



## KEY POINT SUMMARY

### OBJECTIVES

To determine whether objects featuring copper alloy surfaces help reduce the risk of HAI in ICUs.

### DESIGN IMPLICATIONS

The continuous antimicrobial effect of copper on environmental pathogens makes it highly effective in mitigating the spread of HAIs. Designers could consider coating surfaces that are frequently touched with copper alloys to introduce a passive yet highly effective method for reducing hospital-wide HAI risks.

## Copper surfaces reduce the rate of healthcare-acquired infections in the intensive care unit

Salgado, C. D., Sepkowitz, K. A., John, J. F., Cantey, J. R., Attaway, H. H., Freeman, K. D., ... & Schmidt, M. G. 2013 | *Infection Control and Hospital Epidemiology*. Volume 34, Issue 5, Pages 479-486

### Key Concepts/Context

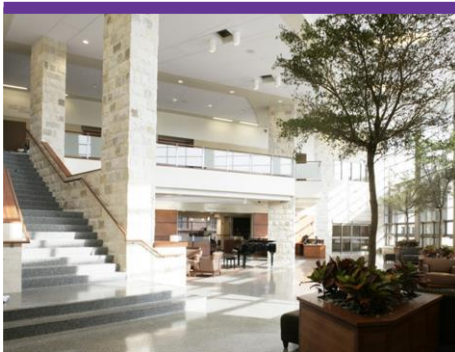
Hospital-acquired infections (HAIs) have been known to substantially increase patient morbidity and mortality, while also creating considerable financial burdens on patients and healthcare providers. Patients in intensive care units (ICUs) are at higher risk for HAI due to the nature of the ICU environment. Metallic copper surfaces have been known to substantially reduce bacterial concentrations; however, the clinical efficacy of these surfaces in ICUs has not been previously measured.

### Methods

Three different hospitals of similar sizes and with similar cleaning protocols were selected for the study. Bed rails, intravenous poles, overbed tables, nurses' call buttons, computer mouse devices, and visitors' chair arms equipped with copper alloy surfaces were introduced to ICU study rooms in each hospital in order to measure rates of HAI and/or VRE or MRSA colonization in these spaces. Corresponding control rooms in each hospital with no copper objects were also observed for comparison. A total of 614 patients were treated in these spaces during the study.

### Findings

Patients admitted to copper-equipped rooms developed significantly lower rates of HAI and MRSA/VRE colonization in proportion to those admitted to non-copper rooms. No differences were found between the types of HAIs that occurred among patients in both room types. Overall, it was found that placing a copper alloy surface onto six often-touched surfaces in ICU rooms reduced the risk of HAIs by more than half in all study sites. The continuous effectiveness of the copper's antimicrobial



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activity suggests that the material functions well in tandem with standard infection prevention practices.

**Limitations**

The authors note a few limitations within this study. Since objects were occasionally moved from rooms during care procedures, all six copper objects were not always present in copper rooms. 13.4% of patients assigned to non-copper rooms were exposed to some copper objects. The study design did not allow for the analysis of the effect of tarnishing and soiling the copper materials.

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