

## White Paper

# A New Ally in the Fight Against Bacteria that Cause Healthcare-acquired Infections

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More than 90,000 patients are admitted to U.S. hospitals daily<sup>1</sup>. People go to the hospital because they're ill or injured. However, during their stay, some patients can develop an illness that they didn't come in with. According to the Centers for Disease Control and Prevention, about one in 25 hospital patients has at least one healthcare-associated infection (HAI)<sup>2</sup>. The prevalence and substantial acquisition rate of HAIs has become a major concern in the healthcare industry. In 2011, it was estimated that of the approximately 722,000 patients who contracted HAIs, 10% died as a consequence of this adverse event subsequent to hospitalization<sup>3</sup>. The five major HAIs identified by the study are: central line-associated bloodstream infections, ventilator-associated pneumonia, surgical site infections, *C. difficile* infections and catheter-associated urinary tract infections<sup>2</sup>.

High-touch surfaces throughout a hospital can serve as reservoirs for pathogenic microorganisms, including *Staphylococcus aureus*, *Clostridium difficile* and vancomycin-resistant enterococci. These and other pathogens can survive from days to months on dry surfaces, making it difficult to maintain the current suggested standard for surface-level cleanliness. This white paper will look at the cost of HAIs and explain how copper can be implemented in hospitals and healthcare facilities to kill bacteria and help prevent HAIs.

<sup>1</sup> <http://health.usnews.com/health-care/best-hospitals/articles/faq-how-and-why-we-rank-and-rate-hospitals>

<sup>2</sup> <https://www.cdc.gov/hai/surveillance/index.html>

<sup>3</sup> <https://www.cdc.gov/hai/surveillance/>

## WHITE PAPER

### THE HIGH COST OF HAIS

A study found that an estimated \$9.8 billion is spent each year treating HAIs<sup>4</sup>. In addition to direct treatment costs, healthcare facilities also face several indirect costs as a result of HAIs, including: loss of work, legal costs and other patient factors. According to research by insurance company Aon Corp., Hospital Acquired Conditions (HACs), including HAIs, accounted for 12.2% of total legal liability costs insured by healthcare facilities in 2007<sup>5</sup>.

An increase in the number of HAI cases could also result in a decrease in funding. Approximately 23% of the more than 3,300 U.S. hospitals evaluated by the Center for Medicare and Medicaid Services will lose some reimbursement from Medicare as a consequence of the Hospital Acquired Condition Reduction Program or quality of care penalty mandated by law<sup>6</sup>.

A good reputation has always been highly valued by healthcare organizations. And, as more patients become savvy healthcare consumers, patient experience has become a crucial performance measure for healthcare facilities. However, the stigmatization of a hospital resulting from an HAI outbreak can severely damage a healthcare organization's reputation and ultimately impact its profit margin.

### USING COPPER ALLOYS AS AN ALLY

To decrease microbial pathogens, some hospitals have begun installing metal surfaces that are naturally antimicrobial, including bactericidal copper alloys, which begin killing 99.9% of infectious bacteria on contact.. Copper compounds have been used for medicinal purposes for thousands of years, yet copper alloys were just recently recognized by the Environmental Protection Agency as having antimicrobial effectiveness, driving the increased study and use of copper alloy surfaces<sup>7</sup>.

A research partnership between Grinnell College and Grinnell Regional Medical Center concluded that using copper alloy materials in a hospital setting substantially decreased the hospital's bacterial burden. Published in the online edition of the American Journal of Infection Control and authored by Grinnell College associate professor of biology Shannon Hinsla-Leasure, Ph.D., the study is the first to show that traditional surfaces in patient rooms quickly re-contaminate after terminal cleaning – even when the room is unoccupied<sup>3</sup>.

The study was conducted over 18 months at Grinnell College and Grinnell Regional Medical Center. During the study, patient rooms were cleaned daily and subjected to a final, or terminal, cleaning upon patient discharge<sup>4</sup>. High-touch areas were swabbed in occupied and unoccupied rooms and aerobic bacterial counts were determined for comparison purposes<sup>4</sup>.

The study tested CuVerro<sup>®</sup> bactericidal copper surfaces inside patient rooms at Grinnell Regional Medical Center (GRMC) and found that the copper was extremely effective in killing bacteria in a hospital environment<sup>4</sup>. CuVerro<sup>®</sup> is proven to kill antibiotic resistant superbugs like Methicillin-resistant Staphylococcus aureus (MRSA) and vancomycin-resistant enterococci (VRE)<sup>8</sup>. The study also concluded that when surfaces in patient rooms are made of bactericidal copper, bacterial loads rebound less than on traditional surfaces<sup>3</sup>.

<sup>4</sup> <http://jamanetwork.com/journals/jamainternalmedicine/fullarticle/1733452>

<sup>5</sup> <http://www.modernhealthcare.com/article/20080930/NEWS/309309981/>

<sup>6</sup> <http://www.grmc.us/newsarticle/2016/09/28/grinnell-college-study-finds-copper-alloy-surfaces-reduce-bacteria-possible-infection-in-hospitals>

<sup>7</sup> <https://www.grinnell.edu/news/study-finds-copper-alloy-surfaces-reduce-bacteria>

<sup>8</sup> <https://www.cuverro.com/scientific-proof/epa-registration-tests>

## WHITE PAPER

### OPPORTUNITY FOR CHANGE

Hospitals and healthcare facilities are often thought of as healing centers, but HAIs can be devastating to a hospital's revenue and reputation, and even deadly to patients. Copper provides the kind of solution to help protect people from infectious bacteria\* that patients and employees in the healthcare industry deserve.

The 2010 Centers for Disease Control and Prevention guidance recommends that hospitals not only obtain a high compliance rate with surface cleaning, but also move simultaneously to develop a program involving a system for an objective ongoing monitoring of cleaning practices to use such data in structured educational interventions within the institution<sup>9</sup>. By implementing the addition of copper for touch surfaces, healthcare organizations can increase compliance with this standard and help improve patient safety while subsequently, increasing their quality, reputation and bottom-line.

### SIDEBAR 1.1 – CASE STUDY

#### Pullman Regional Hospital Uses Larco CopperShield push plates to open the door to cleaner healthcare environments

Push plate switches are used throughout hospitals to allow for easy door accessibility for wheel chairs and heavy equipment such as hospital beds and carts. Many push plates are made of stainless steel, which can allow infectious bacteria to remain active for weeks. In 2002, the Centers for Disease Control and Prevention (CDC) estimated the national average for hospital-acquired infections (HAI) is about 4.5 infections per 100 hospital admissions. To reduce these growing numbers, the CDC and The Joint Commission have called for hospitals to actively pursue prevention, control and investigation of HAIs.

Pullman Regional Hospital in Pullman, Washington is taking extreme measures to combat deadly infections. Pullman falls well below the national average of 4.5% with a hospital-wide healthcare-acquired infection rate of under 1.2 % in 2015, but is looking to new technologies to reach its ultimate goal of zero healthcare related infections. Pullman conducts thorough room cleanings one to two times a day, but wants to do more to reduce infectious bacteria by switching out the type of material used on high-touch surfaces.

### CONVERTING TO COPPER

Pullman Regional Hospital recently received a \$10,000 grant from the Copper Development Association (CDA) to replace some of its most frequently touched metal surfaces with copper-alloy hardware. In December 2013, the hospital began replacing its most frequently-touched surfaces with copper. The first items to be replaced with antimicrobial copper were the stainless steel push plates throughout the building. Unlike any other touch-surface metal, copper is recognized by the U.S. Environmental Protection Agency (EPA) as being able to continuously kill 99.9% of bacteria\* that can cause HAIs, including Methicillin-resistant Staphylococcus aureus (MRSA), within two hours of contact, when cleaned regularly.

“Copper provides an opportunity to kill deadly bacteria that cause infections because it continuously cleans without having to do anything (other than routine cleaning),” said Ed Harrich, Pullman Regional Hospital Director of Surgical Services. “We turned to ATEK Access Technologies because it is a leader in access technologies for public entrances and the only copper push plate manufacturer in the U.S.”

<sup>9</sup> <https://www.cdc.gov/HAI/toolkits/Evaluating-Environmental-Cleaning.html>

## WHITE PAPER

### ACCESSING A SOLUTION

The Larco CopperShield push plate, an automatic door activation switch made from CuVerro® bactericidal copper, helps inhibit build-up and growth of bacteria\* between routine cleaning and sanitizing, and continuously kills bacteria\*. Pullman Regional Hospital uses the 4.5 inch square push plate, which features a handicap logo and "press to open" engraving on 18-gauge brushed copper alloy. The push plates can be mounted directly into electrical or universal mounting boxes, and can be hardwired or connected wirelessly to the door.

According to Harrich, the conversion to the Larco CopperShield push plates was easy and cost effective.

**"The Larco CopperShield push plate is an integral part of our improved infection control plan,"** said Harrich. **"Its ability to continuously combat bacteria falls right in line with the culture of 'patient safety first.'"**

### CUTTING INFECTIONS AND COSTS

By killing bacteria\* that cause infections, the Larco CopperShield push plates not only help keep Pullman compliant with the CDC standard, they also decrease the potential for patients to come in contact with deadly bacteria, potentially saving Pullman Regional Hospital millions of dollars in re-admissions costs. According to the Journal of Medical Economics, HAIs in U.S. acute-care hospitals lead to direct and indirect costs totalling \$96 – \$147 billion annually. Harrich also says the Larco CopperShield push plates are cosmetically pleasing and the Pullman Regional Hospital staff is also happy because the plates provide a more hygienic environment.

In addition to the Larco CopperShield push plates, Pullman Regional Hospital also replaced 72 faucets, 1,100 drawer pulls and four IV pull handles with bactericidal copper, and plans to do more, including arm rests and door handles.

**"We're focused on the closest touch points to patients right now in order to achieve our goal of zero infections, and the Larco CopperShield wall switch will help us further supplement our current infection control program because of its inherent ability to kill bacteria that cause these infections,"** said Harrich.

Pullman Regional is one of the first hospitals in the country to start using bactericidal copper for its touch surfaces, but Harrich expects the trend to catch on quickly as hospitals across the nation are ramping up their efforts to reduce and eliminate bacteria that cause infections.

\*Laboratory testing shows that, when cleaned regularly, CuVerro surfaces kill greater than 99.9% of the following bacteria within 2 hours of exposure: Methicillin-resistant Staphylococcus aureus, Staphylococcus aureus, Enterobacter aerogenes, Pseudomonas aeruginosa, E. coli O157:H7, and Vancomycin-Resistant Enterococcus faecalis (VRE).

The use of CuVerro® bactericidal copper products is a supplement to and not a substitute for standard infection control practices; users must continue to follow all current infection control practices, including those practices related to cleaning and disinfection of environmental surfaces. This surface has been shown to reduce microbial contamination, but it does not necessarily prevent cross contamination. CuVerro® is a registered trademark of GBC Metals, LLC and is used with permission (L-0008-1701). See [cuverro.com](http://cuverro.com) for more details.

# Hospitals can be dirty & pose a **risk of infection**\*

**1:25**

patients will contract a  
Healthcare-Associated Infection

**75,000**

people DIE each year from  
Healthcare-Associated Infections

**\$147 BILLION**

ANNUAL TOTAL COST of  
Healthcare-Associated Infections

## Clinical study assessed **copper's** ability to kill bacteria\*\*

During a clinical study  
published in the American  
Journal of Infection Control†

**COPPER**

was added to

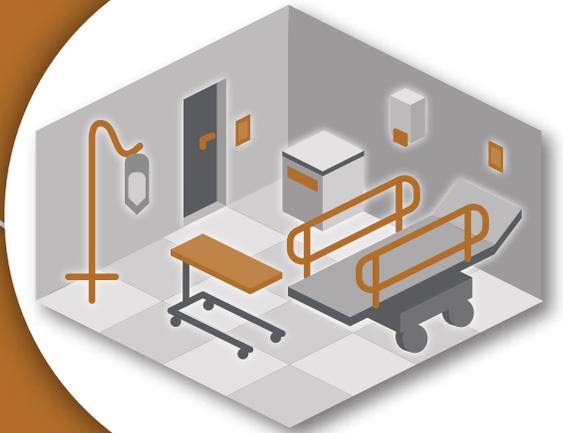
**50%**

of patient rooms

18 months | 1,319 samples



**19 TOUCH SURFACES**  
were swapped out for  
CuVerro® COPPER



## The findings:



\*Centers for Disease Control and Prevention, "HAI Data and Statistics," <http://www.cdc.gov/hai/surveillance/>, Marchetti A, Rossiter R. Economic burden of healthcare-associated infection in US acute care hospitals: societal perspective. J Med Econ 2013; 16:1399-404.

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†Hinsa-Leasure, S., Nartey, Q., Vaverka, J., and Schmidt, M.G. (2016). Copper Alloy Surfaces Sustain Terminal Cleaning Levels in a Rural Hospital. American Journal of Infection Control. Full text available at link below.

‡The standard threshold for a benign, or clean, surface is <250 colony forming units of microorganisms per 100cm<sup>2</sup>. Anything above this threshold poses potential risk for microbial transmission.



To learn more visit [www.cuverro.com/GRMCstudy](http://www.cuverro.com/GRMCstudy)



[www.larco.com](http://www.larco.com)

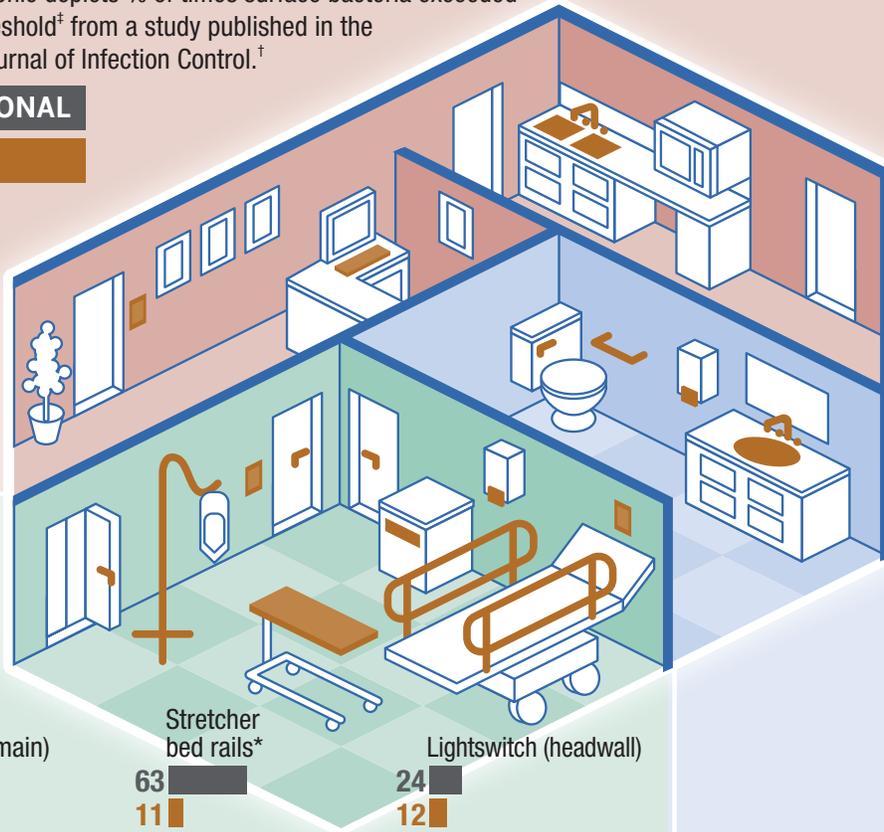
# Healthcare surface cleanliness: **Copper** vs. Traditional

## Common Areas

**COPPER** surfaces harbor fewer bacteria in occupied healthcare settings. Graphic depicts % of times surface bacteria exceeded cleaning threshold<sup>†</sup> from a study published in the American Journal of Infection Control.<sup>†</sup>

**TRADITIONAL**

**COPPER**



Disinfectant dispenser  
32  
0

Lightswitch (main)  
41  
23

Overbed table  
47  
12

Bedside table pull  
58  
25

Stretcher bed rails\*  
63  
11

Door lever  
58  
21

IV pole  
30  
3

Lightswitch (headwall)  
24  
12

Pass-thru handle (hall)  
12  
0

Pass-thru handle (patient)  
67  
21

Keyboard  
82  
21

Sink  
100  
6

Faucet handle  
88  
6

ADA pushplate  
28  
0

Sink  
69  
12

Soap dispenser  
86  
27

Grab bar  
95  
21

Flush handle  
63  
21

Faucet handle  
70  
17

Patient Room

Patient Bathroom



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<sup>‡</sup>The standard threshold for a benign, or clean, surface is <250 colony forming units of microorganisms per 100cm<sup>2</sup>. Anything above this threshold poses potential risk for microbial transmission. \*Sampled in emergency room.



To learn more visit [www.cuverro.com/GRMCstudy](http://www.cuverro.com/GRMCstudy)



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