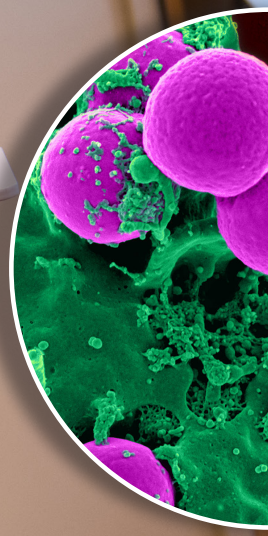
Antimicrobial Copper and... *Methicillin-resistant Staphylococcus aureus (MRSA)*



Name of Study: Potential use of copper surfaces to reduce survival of epidemic methicillin-resistant Staphylococcus aureus in the healthcare environment

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Methicillin-resistant *Staphylococcus aureus* (MRSA) is a bacterium that is resistant to many antibiotics. The first reported strain of MRSA was isolated in England in 1961. Although its prevalence declined in the 1970s, it re-emerged in the early 1980s in the form of epidemic MRSA (EMRSA) with EMRSA-15 and EMRSA-16 being the most prevalent strains. This study evaluated the antimicrobial activity of copper surfaces against MRSA and EMRSA.

Key findings:

- On pure copper surfaces at 22 °C, inoculations of MRSA, EMRSA-1 and EMRSA-16 were completely killed after 45 min, 60 min and 90 min, respectively. At 4 °C, complete kill was achieved on pure copper for all three strains within six hours.
- In contrast, viable organisms for all three strains were detected on stainless steel (grade 304) after 72 hours at 22 °C. The results demonstrate an antimicrobial effect of copper on MRSA, EMRSA-1 and EMRSA-16 in contrast to stainless steel.
- Results for brass (80% Cu) at 22 °C are still significant with regards to viability reduction, although not to the same extent as those for pure copper. Complete kills were achieved for MRSA and EMRSA-1 after 4.5 hours of exposure, with both strains producing similar viability curves over time. The effect of brass on EMRSA-16 viability was less than a 100-fold reduction over six hours.

MRSA Facts:

What is it?

- Epidemic MRSA is defined as MRSA isolated from two or more patients in at least two hospitals. This first epidemic strain, designated EMRSA-1, was recognized in 1981 and continued to cause outbreaks in hospitals until the late 1980s.
- EMRSA-15 and EMRSA-16 are highly transmissible and durable. They gained a reputation as 'super' EMRSA. They are the most prevalent strains found in the UK and have also been found in a number of European countries as well as the U.S.A.

How is it contracted?

- According to the Centers for Disease Control and Prevention (CDC), anyone can get MRSA through contact with an infected wound or from contaminated hands, usually those of health care workers (HCWs).
- According to the authors of the study, hand hygiene remains the single most effective strategy for preventing cross-contamination via HCWs. However, door handles and commonly touched surfaces may be important secondary reservoirs for cross-contamination between HCWs and patients.
- People who carry MRSA may not show any signs of infection, but can easily spread the bacteria to others and potentially cause an infection.

Where is it prevalent?

- According to the CDC, one in three (33%) people carry staph in their nose, usually without any illness. When it comes to MRSA, two in 100 people carry the bacteria.
- MRSA infections occur both in communities and healthcare facilities. In communities, MRSA most commonly causes skin infections. While in medical facilities, MRSA can cause life-threatening bloodstream infections, pneumonia and surgical site infections.

Copper Facts:

This study was performed because copper alloys have previously been shown to be effective antimicrobial surfaces against a range of bacteria, fungi and viruses. A U.S. based study revealed that the use of copper surfaces in hospital rooms can reduce the number of healthcare-acquired infections (HAIs) by 58 percent. Six highly touched objects – bed rails, over-bed tables, chair arms, call button, computer accessories and IV poles – found in ICU rooms at three U.S. hospitals were retrofitted with copper touch surfaces for the study.

Brief synopsis of methodology:

Inoculations of MRSA and EMRSA were made onto copper, brass and stainless steel coupons. The inoculations consisted of 10^7 colony-forming units (CFUs) onto coupons with dimensions of 1 cm by 1 cm. The inoculated coupons were then incubated at either 22 °C or 4 °C for various time periods.

To download the full study, visit http://goo.gl/RNl2y5.

This is part of an ongoing series designed to educate the public about individual studies conducted with copper and explain its ability to inactivate or kill bacteria, viruses and fungi. To learn more about copper, visit www.antimicrobialcopper.com or www.copper.org.

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