

## **Abstract**

### **Survival of Methicillin Resistant *Staphylococcus Aureus* on MRI diagnostic Table/Patient Positioners Pad Material**

#### **Purpose:**

The primary aim of this pilot study is to assess the survivability of MRSA on the surface and foam core of MRI scanner table pads and patient positioners in common use throughout the world. Due to the dangers posed by the active magnetic field generated by the MRI scanner, which is on at full strength 24 hours a day, strict limitations are required for access into the MRI suite. This usually precludes cleaning crews from entering and therefore cleaning the MRI suite. Additionally, as the table pads and patient positioners age they will often fray and/or tear, allowing MRSA to colonize the interior central foam core, where it is impossible to properly clean (ref CDC). These factors create an optimal environment for the prolonged survival of MRSA both on the surface and inside these pads, thus creating a possible vector for cross-contamination to future patients and a reservoir of bacteria.

#### **Materials & Methods:**

This study examined the table pads and patient positioners of two commonly used MRI manufacturers in order to obtain an indicative sample of the clinical setting. The pads were initially cultured to ascertain the environment of microbes living on the pads from previous use. It was determined that there were no observable populations on any of the samples obtained. Next, three 3cm squares of the external surface and internal foam of each manufacturer's pad were sectioned. The sections were then inoculated with equal pen tip sized amounts of MRSA and blood (50 ul). Eight weeks after the initial inoculation a punch biopsy needle was used to collect samples which were placed in a standard suspension of Trypticase broth and incubated at 37.5 C for 24 hours. From this suspension, a standard loop was used to streak each sample onto several blood agar plates and incubated for 48 hours at 37.5 C.

No animals or humans were used in the pilot study.

#### **Results/Discussion:**

A substantial colony growth was observed on all samples and confirmed as MRSA. The growth was similar between the pads of manufacturers as well as between the external and internal foam surfaces. Further sampling is to follow in order to determine the duration of the

MRSA survival on these pads.

Upon completion of the growth study, an additional experiment was performed to confirm the suspicion that one of the manufacturer's pads were porous for MRSA. The same protocol was repeated with the blood and MRSA inoculum applied to a 1 inch square of the external surface. The porous nature of this material was confirmed based on the colony growth present on the plate as a result of infiltration through the external barrier material. This underlies a critical issue of MRSA being introduced onto the surface of the pad and penetrating to the core, thus making the elimination of this bacterium virtually impossible short of complete replacement of the pad. Older and highly worn pads that are often torn and frayed allow this same infiltration into the core material.

### **Conclusions:**

This pilot study revealed in a laboratory setting, aggressive and long term growth of MRSA on the surface and foam core of MRI scanner table pads and patient positioners, with a relatively small amounts of biological material . The MRSA actively survive on the surface and foam core for at least eight weeks. Additionally, one manufacture's covering material were found to be porous allowing the MRSA to infiltrate through the external barrier material into the foam core.

Further study is needed to determine the extent of Infection Control implemented needed within the scanning rooms, and the current practices utilized to sanitize and remove biological material from the diagnostic pads and positioners . Further laboratory and clinical research is needed to determine the implications on patient safety and the role of MRI suites at hospitals and imaging centers in the spread of MRSA.