

## MRSA Alert: MRI Infection Creates New 'Superbug' Concerns

In 2006, 15-year-old Nile Moss underwent magnetic resonance imaging (MRI) as an outpatient in a southern California hospital. Subsequently, he developed a high fever and pneumonia caused by Methicillin-resistant *Staphylococcus aureus* (MRSA) bacteria. The "superbug" infection, apparently contracted from contaminated MRI equipment, did not respond to treatment, and Nile Moss died one day after being re-admitted to the hospital.

The case served to spotlight the ongoing problem of antibiotic-resistant infections in healthcare environments, including outpatient settings. According to the Centers for Disease Control and Prevention (CDC), MRSA causes approximately 19,000 deaths per year. One out of five patients who develops an invasive MRSA infection dies, a substantially higher rate than for conventional staph infections.

Antibiotic-resistant infections are also significantly more costly to treat than non-resistant infections. These expenses are often borne by the hospital, as recent Medicare regulations prohibit reimbursement for costs related to preventable facility-acquired conditions. (See the CNA HealthPro *AlertBulletin* 2008, Issue 3, "No-charge Policies: To Bill or Not to Bill for 'Never Events'," available at [www.cna.com](http://www.cna.com).) Clearly, MRSA has emerged as a major risk factor for all healthcare organizations, requiring a proactive response.

While standard precautions – including hand hygiene, gloving, gowning and use of personal protective equipment – are essential to infection control, they do not fully address the underlying environmental risk factors. This resource expands upon the CNA HealthPro *AlertBulletin* 2008, Issue 2, "Resist the Threat of MRSA Infections with These Precautions" (available at [www.cna.com](http://www.cna.com)), presenting additional strategies to combat MRSA bacteria wherever they appear, including inconspicuous and previously unsuspected locations.

### Basic Preventive Strategies

MRSA has proliferated partly due to the bacterium's ability to reside in "colonized" individuals who appear healthy. However, it can cause potentially fatal infection to those with open wounds or compromised immune systems. According to the CDC, 2.3 million Americans are asymptomatic MRSA carriers. This high prevalence,

combined with the germ's ability to survive long periods outside the body, make it difficult to eradicate.

Effective prevention requires a concerted effort both to detect colonized patients and staff, and to prevent the bacteria from spreading throughout the facility. This involves active surveillance of potential carriers, use of contact precautions when appropriate and an aggressive approach to environmental hygiene.

Implementing these preventive measures can bring "superbugs" under control. For example, in the United States, 70 percent of hospital-acquired infections are associated with antibiotic-resistant bacteria, according to the CDC. By contrast, in Danish hospitals, where contact precautions and active surveillance are vigilantly enforced, "superbugs" account for less than 1 percent of infections. A Norwegian hospital curbed a MRSA outbreak by screening staff and patients immediately after initial detection, implementing contact precautions for infected and colonized patients, and administering topical nasal treatments and germicidal body washes to affected individuals. In addition, colonized staff members were allowed to return to work only after three nasal samples tested negative.<sup>1</sup>

These examples illustrate the benefits of active surveillance. Hospitals should routinely perform cultures upon both potentially exposed staff members and patients with MRSA risk factors, including extended stays in healthcare facilities, long-term antibiotic use, underlying conditions that weaken immunity and invasive procedures, such as dialysis.

Patients who test positive for infectious agents should be cared for using contact precautions, including segregation from unexposed patients, frequent room cleaning and disinfection, and limited movement within the facility. For information on standard and contact precautions, access the CDC at [http://www.cdc.gov/ncidod/dhqp/ar\\_mrsa\\_healthcareFS.html](http://www.cdc.gov/ncidod/dhqp/ar_mrsa_healthcareFS.html).

1 Pyrek, K. "Stricter Precautions, Active Surveillance Can Beat MRSA and VRE." *Infection Control Today*, posted May 1, 2003. Available at <http://www.infectioncontrolday.com/articles/351feat1.html>.

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# AlertBulletin

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## **Advanced Environmental Hygiene**

Radiologist Peter Rothschild, MD, has devised an infection control checklist (available at [http://boles.com/called/08/MRI\\_infection\\_control\\_white\\_paper.pdf](http://boles.com/called/08/MRI_infection_control_white_paper.pdf)) for MRI suites, which also may apply to other outpatient settings. Dr. Rothschild advocates posting cleaning policies, procedures and schedules throughout the facility, and implementing the following hygiene measures, among others:

- **thorough hand washing and sanitizing** between examinations
- **cleaning the imaging table between uses**, as well as inside the bore of the magnet and other areas of patient contact
- **disinfecting pads and positioners** after each patient
- **inspecting pad seams and surfaces periodically with a magnifying glass** to detect wear and tear
- **checking pad material frequently with an ultraviolet light** to identify possible bacterial contamination
- **replacing old pads** with new, antimicrobial ones
- **covering pillows and furniture with waterproof material** that can be easily wiped clean

Dr. Rothschild's work serves as a useful reminder that drug-resistant microbes may propagate in tabletops and other exposed surfaces in healthcare providers' offices. To reduce MRSA-related risks, all patient contact areas must be disinfected after each encounter.

Other important environmental hygiene measures include

- **educating staff members and physicians about risks associated with commonly contaminated objects and areas**, including privacy curtains, supply closets, lab coats, computer keyboards, room telephones and remote control units
- **informing cleaning staff that soaking surfaces with detergent is more effective than spraying and wiping**, and emphasizing the necessity of thoroughly scrubbing walls, floors and surfaces
- **testing surfaces for bacteria on a regular basis**, as areas that appear outwardly clean may harbor dangerous microbes

## **Additional Safety Measures**

Within facilities, MRSA spreads largely via the hands of healthcare workers who have touched either exposed individuals or contaminated items or surfaces. The following strategies are designed to help break the cycle of infection:

**Enhanced hand hygiene.** Other infection control measures are ineffective without proper hand washing. Explain to all staff that MRSA spreads through cross-contamination of different body areas, which can be limited by scrubbing hands between tasks when caring for colonized and infected patients.

**Gloving and gowning.** Inform staff members that they must leave gloves and cover gowns in the rooms of exposed patients, and wash their hands immediately after removing gloves or touching the outside of their gowns. Also, ensure that all employees – including technicians and food service staff – know and follow glove and gown regulations.

**Dedicated use of non-critical equipment.** Blood pressure cuffs, stethoscopes and even EKG wires can harbor MRSA and other microbes. If this equipment cannot be limited to one patient or made disposable, it must be thoroughly cleaned and disinfected after each use.

**Regulated antibiotic use.** Overuse of antibiotics is a fundamental cause of the proliferation of MRSA and similar microbes. Restrained use of antibiotics (where medically indicated) and careful culturing of infection sites to determine appropriate treatment can help slow the spiral of bacterial drug resistance.

**Appropriate staff-patient ratios.** Lapses in infection control are often due to time pressures associated with understaffing. Staff members with manageable workloads are less likely to take shortcuts and make errors that could compromise safety.

Following Nile Moss's death, the California legislature enacted SB 1058, known as "Nile's Law," which mandates MRSA screening and infection reporting in hospitals. Similarly, the state of Washington recently enacted a law directing hospitals to test patients for MRSA following a risk assessment, and to report incidents of MRSA to the state Department of Health. At this point, numerous states require hospitals to report their infection rates, and other healthcare facilities may eventually face similar regulations.

In order to protect patients, comply with new state laws and minimize liability exposure, healthcare administrators should make reducing the incidence of MRSA a high priority.

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