their "infectious disease policy" and if they don't have one, run!

How many doctors offices wipe down the exam table after each patient? They usually just cover the table in paper or cloth and consider that "cleaned" when it absolutely is not.

 [David W. Boles](#) replied to [comment from Kathakali Chatterjee](#) | [November 12, 2008 12:36 PM](#) | [Reply](#)


There might well be a way to be healthier at home than in the hospital, Katha, especially with the rise of the SuperBug that cannot be killed and lives in hospitals and doctors offices.

One way of saving time in MRI offices is to let the patients wear their street clothes in the machine instead of stripping them down to gowns. That saves time and laundering costs -- but the backend is terrible for the patients because each person is re-contaminating an already contaminated MRI machine with all the crud and disease that is already on their bodies from the outside world! Dr. Rothschild addresses that in his article as well.


Now we need to stay away from MDs with white coats:

<http://www.ncbi.nlm.nih.gov/pubmed/1773186>

It seems plain clothes for MDs are better than their "comforting" white coat uniforms that harbor all sorts of nasties!

 ANNE | [November 12, 2008 3:01 PM](#) | [Reply](#)

This is super gross. I don't know why we should think hospitals are clean. A lot of filthy stuff happens there.

 ANNE | [November 12, 2008 3:03 PM](#) | [Reply](#)

Oh I just read the part about the white coats. Total ugh. I need to bring my own vacuum to my doctor visits.

 David W. Boles replied to [comment from ANNE](#) | [November 12, 2008 3:26 PM](#) | [Reply](#)

That's true, Anne -- hospitals are the best of us and the dirtiest of us. MRI machines are especially prone to this sort of filth because of the heavy magnets used and their danger to metal things and the people wearing and using them. You have to basically be certified or supervised by someone certified before you can even step into an MRI machine room.

 David W. Boles replied to [comment from ANNE](#) | [November 12, 2008 3:26 PM](#) | [Reply](#)

Yeah! Out with the White Coats!

I wonder what that would do for those with "White Coat Hypertension?"