Antimicrobial Copper Touch Surfaces:
A new tool for Infection Control and Prevention

Wilton Moran
Project Engineer
Copper Development Association

The Science Behind the Technology Digital Summit
Infection Control Today

Copper Development Association Inc.
Copper Alliance

Antimicrobial Copper

Agenda

- The need for antimicrobial surfaces
- Antimicrobial efficacy of copper touch surfaces
- Products that incorporate copper touch surfaces
- Clinical testing

Antimicrobial Copper touch surfaces offer a powerful new infection-prevention tool. They work 24/7 to eliminate the bacteria that cause healthcare-acquired infections without staff behavioral changes. They are a one-time cost that provide long-term benefits.

Copper Development Association

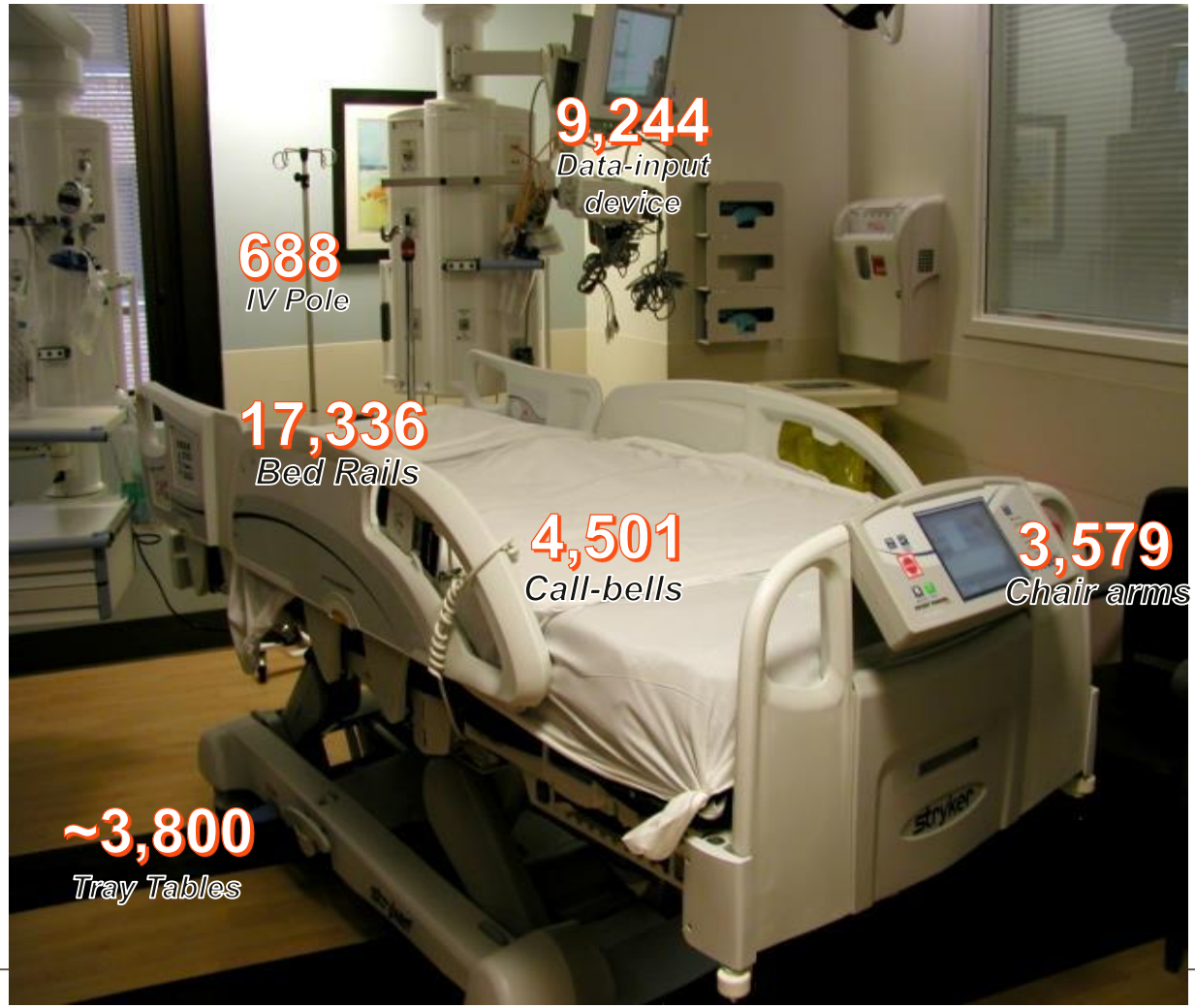
- Not-for-profit trade association
- Develop new uses for copper and it's alloys
- Provide education and training to end-users
- www.Copper.org, www.AntimicrobialCopper.com

Cu Copper Development Association Inc.
Copper Alliance

The Need for Antimicrobial Surfaces

The built environment is a source of pathogens

Total bacteria count per 100 cm² (n = 668 rooms)

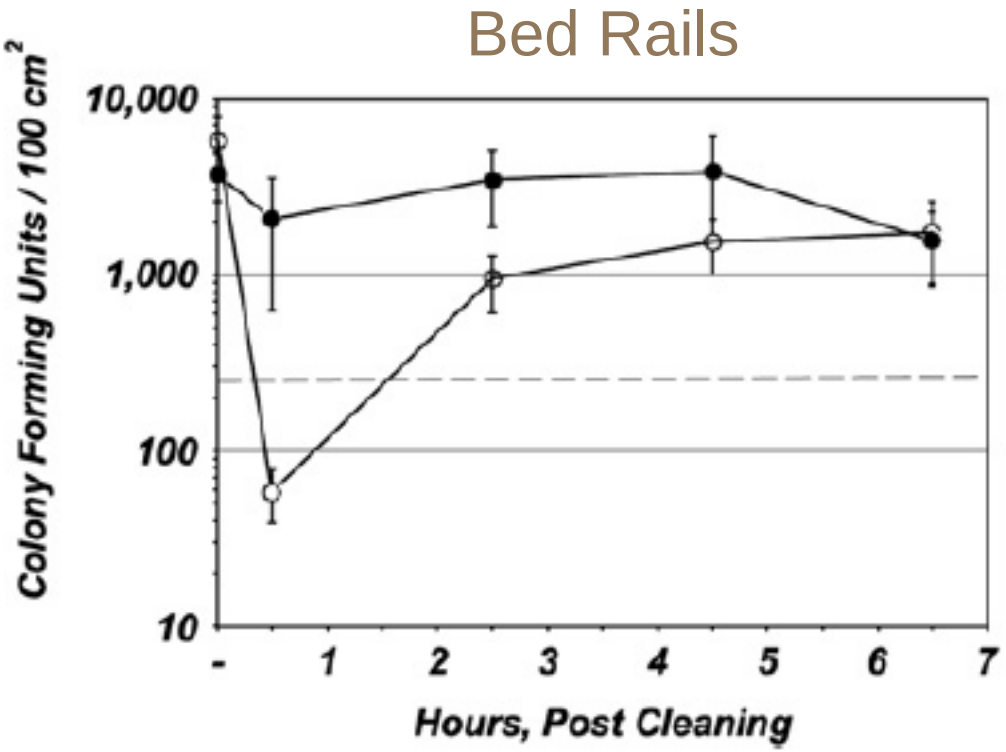


Schmidt et al. "Sustained reduction of microbial burden on common hospital surfaces through introduction of copper" J. Clin. Microbiol. 2012, 50(7):

Antimicrobial Copper Cu+

Good hygienic practices are essential – but the benefit is NOT CONTINUOUS

Surfaces are quickly re-contaminated after cleaning



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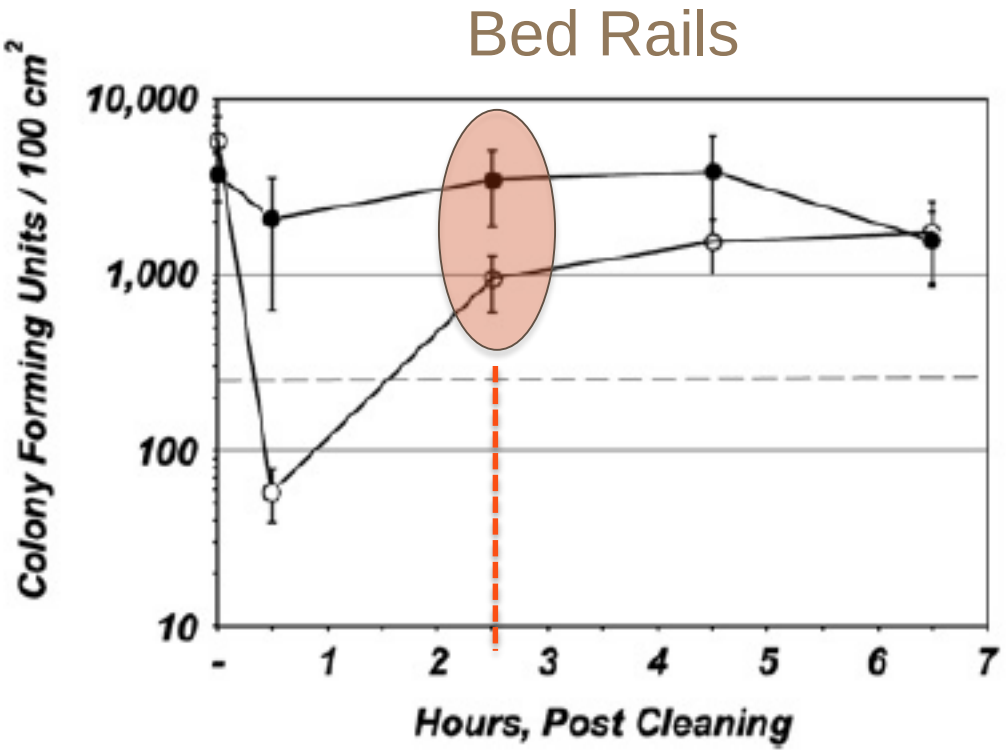

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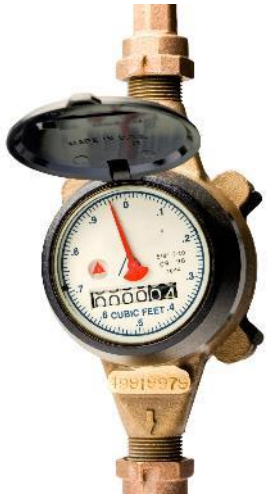
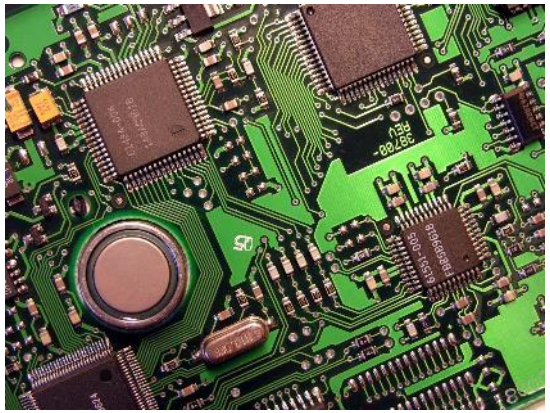
Copper is an inherently antimicrobial element, civilizations have benefited from these properties for centuries

Long before the germ theory of disease was developed, civilizations used copper to kill disease-causing organisms.




Copper is the third most important group of commercial metals behind iron/steel and aluminum





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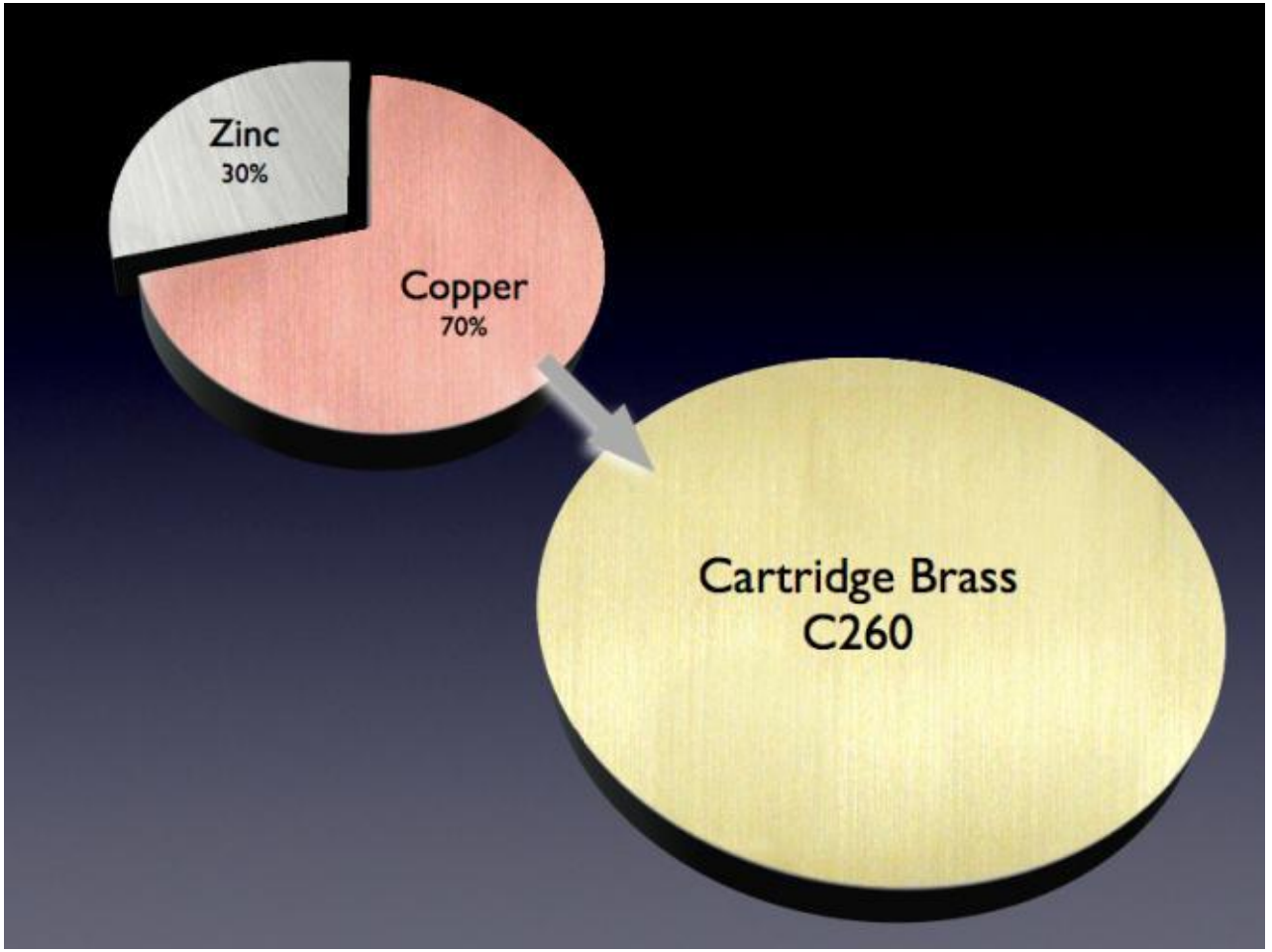
U.S. coinage are made of copper alloys

Copper Alloys



Antimicrobial Efficacy of Copper Alloys

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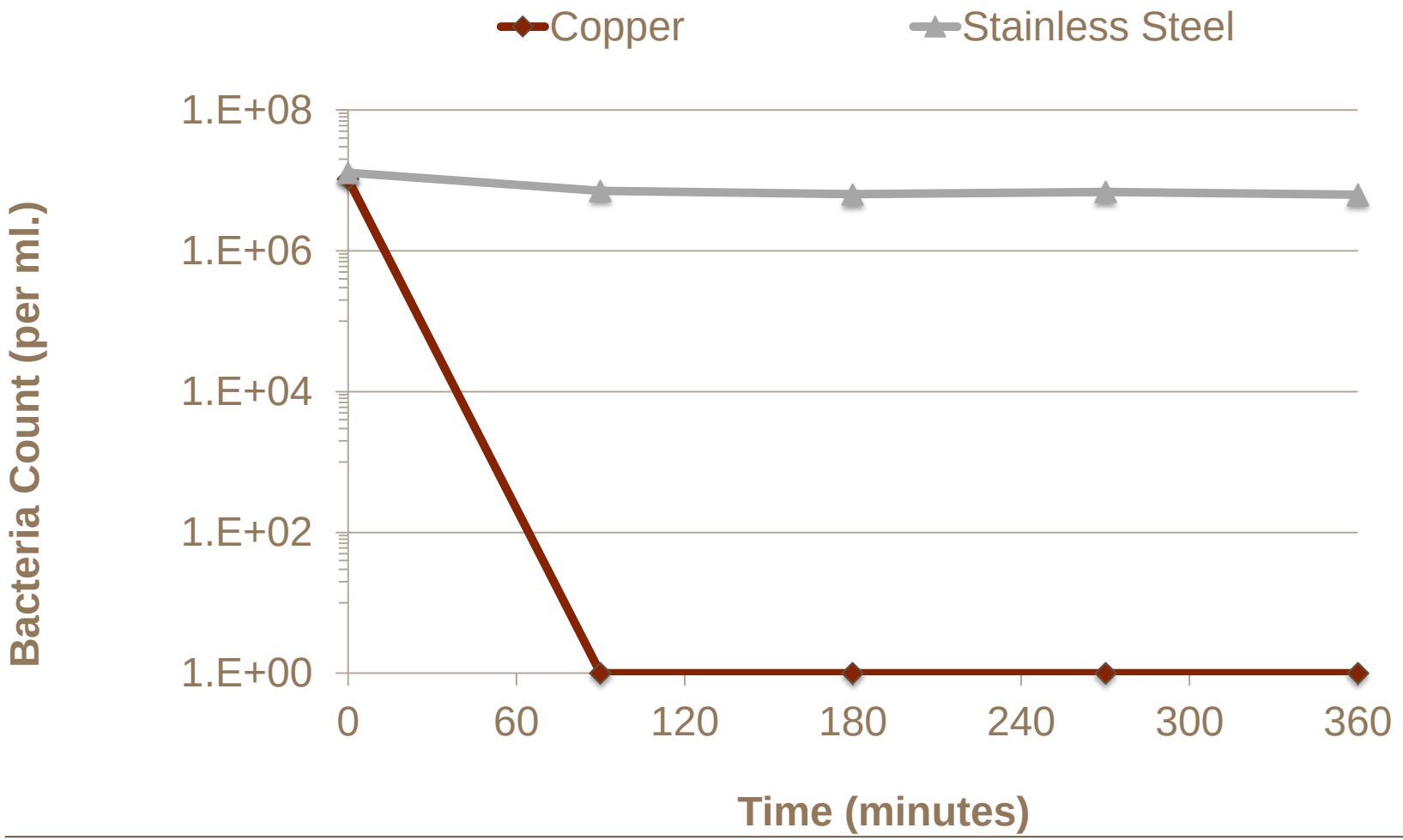
Antimicrobial Copper touch surfaces have broad spectrum antimicrobial efficacy

- ***Clostridium difficile***
- Carbapenemase-producing gram negatives including **CRE**
- Vancomycin-*resistant enterococcus*
- Norovirus
- *Acinetobacter baumanii*
- *Fusarium solani*
- Rotavirus
- Rhinovirus
- *Mycobacterium tuberculosis*
- **Influenza A (including H1N1)**
- **MRSA**
- *Aspergillus fumigatus*
- *NDM-1 producing K. pneumoniae*
- *Salmonella enteric*
- *Salmonella Typhi*
- *Vibrio cholerae*
- *Campylobacter jejuni*
- *Penicillian chrysogenum*
- *Candida albicans*

And more…

Antimicrobial Copper kills Methicillin-Resistant *Staphylococcus aureus* (MRSA)



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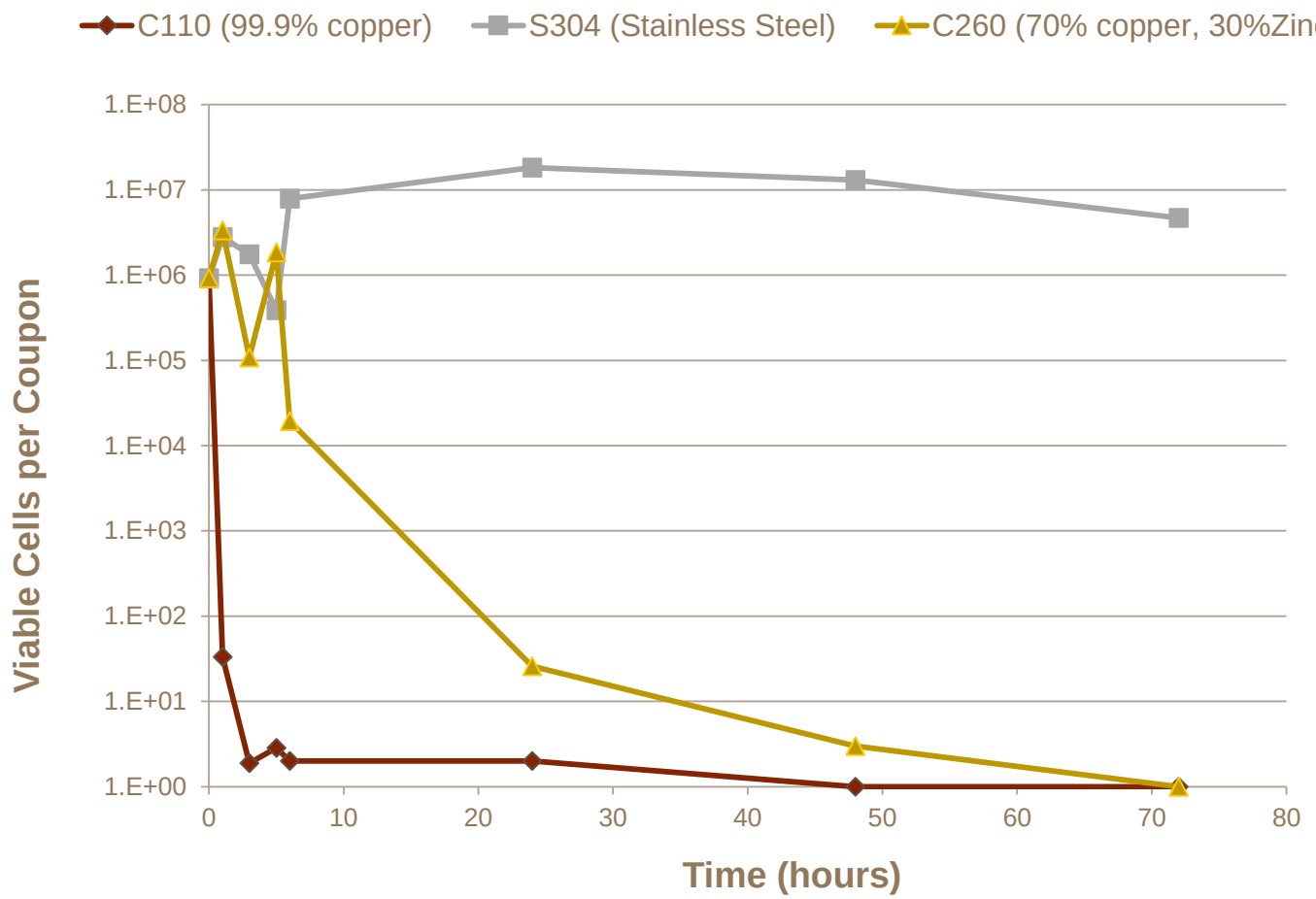
Antimicrobial Copper kills *Clostridium Difficile spores*

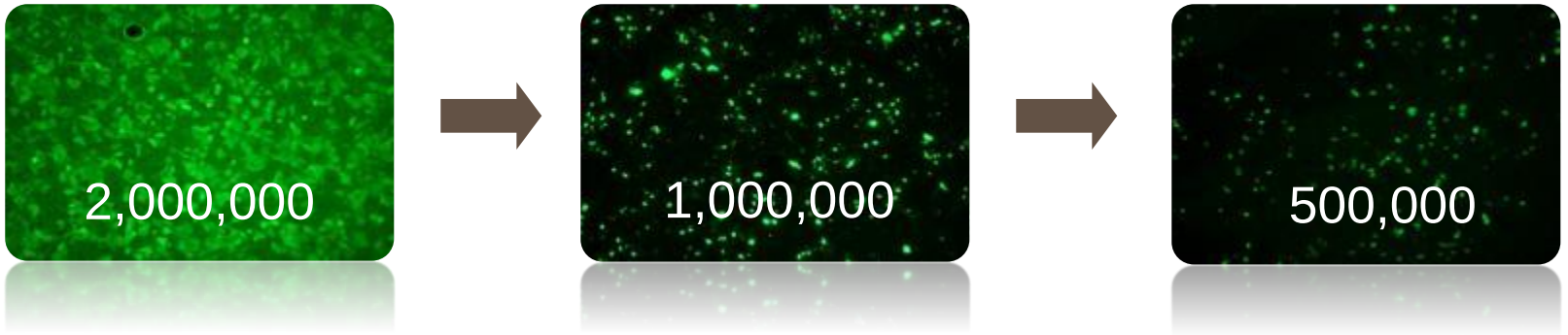


WEAVER, et al. 2008. Survival of Clostridium difficile on copper and steel: futuristic options for hospital hygiene. J Hosp Infect. 68, 145-51.

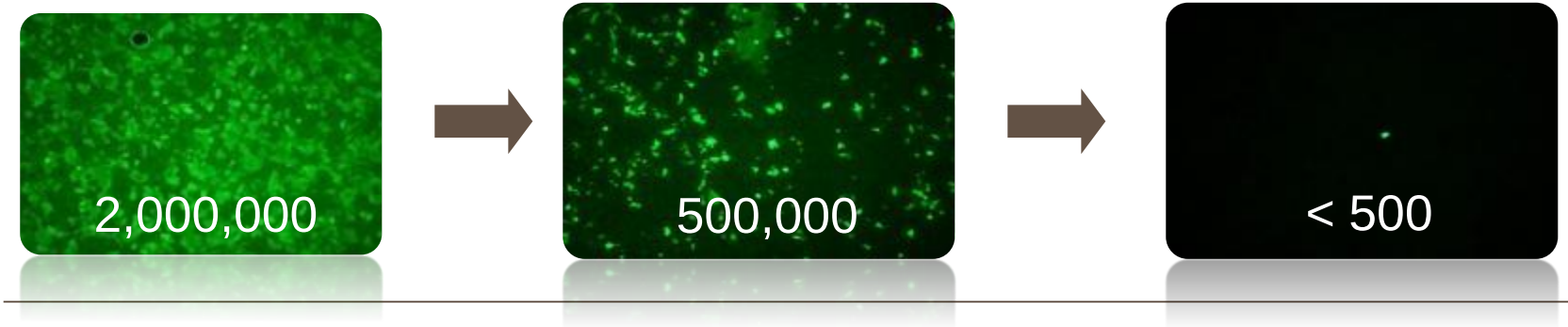
Antimicrobial Copper Cu+

Antimicrobial Copper surfaces inactivate Influenza A

Stainless Steel Samples: 6 hours



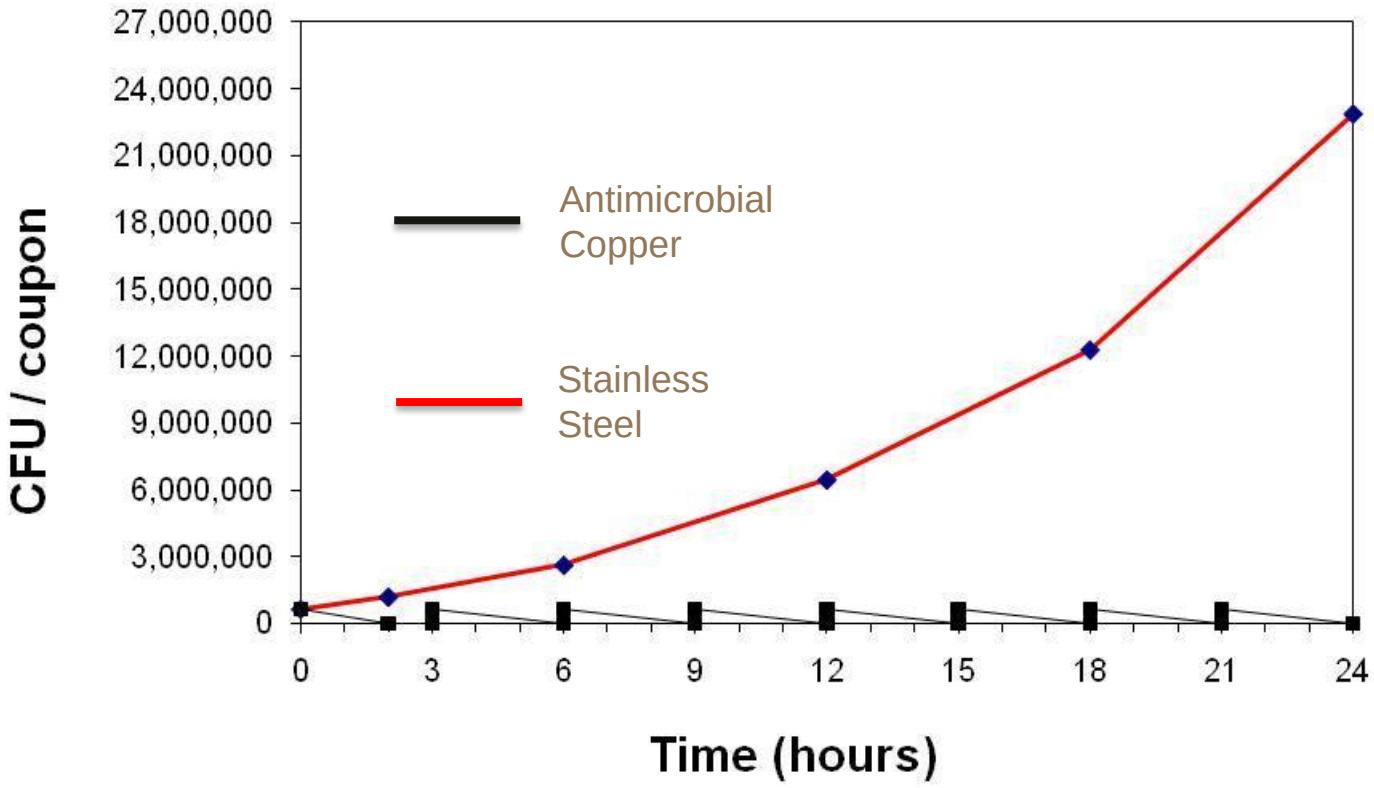
Antimicrobial Copper (99.9%) Samples: 6 hours



NOYCE, et al. 2007. Inactivation of influenza A virus on copper versus stainless steel surfaces. *Appl Environ Microbiol,* 73**,** 2748-50.

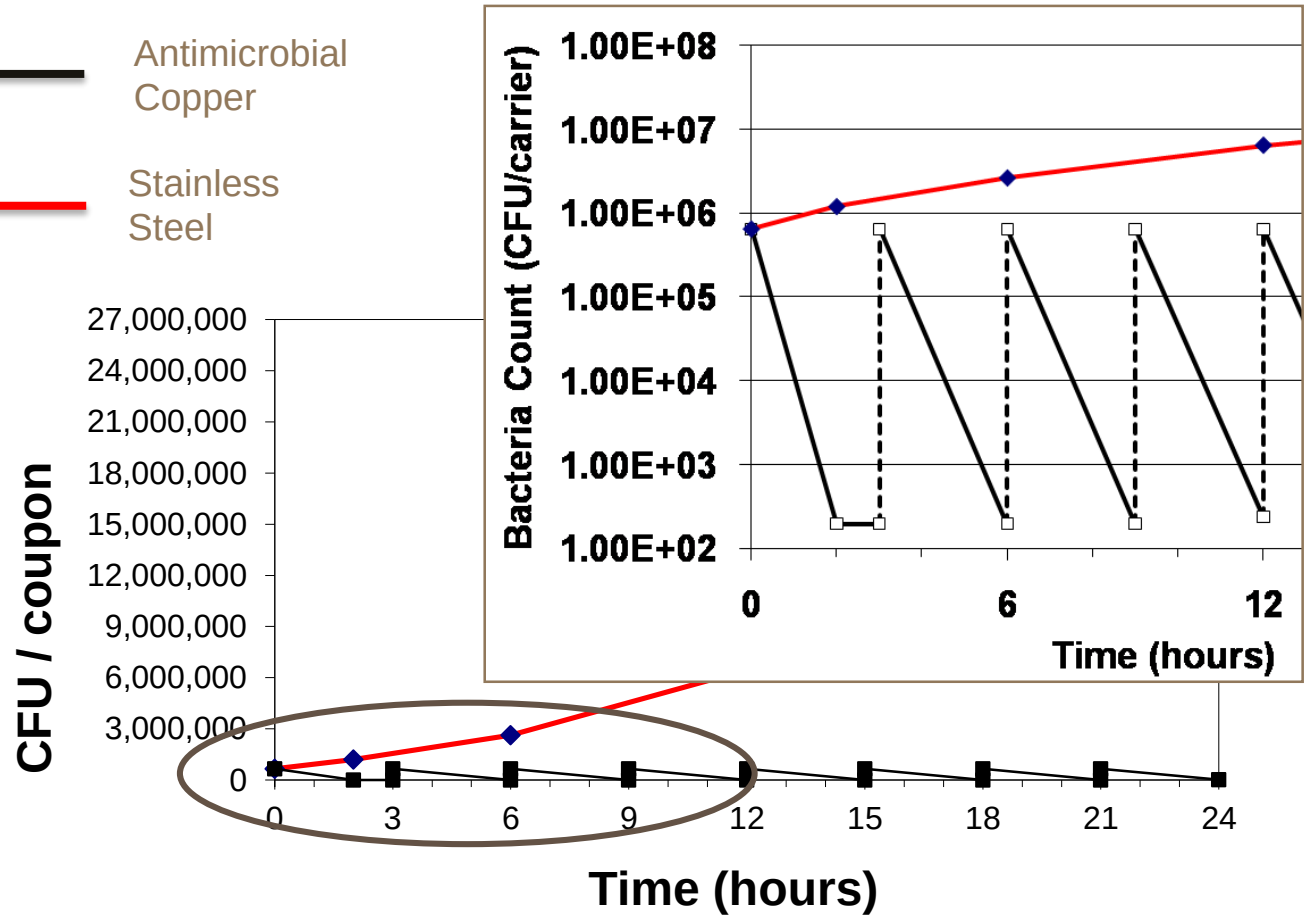
Antimicrobial Copper Cu+

Copper surfaces continuously kill MRSA and other bacteria, after repeated contaminations between routine cleaning



8 Inoculations Total

Copper surfaces continuously kill MRSA and other bacteria, even after repeated contaminations



Antimicrobial Copper's Efficacy vs MRSA

Antimicrobial Copper Cu+

Antimicrobial Copper has been approved by the EPA to make public health claims against 6 infectious bacteria

Staphylococcus aureus

Enterobacter aerogenes

Escherichia coli O157:H7

Pseudomonas aeruginosa

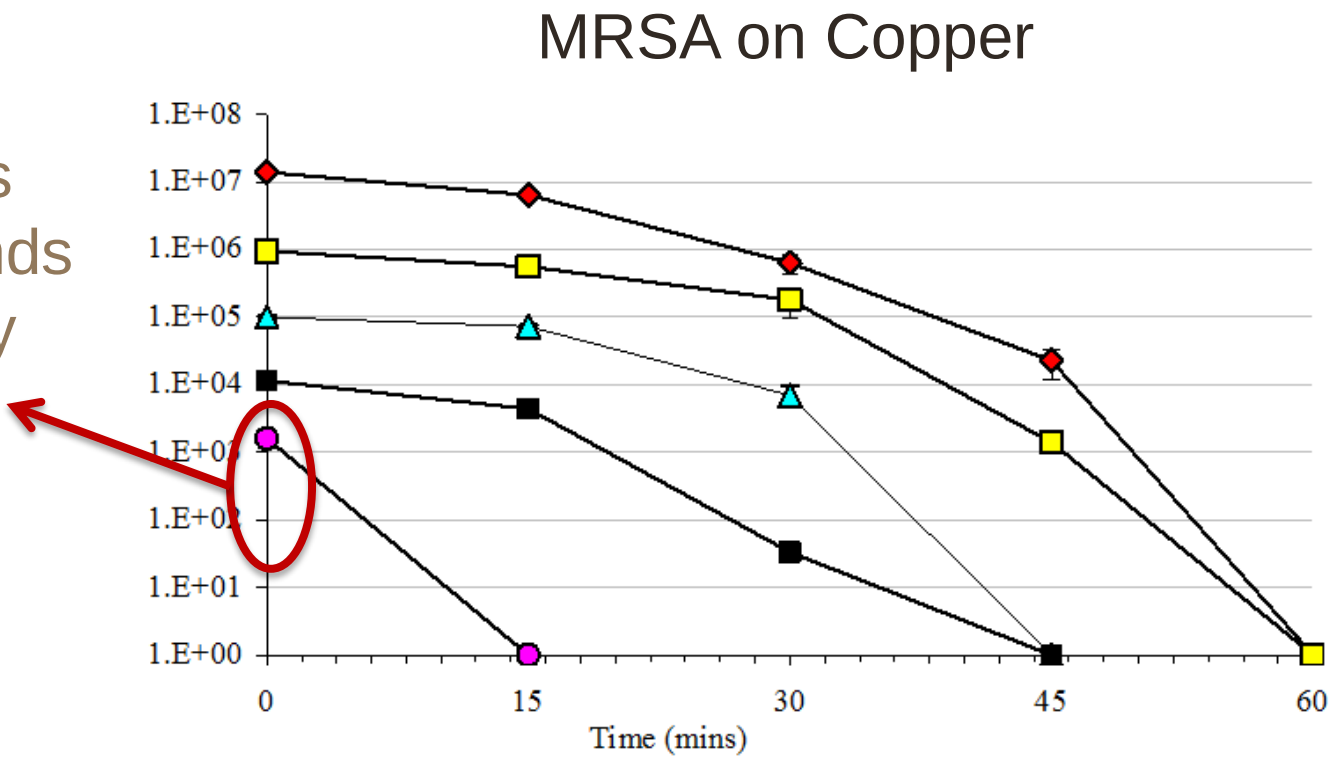
Methicillin-Resistant *Staphylococcus aureus* (MRSA)

Vancomycin-Resistant *Enterococcus faecalis* (VRE)

EPA Registration No. 82012-1 to 6

Smaller amounts of bacteria are killed much faster on Antimicrobial Copper

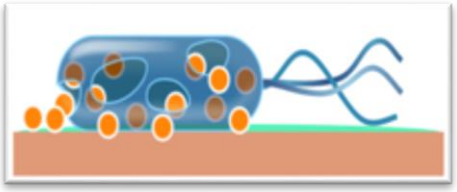
Typical levels found on hands and everyday objects



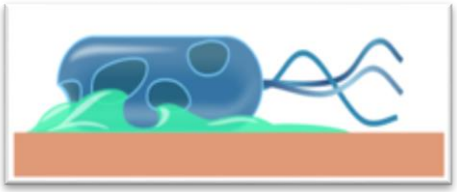
Michels et al, *Int. J. Metalcast*, 2008

How does copper kill bacteria? Several theories have been confirmed, others are being investigated

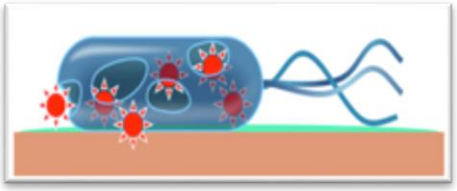
One proven theory



A: Copper ions on the surface are recognized as an essential nutrient, and enter the cell



B: A lethal dose of copper ions interferes with normal cell functions and membrane integrity



C: Copper ions impede cell respiration/metabolism, sometimes causing DNA damage

80+ Peer-Reviewed & Published Papers

Available Antimicrobial Copper Products

Sinks

Hand wash stations, scrub sinks

Manufacturers: Just Manufacturing, Elkay Commercial Products, MD-Cu29

IV Poles

Manufacturers: Pedigo, Midbrook Medical

Patient Transport

Manufacturer: Pedigo

Railings and Grab Bars

Manufacturers: Wagner Companies, Rocky Mountain Hardware, CuSalus by Colonial Bronze

Building Products

Manufacturers: Arrowhart, CuSalus by Colonial Bronze, Rocky Mountain Hardware, MD-Cu29

Work Surfaces

Manufacturers: Midbrook Medical, CuSalus by Colonial Bronze,

Work Surfaces

Manufacturers: Midbrook Medical

Building Hardware

Manufacturers: Rocky Mountain Hardware, CuSalus by Colonial Bronze, Trimco

Cabinet Hardware

Manufacturers: CuSalus by Colonial Bronze, Rocky Mountain Hardware, MD-Cu29

Cabinet Hardware

Manufacturers: CuSalus by Colonial Bronze, Rocky Mountain Hardware, MD-Cu29

Equipment/Cart Handles

Manufacturers: CuSalus by Colonial Bronze

Keyboards/Mice

Manufacturers: Operator Interface Technology

Door Access Device

Manufacturer: The Copper Shark

Check back often for additional product categories

AntimicrobialCopper.com

Infection prevention is a multifaceted challenge

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Copper will work in the background, 24/7, - install it and forget it!

Clinical Testing of Antimicrobial Copper

Multi-site clinical trial tested the impact of Antimicrobial Copper on patient health

- Funded by the Department of Defense
- CDA provided materials procurement support
- Trial at three sites:

Numerous surfaces were tested, but due to budget constraints only 6 were selected

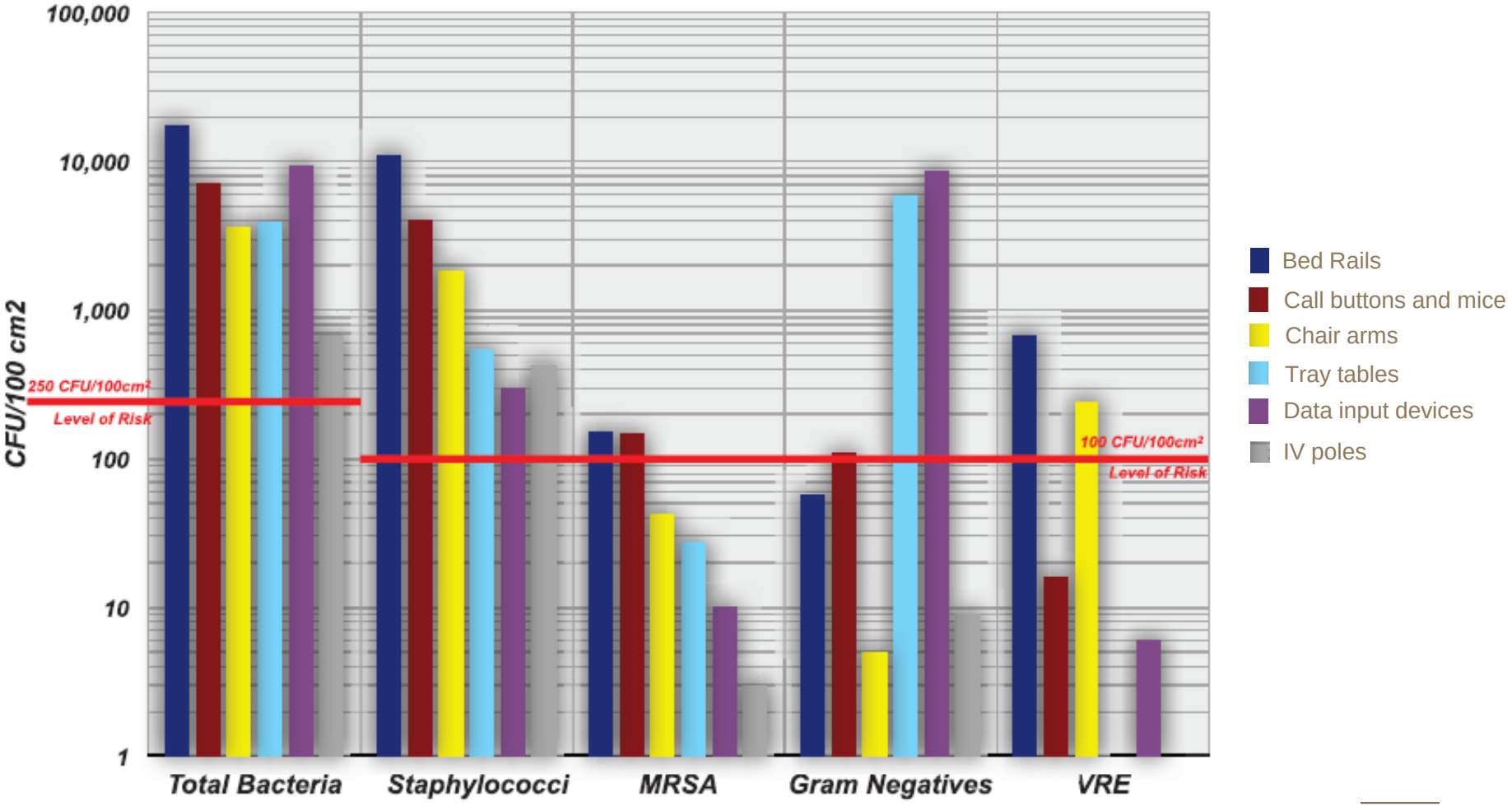
Surfaces Selected

- Bed rails
- IV stands
- Over-bed tray tables
- Data input devices (mouse, laptop, touch screen monitor bezel)
- Visitor's chair (arms)
- Nurses' call device

Surfaces Screened but not Selected

- Laundry hamper
- Door handles
- Drawer pulls
- Faucet handles
- Keyboards
- Soap/EtOH dispenser
- End table surface

Bed rails, data input devices, call buttons, - dirtiest touch surfaces in ICU rooms



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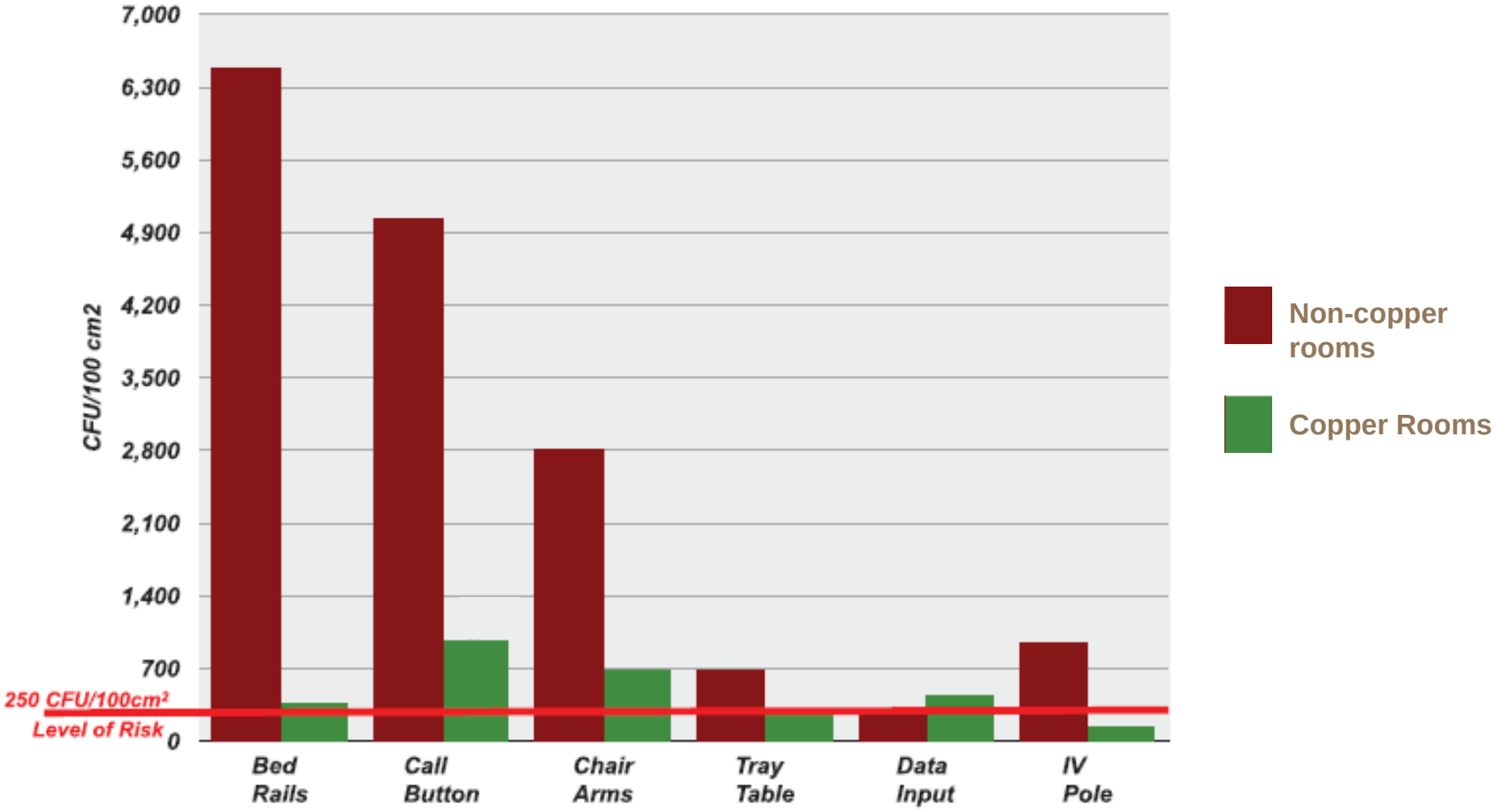
Antimicrobial Copper Cu+

Total bacteria was reduced by 83% in rooms with copper touch surfaces



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Antimicrobial Copper Cu+

Use of copper touch surfaces decreased the risk of HAI by 58%

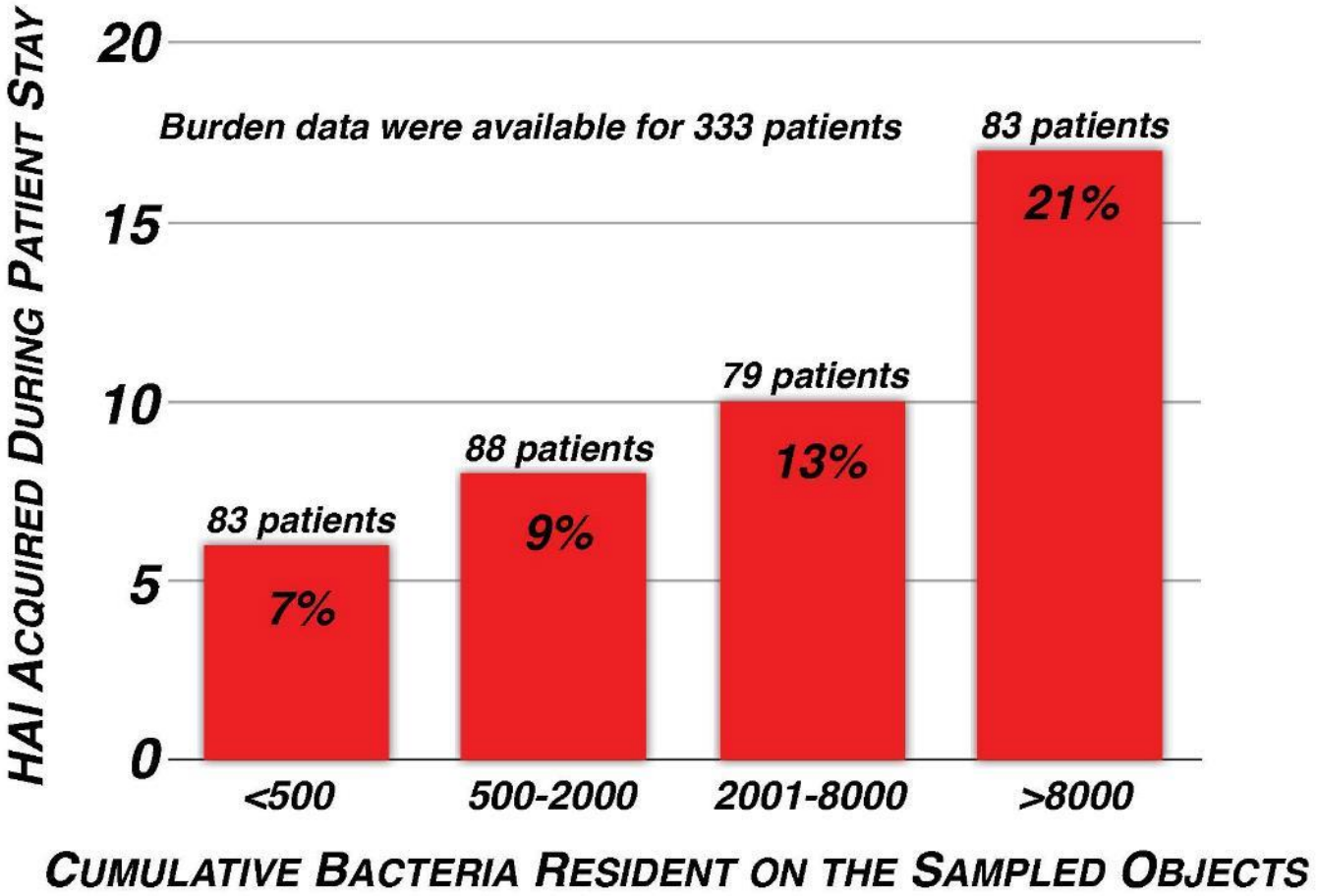
Copper room infection rate: **3.4%**

Control infection rate: **8.1%**

58% reduction, (P=0.013, N=614)

Salgado et. al. "Copper surfaces reduce the rate of healthcare-acquired infection in the intensive care unit" Infection Control and Hospital Epidemiology, Vol. 34, No. 5, May 2013, pp. 479-486

Bacterial contamination on surfaces leads to infections



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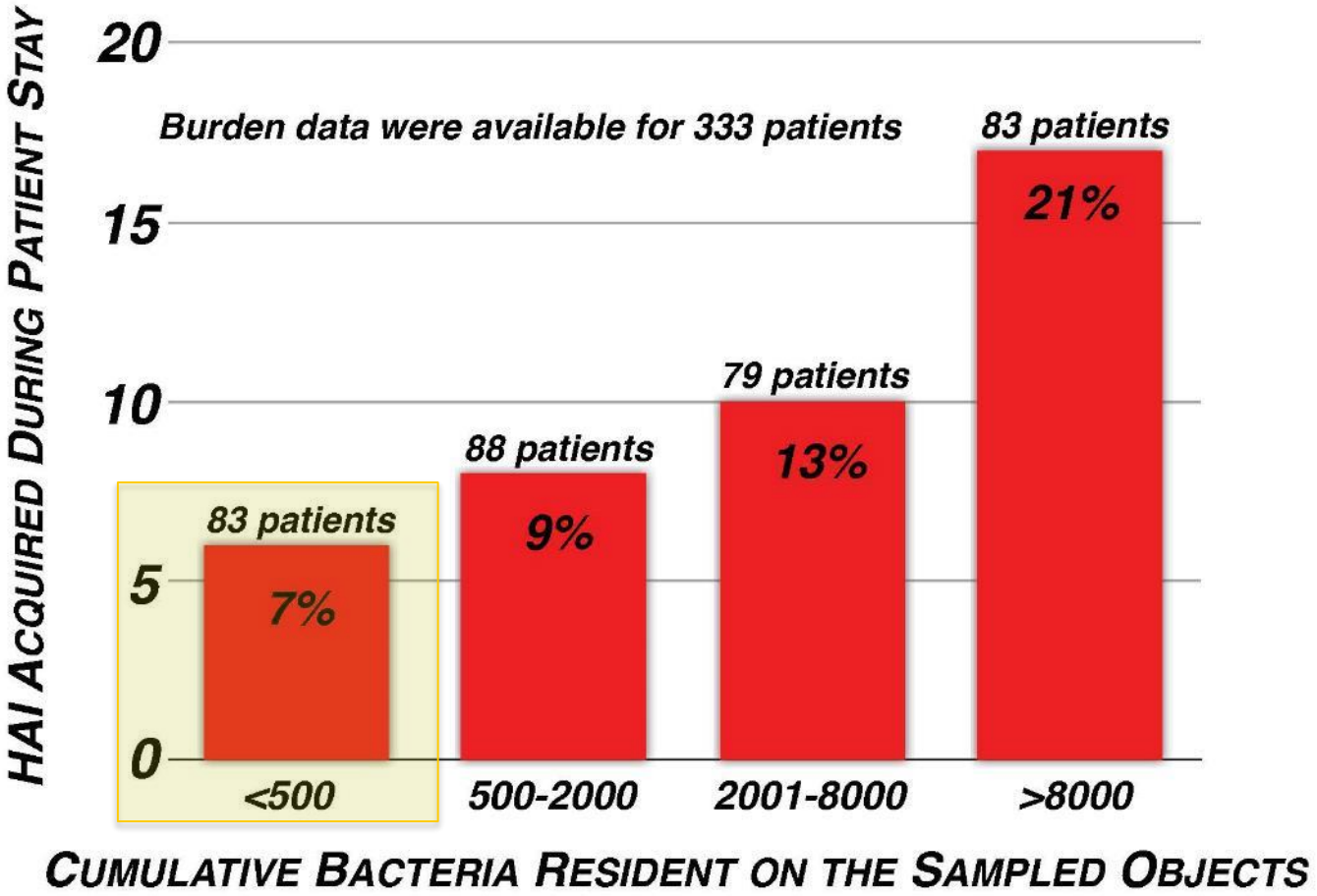

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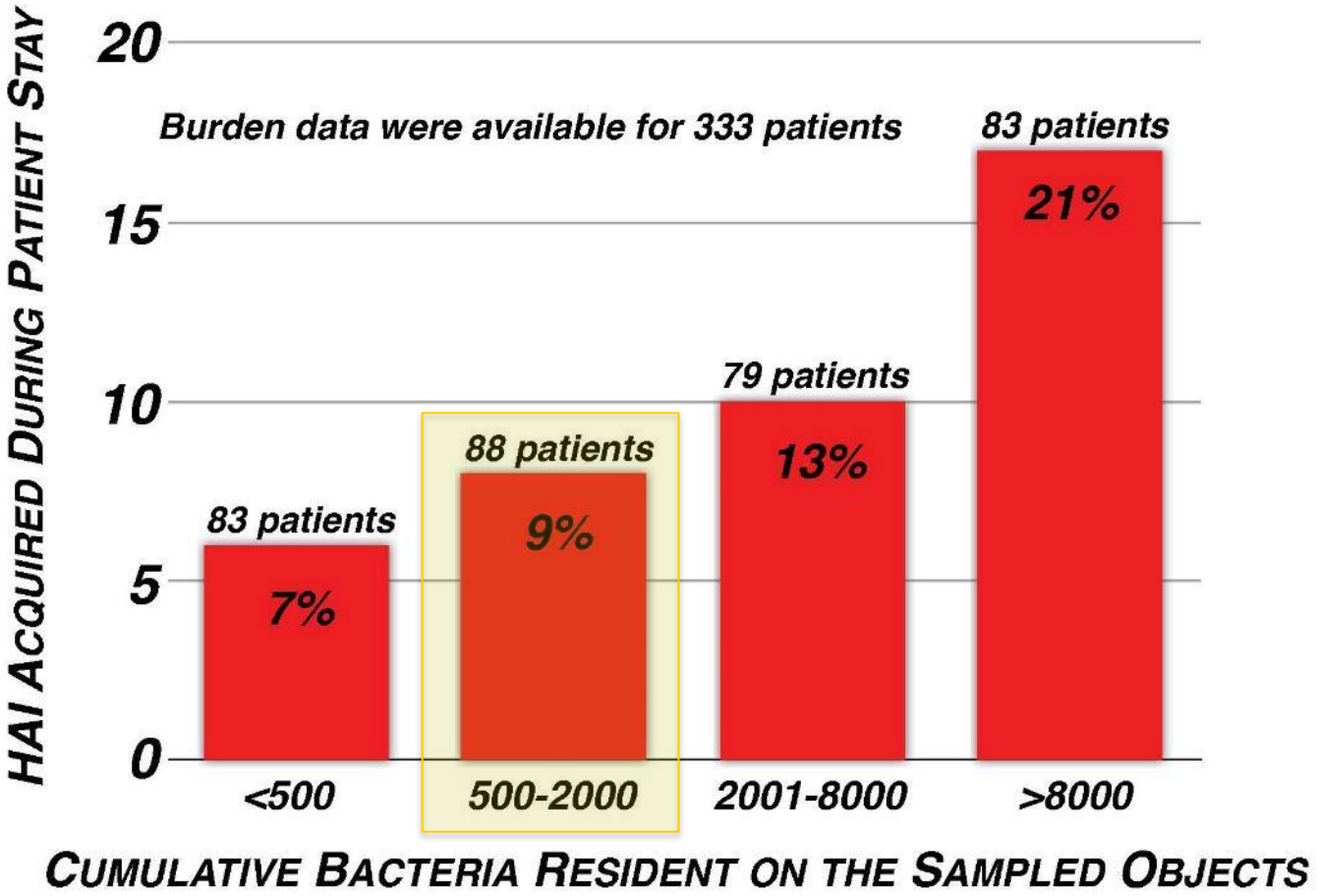

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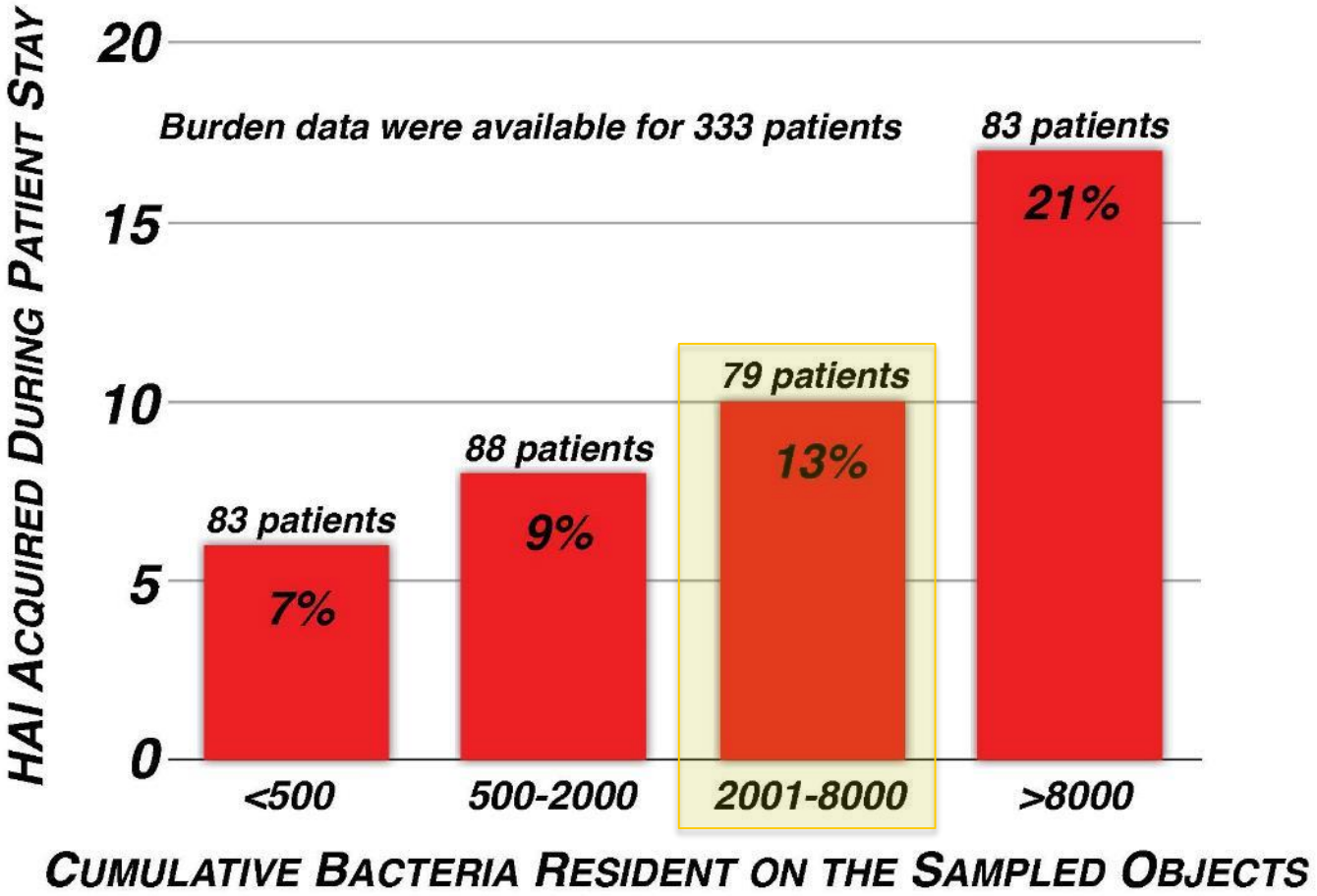

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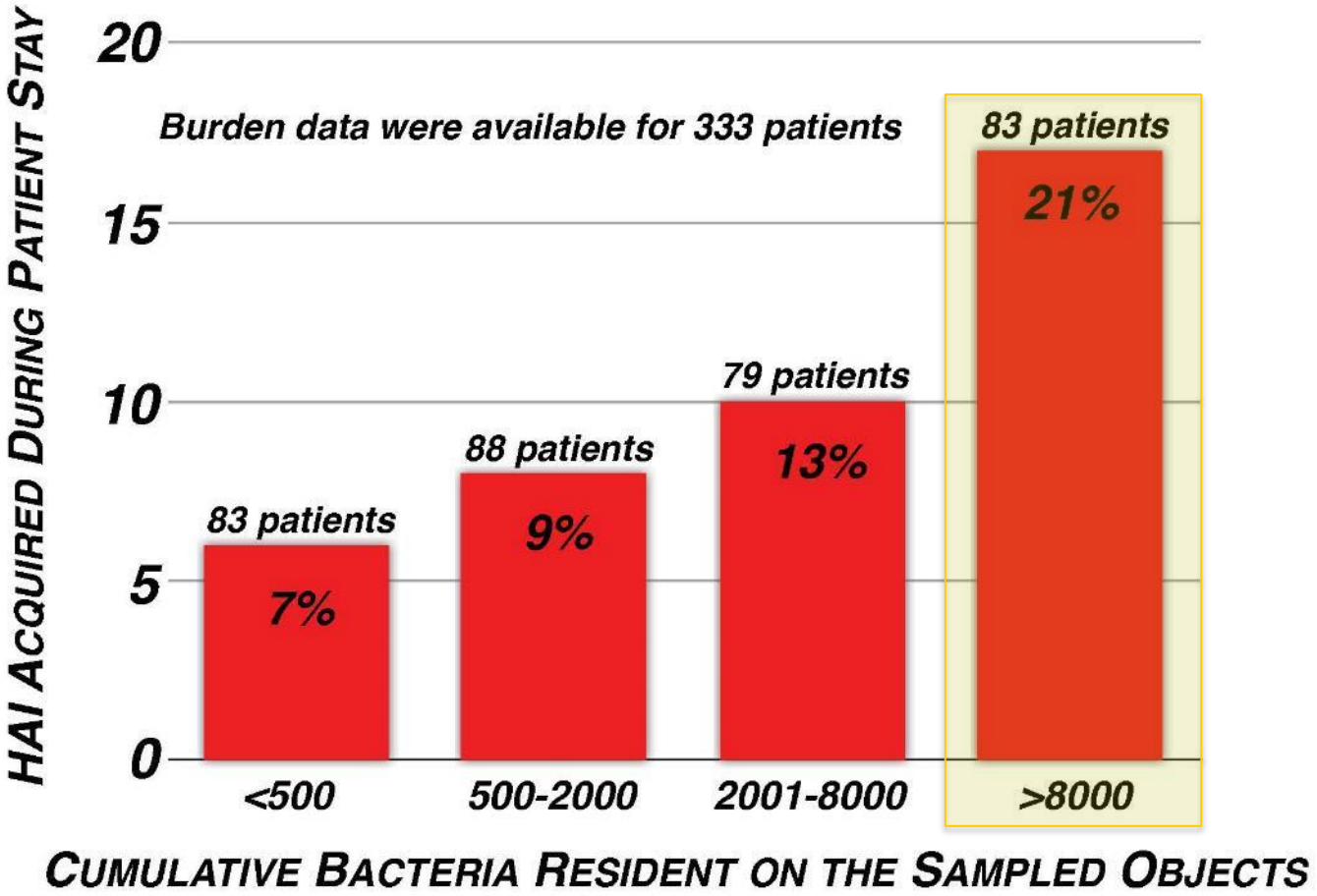

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The use of Antimicrobial Copper surfaces prevented 14 infections

Infections/Patients in Copper Rooms: 10/294 patients

Infections/Patients in Control Rooms: 26/320 patients

Normalizing to the number of patients in the Copper Rooms:

(26 x 294)/320 = 23.9 = 24 Infections

Thus 24 - 10 = 14 infections prevented by copper

Salgado et. al. "Copper surfaces reduce the rate of healthcare-acquired infection in the intensive care unit" Infection Control and Hospital Epidemiology, Vol. 34, No. 5, May 2013, pp. 479-486

Basic ROI for Antimicrobial Copper products

- Low Cost Scenario (assumes $29K/HAI)
  - 14 infections prevented X $29,000/Infection = **$406,000 Costs Saved**
  - $406,000 ÷ 338 days = **$1201 per day**
  - $52,000 ÷ 1201/day = **43.3 day payback period**

- High Cost Scenario (assumes $43K/HAI)
  - 14 infections prevented X $43,000/Infection = **$602,000 Costs Saved**
  - $602,000 ÷ 338 days = **$1781/day**
  - $52,000 ÷ $1781/day = **29.2 day payback period**

*HAI cost projections based on AHRQ estimates
*Estimated $52,000 to “copperize” 8 MICU Rooms (custom product pricing)

Early adopters: Pullman Regional Hospital

Pullman, WA

Early adopters: Charlotte-Hungerford Hospital

Torrington, CT

Early adopters: Regency Hospital

Golden Valley, MN

Antimicrobial Copper touch surfaces offer a powerful new infection-prevention tool. They work 24/7 to eliminate the bacteria that cause healthcare-acquired infections without staff behavioral changes. They are a one-time cost that provide long-term benefits.

Thank you

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Wilton.Moran@copperalliance.us
(212) 251-7212

www.AntimicrobialCopper.com

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