



KEY POINT SUMMARY

OBJECTIVES

To assess whether or not copper coating is effective for reducing colonization of MDROs in an ICU setting.

Reduction of environmental contamination with multidrug-resistant bacteria by copper-alloy coating of surfaces in a highly endemic setting

Souli, M., Antoniadou, A., Katsarolis, I., Mavrou, I., Paramythiotou, E., Papadomichelakis, E., ... & Armaganidis, A. 2017 | *Infection Control & Hospital Epidemiology*. Volume 38, Issue 7, Pages 765-771

Key Concepts/Context

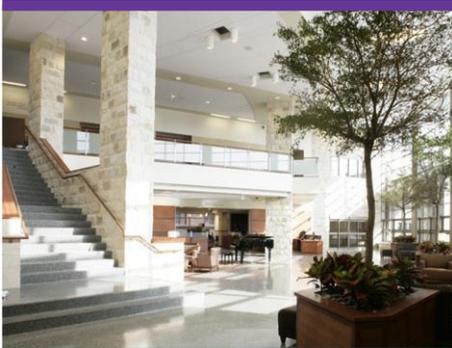
Healthcare-associated infections (HAIs) are often caused by multidrug-resistant organisms (MDROs). This is especially problematic in intensive care units (ICUs) due to the vulnerable nature of both patients and staff in these environments. Many previous studies have confirmed that copper has bactericidal capabilities, prompting the need for further studies into how copper can be applied in healthcare settings to reduce rates of infection.

Methods

Phase 1 of the study involved assessing the microbial burden of different ICU surfaces prior to applying copper coatings. Phase 2 was broken into two parts: during 2a, copper-coated items were situated next to regular items in two different rooms (compartments A and B), and during phase 2b, all copper-coated items were moved to compartment A while all normal items were moved to compartment B. Patients were assigned to random beds throughout the process. Environmental samples were gathered regularly throughout phase 2, and relevant patient information was collected from medical records.

Findings

Equipment coated in copper alloy saw a significant reduction in overall colonization (55.6% versus 72.5%). There were also reductions in surfaces colonized by MDR gram-negative bacteria (13.8% versus 22.7%) as well as by enterococci (4% versus 17%), the total bioburden (2,858 versus 7,631 cfu/100cm²), and the bioburden of gram negative-isolates (261 versus 1,266 cfu/100cm²). Reduction in MDROs was



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noticeably more pronounced when patients were surrounded by a higher number of copper-coated objects.

Limitations

The authors note a few limitations in this study. Only one institution was involved throughout the study, and the rate of patient colonization was not assessed. Coated and uncoated beds were not randomized, and no analysis of cost-effectiveness was included.

Design Implications

Applying copper coating to ICU surfaces such as side rails on beds, IV pole stands, hand soap dispensers, and cart handles can drastically reduce the presence of infection-causing bacteria within healthcare environments. This effect increases in relation to the amount of copper-coated objects present in a given space. Designers should consider applying copper coatings to frequently touched surfaces within areas that are prone to harboring infectious bacteria.

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