MRSA in the Fire Station — A Striking Possibility

By Richard Barlette & Mitchell Associates Architects

MRSA, what is it, what is the impact if infected, why does it like to live in and around firefighters, and what can we do to control its spread?

What is MRSA: *Methicillin-resistant Staphylococcus aureus* is commonly referred simply as MRSA. It is a potentially dangerous type of staph bacteria that is resistant to certain antibiotics and can survive on hard surfaces for several days to several weeks. MRSA tends to appear first as a pimple, spider bite or boil that may be red, swollen and painful, and generally accompanied by pus or other drainage and fever. If undiagnosed, or left untreated, it can rapidly progress into widespread systemic infection. It can spread along soft tissue in as little as 2-3 days and can enter the bloodstream where it becomes difficult to treat. In 2010, MRSA infections resulted in 19,000 deaths a year in the United States.


Photo Credit: Gregory Moran, M.D.

Where it is found: Since firefighters and emergency medical providers live and move about the community freely, treating patients and frequenting hospitals and health care facilities, they can be exposed to both strains of MRSA, community acquired (CA) and hospital acquired (HA). MRSA can be passed from person to person and contracted from unclean, contaminated surfaces such as tables, chairs, couches, computer key boards, door handles, countertops, sinks and faucets. Because firefighters and emergency medical providers are working out among the community and are in frequent contact with high risk populations, they can easily transport infectious microbes back to the fire station on their hands, clothing, PPE and even apparatus. Fire stations, because of their operational make-up and communal living, can easily become a haven for MRSA.

Tucson Fire Department Study: A Tucson firefighter who initially thought he had a spider bite was diagnosed with contracting MRSA, prompting fire officials to take immediate action in finding a solution. A public health educator and University of Arizona researcher, Kelly Reynolds, sampled several fire stations and found the bacteria, prompting the department to revise its infection control protocol to include daily disinfection of all commonly used surfaces, lavatory, kitchen, lounge & administrative office areas.

Cleaning Requirements: While **NFPA 1581-** ***Standard for Fire Department Infection Control Program*** sets requirements for departments to have standard operating protocols to protect firefighters covering infection control, cleaning PPE and equipment, no cleaning requirement exists for cleanliness of fire stations. In order to limit bacterial pathogens, infections and MRSA in fire stations, **daily cleaning protocols** must be employed, utilizing EPA approved antimicrobial cleaning agents and disinfectants effective against MRSA.

Antimicrobial ingredients in building products: Along with the growing understanding of how important it is to address health concerns for first responders, there has been a recent increase in promotional materials in the emergency service marketplace advertising the possible benefits of specially formulated antimicrobial paints, carpets, and hardware. This interest in developing new materials may result in building product solutions in the future. At this time, according the **Centers for Disease Control and Prevention (CDC)**, the U.S. Food and Drug Administration (FDA), and Kaiser Permanente Health, after extensive review researchers are unable to find adequate evidence documenting health benefits attributed to the use of antimicrobial products. In fact, studies, including some by the CDC, conclude that overuse of such antimicrobial substances can contribute to stronger, resistant bacterial strains and in the long run may have a negative impact. Until more scientific evidence can offer guidelines for the effective use

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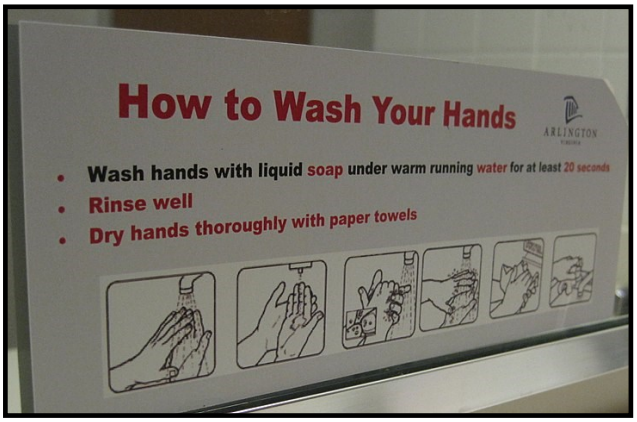
of specialty antimicrobial materials, **Mitchell Associates Architects will continue to rely on evidence-based approaches** to limiting the spread of infection in fire stations. This means we take the time to research manufacturers' antimicrobial claims and carefully select materials, construction details, and furniture designs that minimize the opportunities for these pathogens and pests to prosper in the station.

Health-Focused Fire Station Design: Mitchell Associates Architects has incorporated many features in their stations design for the health, safety, and wellbeing of the firefighters who staff and live in these facilities.

Administrative and communal living areas have **positive air pressure** compared with the apparatus bay to control diesel emission leakage and the spread of airborne contaminants.



According to the CDC, **hand washing is a simple and effective way to reduce MRSA's spread**. Accessible hand wash stations are strategically placed on the apparatus floor make it easy for firefighters to wash-up after a run and gear is stored.

Turn out gear (PPE) is cleaned and stored away from communal areas and bunk room. A specially designed, ventilated PPE storage limits air & odor contamination.

New station designs incorporate the best features of deconning PPE and equipment in compliance with NFPA 1581, including **large extractors, washers and dryers**, and preparation for emerging SCBA cleaning equipment.

Post-incident entry to building can **directly lead into decon areas** where personnel & equipment can be cleaned.

Stainless steel surfaces, which make MRSA difficult to adhere to, are replacing the more porous kitchen counters and tables. **Hard surface flooring** is replacing carpeting, and fabric covered furniture, which more easily harbors MRSA bacteria, is being replaced with **cleanable material** with seaming to minimize locations to harbor bacteria. We are recommending mattresses with ultrasonically welded, not sewn seams.

MRSA is a problem for today's fire service and requires a **commitment to change**: change in design criteria, change in daily operations and changing attitudes and behavior towards cleanliness in the fire station.

NOTE: Mitchell Associates Architects, MAA has undertaken the review of many reports, studies, and published articles pertaining to MRSA and its spread in order to better inform our own practice. We share this information with the emergency response community as informational only.