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Copper linked to reduction in bacteria found in hospitals

Early results of MUSC study: Copper surfaces good at killing bacteria such as MRSA

Charleston, S.C. (April 5, 2010) – One of the most frustrating problems facing hospitals is how to prevent health care-acquired infections. Exposure to organisms often found in hospital environments, such as intensive care unit (ICU) rooms, can result in additional illness and sometimes death for people who come into contact with these “bugs”.

Recent clinical tests at the Medical University of South Carolina (MUSC), the Ralph H. Johnson VA Medical Center, and Memorial Sloan-Kettering Cancer Center in New York City, demonstrated that antimicrobial copper is effective in significantly reducing the bacterial load in intensive care unit (ICU) patient rooms and on many individual objects in those rooms.

Michael Schmidt, Ph.D., MUSC Professor and Vice Chairman of the Department of Microbiology and Immunology said, “It’s well known that hospital-acquired infections have a high cost, both in terms of money spent treating them and lives lost. One in 20 hospital patients will develop a hospital-acquired infection; that number increases to 30 percent for patients in intensive care units.”

The ongoing U.S. Department of Defense-funded clinical trial is assessing the ability of antimicrobial copper to reduce the amount of bacteria on surfaces commonly found in hospital rooms. Early results from the second phase of the study indicate that antimicrobial copper may be the key to reducing these sometimes deadly infections. Copper was effective in significantly reducing the total bacterial load in ICU patient care rooms and on many individual objects within those rooms.

“The concentration of aerobic colony forming units on a hospital surface that is commonly accepted as benign is less than 5 cfu/cm²,” Schmidt said. “When the inherent microbial burden on objects exceeds this level, it is likely that transmission increases among patients, health care workers, visitors and the objects within the built hospital environment. Surveillance studies have found the majority of the common objects with which health care workers, patients and visitors routinely interact carry a substantial microbial burden and thus represent a clear and present danger to patients even in spite of the best efforts to keep the objects clean.”

During the first phase of the study, investigators determined that the most heavily contaminated objects are those closest to the patient, such as bed rails, call buttons, and visitor chairs. Bacteria such as *Staphylococcus aureus*, methicillin resistant *Staphylococcus aureus*, (MRSA) and vancomycin-resistant *enterococci* (VRE) can survive for long periods of time on contaminated surfaces, so it’s important to find materials which make it more difficult for these bacteria to spread to patients, visitors and health care workers. In the second phase of the trial, copper bed rails, tray tables, chair arms, call buttons, monitors and IV poles replaced their counterparts in ICU rooms of the three participating hospitals.

Laboratory testing independent of the clinical trial has proven that copper and copper alloys, such as brass and bronze, kill 99.9 percent of bacteria within two hours, when cleaned regularly and as a supplement to routine cleaning and disinfection programs.

Schmidt said, "Initial analysis of data from our studies assessing the consequences of introducing the copper into the built environment have clearly shown that the antimicrobial properties of copper have substantially, and consistently, kept the microbial burden associated with commonly encountered objects to levels well below those considered to represent a risk to patients. In fact, when considered as an average, the concentration of the microbes found on the copper objects sampled never exceeded levels deemed benign. We are now asking whether or not such a substantial reduction in burden will translate into a reduction in health care-acquired infections."

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About MUSC

Founded in 1824 in Charleston, The Medical University of South Carolina is the oldest medical school in the South. Today, MUSC continues the tradition of excellence in education, research, and patient care. MUSC educates and trains more than 3,000 students and residents, and has nearly 11,000 employees, including approximately 1,500 faculty members. As the largest non-federal employer in Charleston, the university and its affiliates have collective annual budgets in excess of \$1.7 billion. MUSC operates a 750-bed medical center, which includes a nationally recognized Children's Hospital, the Ashley River Tower (cardiovascular, digestive disease, and surgical oncology), and a leading Institute of Psychiatry. For more information on academic information or clinical services, visit www.musc.edu. For more information on hospital patient services, visit www.muschealth.com.