

WHITEPAPER

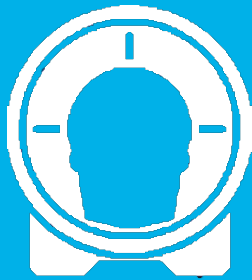
# RADIOLOGY: A HUB FOR SUPER-BACTERIA

Tips on Reducing MRSA Transmissions



## ABSTRACT

Multidrug-resistant bacteria are a risk to any patient going into hospital for treatment. Studies claim these bacteria are responsible for over 5,000 deaths in Europe alone. Thus, it is generally accepted that Radiology plays an important part in all this, because of the high number of inpatient and outpatients being sent for scans. Radiology is a hub for multidrug-resistant bacteria. This whitepaper is to raise awareness and prevent unnecessary risks.



## BACKGROUND

Methicillin-resistant *Staphylococcus aureus* (MRSA) was discovered in the 1960s. About ten years later MRSA was responsible for 2% of *Staphylococcus aureus* infections; today it's between 50% and 70%. According to estimates from 2012, Europe sees around 170,000 infections every year, and over 5,000 deaths - and that's just MRSA infections.

An article from "Die Zeit" talks about 91,000 deaths in Europe every year due to infections with resistant and other germs. This is a staggering number that could actually be preventable – or at least reduced. There are different ways to deal with the spread of these germs.

Radiology plays an important role in all this. So many patients come into contact here, increasing the chance of transmission. The fact, that MRSA can be transmitted from asymptomatic patients is even more critical in such a crowded place.

Studies from 2005 and 2006 claim that there are around 53,000 carriers of MRSA worldwide

## Radiology: A Meeting Point for Germs

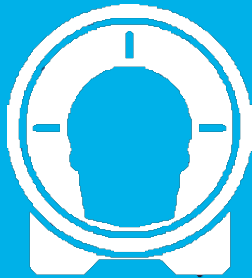
The high number of MRSA carriers represents a particular danger to the Radiology department. Both inpatients and outpatients are sent for just a quick MRI or CT examination to make sure nothing is missed. Since almost every ward sends patients for scans, it's not surprising that germs spread quickly within the entire hospital.

Thus, radiology is a very busy place, and therefore a very stressy place as well, which results in very little time between patients and therefore puts a strain on hygiene procedures. There often isn't enough specialist staff (e.g. Hospital Hygienist, Hygiene Care Staff) present or the radiologists themselves aren't trained enough in all areas of hygiene.

For example, a US study on the prevention of infections in MRI showed that it's inside the MRI chamber itself where patients are at very high risk of MRSA infections, for the simple reason that patients are in very close contact with or even touch the machine during MRI examinations. On the other hand, in most cases the MRI chamber must be cleaned by hand, since most cleaning implements can't be used around the powerful magnet. Cleaning by hand in turn increases the risk of infection in the person cleaning.

There are so many reasons why Radiology represents a potential risk for MRSA infections - but there are ways to reduce this risk.

These are the points we want to focus on.



# WHAT DO WE NEED TO CHANGE?

## Hand – and Surface Disinfection

Contact tests to determine microbiological status show that CT and MRI workstations contain numerous contaminants, not only from common skin germs but also fecal germs and antibiotic-resistant pathogens. This is most probably due to inadequate and irregular hand disinfection by technical and medical staff. Once a surface is infected, the pathogens and bacteria can spread by touch to all surfaces of the room and machines including the CT and MRI injector.

Regular training on hygienic hand disinfection is therefore strongly recommended, as is the right way to put on and remove protective clothing.

Surfaces and equipment that cannot be cleaned by the cleaning staff, must be cleaned in set intervals, as the case may be several times a day, using specific solutions.

## Cleaning between Patients

Strict time constraints can mean that not enough care is taken to clean equipment between patients. But if you just invest a little more time you can stop the multidrug-resistant bacteria from spreading to the worksurface, and reduce the risk of infection-related downtime.

## Damaged Positioning Aids

The MRI expert Peter Rothschild says that in many MRIs there is the misconception that placing a disposable cover over a contaminated bed will protect from contamination. That's not true. Neither protective covers nor disposable towels are a barrier against germs and quickly become penetrable if they rip. At that, positioners are often still used even if they are damaged. Pads and positioning aids also offer the perfect conditions for MRSA germs, surviving there for several months.

Germs and bacteria are very unlikely to survive disinfection on smooth surfaces, but with porous surfaces, studies show that staphylococcus aureus has been discovered even after disinfection.

When positioning aids were developed in the 80s and 90s, nobody knew they'd be used so intensively for such a long time. Positioning aids are therefore usually covered in a simple plastic-coated cover to make them waterproof. Cleaning detergents and their use cause covers to tear and the foam appears on the surface. Once the foam is infected, there's no way to disinfect it any more. It is therefore important to examine the seams regularly under a magnifying glass.





# GUIDELINES FOR PREVENTING MULTI- DRUGRESISTANT GERMS

To prevent the spread of multidrug-resistant bacteria, it is essential that Radiology departments take hygiene issues more seriously. These 11 steps from "Medical News Today" summarize where to concentrate on:

1. Have a written infectious control policy to include MRI cleaning procedures as well as the cleaning schedule and have it posted throughout the center.
2. Implement a mandatory hand washing / hand disinfection procedure between patient exams for radiology staff and any others who come into contact with patients.
3. Clean the MRI tables, inside the bore of the magnet and any other items that come into contact with a patient. Infection control experts recommend this to be done between each patient.
4. Clean all pads and positioners with an approved disinfectant. Infection control experts recommend cleaning after each patient.



5. Periodically inspect the pads with a magnifying glass,. particularly at the seams, to identify fraying or tearing. If present the pads should be replaced.
6. Regularly check all padding material with an ultraviolet (black) light and make sure that any biological material detected on the pads can be removed.
7. Replace damaged or contaminated pads with new pads incorporating permanent antimicrobial agents.
8. Use pillows with a waterproof covering that is designed to be surface wiped. Replace pillows when their barrier is compromised.
9. Promptly remove body fluids, and then surface disinfect all contaminated areas.
10. If a patient has an open wound or any history of MRSA or other infection:
  - a. Gloves and gowns should be worn by all staff coming in contact with the patient.
  - b. Set aside more time for infected patients to assure there is enough time to thoroughly clean all the pads and the MRI table before the next patient is scanned.
11. All furniture should be periodically cleaned. Ideal surfaces are those that are waterproof and wipeable. Infection control experts recommend cleaning after each patient.

## Good to Know

- An investigation in Scotland showed that disclosing MRSA infections has a positive effect in a hospital setting: by that the number was reduced from 7,700 to 900 infections a year. Researchers believe that disclosure made staff more aware of hygiene issues.
- In 1968, British microbiologists Henry Druett and K.R. May discovered that the intestinal germ *Escherichia* died off within two hours after being exposed to the cold. To this day, we still don't know exactly why this happened, but the WHO recommends ventilating hospitals as much as possible.



## CONCLUSION

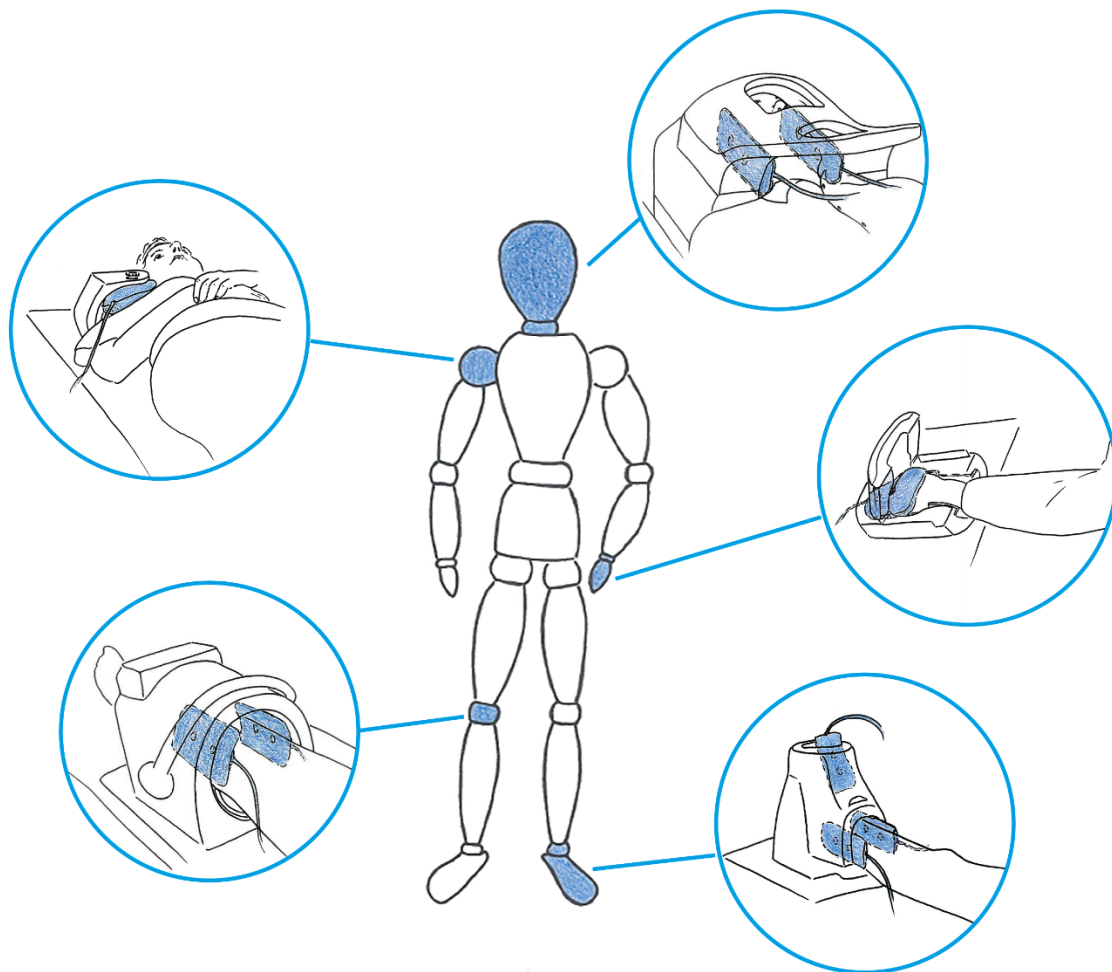
By informing staff, we can stem the spread of multidrug-resistant germs in Radiology. This affects both patients and staff and can drastically reduce the cost of aftercare due to these infections.

## Positioning Aids and Pillows

The pillows and positioning aids used during scanning pose a major risk and must be checked regularly and immediately after each patient. Based on this thinking, Pearl Technology has worked together with ETH Zurich and other prestigious institutions to develop the MULTI-PAD positioning support.



With these flexible and universal pads you can secure the patient in the right position for any examinations using head and extremity coils. The product is 100% hygienic and available in various models. It is easy to clean and provides reliable protection, promoting the safety and well-being of the patient.



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## About Us

As well as standard radiology products, Pearl Technology AG develops and produces customer-specific solutions for the industry, including individual solutions for research into various areas of medical technology. The main features of this patented technology, based on rheumatthritis research on high-resolution pQCT systems, are a high degree of variability, a consistent pressure distribution and adjustable attachments. This technology and design flexibility means we can develop adaptive and customer-oriented solutions that provide clear added product value and application benefits. With this, we support the entire process, from scratch. Starting with the first ideas, developing prototypes, running tests at end customer sites to finally find and produce the desired product. Together with our partners, our development team has completed a range of projects in radiology, radiation therapy, surgery and neonatology and we are happy to present our portfolio to you in person:

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## Literature

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