



RACHIELE

The Trusted Name in Copper Product Manufacturing Since 1999

Made in the USA

Antimicrobial Copper Medical Equipment

Antimicrobial Medical Equipment

It's all about what people touch!

It has been known for centuries that copper has intrinsic medical benefits to humans. Science suggests that copper surfaces affect bacteria in two sequential steps: the first step is a direct interaction between the surface and the bacterial outer membrane, causing the membrane to rupture. The second is related to the holes in the outer membrane, through which the cell loses vital nutrients and water, causing a general weakening of the cell. Now that the cell's main defense (its outer envelope) has been breached, there is an unopposed stream of copper ions entering the cell. This puts several vital processes inside the cell in danger. Copper literally overwhelms the inside of the cell and obstructs cell metabolism (i.e., the biochemical reactions needed for life). These reactions are accomplished and catalyzed by enzymes. When excess copper binds to these enzymes, their activity grinds to a halt. The bacterium can no longer "breathe", "eat", "digest" or "create energy."

The Problem: It is a fact that 1 in 20 US citizens who are hospitalized acquire an infection in the hospital.

The Definition: Nosocomial infections are infections that are a result of treatment in a hospital or a healthcare service unit. Infections are considered nosocomial if they first appear 48 hours or more after hospital admission or within 30 days after discharge. This type of infection is also known as a hospital-acquired infection (or, in generic terms, healthcare-associated infection).

The Cost: In the United States, the Centers for Disease Control and Prevention estimate that roughly 2 million hospital-associated infections, from all types of microorganisms, including bacteria, combined, cause or contribute to 100,000 deaths each year. (over twice the auto fatalities per year) The estimated cost to the hospitals is estimated between \$35 billion to \$45 billion a year.* There are 5,815 registered hospitals in the US. Using the most likely figure of 45 billion, each hospital spends \$6 million a year on unreimbursed treatments - to say nothing of the lives lost and law suits.

Just as seatbelts save lives, antimicrobial touch surfaces will do the same. There is no excuse not to wear a seat belt. There should be no excuse not to have antimicrobial touch surfaces in hospitals. It is the right thing to do.

* March 2009 report by CDC

Every surface can be continuously killing bacteria*

Once you realize touch surfaces should be continuously killing bacteria*, Antimicrobial Copper is the clear choice.

It's a new way of thinking, a different mindset, to see the choice of touch surface material as one of the most important decisions in the fight against bacteria* that cause Healthcare-Associated Infections. Touch surfaces should be continuously killing bacteria* - day and night, between touches and between cleanings. Everywhere you look there are opportunities to upgrade stainless steel or plastic touch surfaces to Antimicrobial Copper. By replacing fixtures, fittings and other touch surfaces with Antimicrobial Copper you can continuously kill bacteria* that cause infections.

However, as infection control is a multifaceted challenge, Antimicrobial Copper needs to be seen as a supplement to, not a substitute for, standard infection control practices. You must continue to follow all current practices, including those practices related to cleaning and disinfection of environmental surfaces.

Incidence extrapolations for USA for Nosocomial infections: 2,000,000 per year, 166,666 per month, 38,461 per week, 5,479 per day, 228 per hour, 3 per minute, 0 per second. Note: this extrapolation calculation uses the incidence statistic: estimated 2 million cases annually or about 10% of American hospital patients (CDC/NNIS 1992)

What we offer

Rachiele offers a wide range of antimicrobial copper products for the healthcare industry. Some of the products we will offer are listed below.

- Medical Cart Tops
- Hand Wash Sinks
- Mayo Cart Trays
- Door Push Plates
- Lab Tables
- Instrument Trays
- Table Tops
- Electrical Plates
- Door Kick Plates
- IV Stands
- Cabinetry Doors and Drawer Fronts

We will be introducing more products as time permits. Please feel free to contact us with your specific requirements.

Rachiele, LLC

74 West 2nd Street
Apopka, FL 32703

407-496-3596
Fax: 407-386-3434

www.antimicrobialmedicalequipment.com

E-Mail: Dino@Rachiele.com

* Laboratory testing shows that, when cleaned regularly, Antimicrobial Copper™ kills greater than 99.9% of the following bacteria within 2 hours of exposure: MRSA, Vancomycin-Resistant *Enterococcus faecalis* (VRE), *Staphylococcus aureus*, *Enterobacter aerogenes*, *Pseudomonas aeruginosa*, and *E. coli* O157:H7.

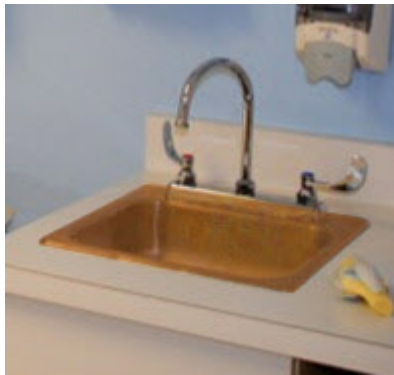
RACHIELE **Cu⁺**

Trusted for decades, the Mayo Cart was traditionally made of stainless steel. We now know that bacteria can live on stainless for over 30 days. Antimicrobial Copper is the way of the future in health care products. We are able to manufacture the tray with antimicrobial copper. Potentially reducing the potential for spreading disease.



The surgical scrub sink is one of the most critical areas with regard to germ control. Once again, these have been traditionally manufactured of stainless steel. Now available in antimicrobial copper.

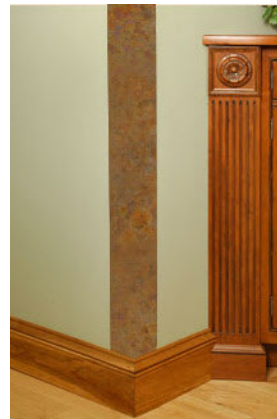
Germs have been pushed around on carts for decades. An antimicrobial cart is one of the most effective ways in reducing nosocomial infections. Carts are custom made, hence any size or shape is available.



Found in virtually every doctors office - the hand wash sink. Again, traditionally made of stainless steel. Now they are available in antimicrobial copper - custom sized to allow for retrofit or new construction.



One of the most common disease spreading touch surfaces is the door. Using antimicrobial push and kick plates may significantly reduce the spread of disease. This is a simple retrofit solution, and an even simpler program in planning new construction. Studies have shown that door touch surfaces are one of the top two leading causes of germ spread in hospitals.



Corner guards made of antimicrobial copper. Custom sizes available. By the way, the notion that copper is very soft is not the case. We use cold rolled hard copper, generally 14 gauge. Our copper is extremely hard and durable.



Last, but not least - the I.V. stand. The I.V. stand tops the charts in potential for spreading nosocomial infections. The icon for life saving potential could very well be the culprit for causing more deaths than we

once knew. Antimicrobial copper is the solution.

All of our products are custom made. All inquiries welcome

Every surface can be continuously killing bacteria*

Once you realize touch surfaces should be continuously killing bacteria*, Antimicrobial Copper is the clear choice.

It's a new way of thinking, a different mindset, to see the choice of touch surface material as one of the most important decisions in the fight against bacteria* that cause Healthcare-Associated Infections. Touch surfaces should be continuously killing bacteria* - day and night, between touches and between cleanings. Everywhere you look there are opportunities to upgrade stainless steel or plastic touch surfaces to Antimicrobial Copper. By replacing fixtures, fittings and other touch surfaces with Antimicrobial Copper you can continuously kill bacteria* that cause infections.

However, as infection control is a multifaceted challenge, Antimicrobial Copper needs to be seen as a supplement to, not a substitute for, standard infection control practices. You must continue to follow all current practices, including those practices related to cleaning and disinfection of environmental surfaces.

Copper is the active, bacteria* killing ingredient

Antimicrobial Copper isn't a red, soft metal, it's a host of materials that can be formed into durable, easy-to-clean, affordable touch surfaces available a variety of colors and finish options.

Copper can be combined with other metals to create alloys such as brass and bronze. These materials can be used to create a wide variety of strong, durable surfaces suitable for a range of applications. With over 280 alloys registered by the EPA, an array of color, form and finish options are available to satisfy diverse design needs.

Three main characteristics make Antimicrobial Copper the most effective* touch surface material:

* Laboratory testing shows that, when cleaned regularly, Antimicrobial Copper™ kills greater than 99.9% of the following bacteria within 2 hours of exposure: MRSA, Vancomycin-Resistant Enterococcus faecalis (VRE), Staphylococcus aureus, Enterobacter aerogenes, Pseudomonas aeruginosa, and E. coli O157:H7. Antimicrobial Copper surfaces are a supplement to and not a substitute for standard infection control practices and have been shown to reduce microbial contamination, but do not necessarily prevent cross contamination; users must continue to follow all current infection control practices. Michels et al, Lett Appl Microbiol, 49 (2009) 191-195 demonstrated that Antimicrobial Copper™ outperforms two commercially available silver-containing coatings under typical indoor conditions.

Superior physical properties

The right Antimicrobial Copper alloy can go head to head with steel in terms of strength and durability. In addition to their antimicrobial properties, Antimicrobial Copper alloys are:

- * Durable
- * Wear-resistant
- * Can stand up to harsh environments and chemicals
- * Can retain details and finish over time

Flexible manufacturing capabilities

Antimicrobial Copper alloys are extremely versatile and can be manufactured using a variety of conventional metal manufacturing processes. Antimicrobial Copper can be:

- * Drawn
- * Machined
- * Cast
- * Joined
- * Bent

Competitive cost

Material cost doesn't drive final product price. Manufacturing costs of Antimicrobial Copper are very competitive when comparing to other materials. Some of the contributing factors are:

- * Easily fabricated
- * More parts per minute
- * Longer tool life
- * Completely recyclable

Think of Antimicrobial Copper as an additional weapon in the fight against bacteria* that cause Healthcare-Associated Infections

Antimicrobial Copper supplements your standard infection control practices that are vital to patient safety.

Continuously killing bacteria* never looked so good

The Science behind Antimicrobial Copper.

Science suggests that Antimicrobial Copper kills bacteria* with a multifaceted attack.

The mechanism by which Antimicrobial Copper kills bacteria* is a complex by nature, but the effect is simple. The questions and answers below summarize active and ongoing research seeking to explain how Antimicrobial Copper is the most effective* touch surface.

How does copper affect bacteria?

Science suggests that copper surfaces affect bacteria in two sequential steps: the first step is a direct interaction between the surface and the bacterial outer membrane, causing the membrane to rupture. The second is related to the holes in the outer membrane, through which the cell loses vital nutrients and water, causing a general weakening of the cell.

How can copper punch holes in a bacterium?

Every cell's outer membrane, including that of a single cell organism like a bacterium, is characterized by a stable electrical micro-current. This is often called "transmembrane potential", and is, literally, a voltage difference between the inside and the outside of a cell. It is strongly suspected that when a bacterium comes in contact with a copper surface, a short circuiting of the current in the cell membrane can occur. This weakens the membrane and creates holes.

Another way to make a hole in a membrane is by localized oxidation or "rusting." This happens when a single copper molecule, or copper ion, is released from the copper surface and hits a building block of the cell membrane (either a protein or a fatty acid). If the "hit" occurs in the presence of oxygen, we speak of "oxidative damage", or "rust." An analogy is rust weakening and making holes in a piece of metal.

After punching holes, how do copper ions further damage the cell?

Now that the cell's main defense (its outer envelope) has been breached, there is an unopposed stream of copper ions entering the cell. This puts several vital processes inside the cell in danger. Copper literally overwhelms the inside of the cell and obstructs cell metabolism (i.e., the biochemical reactions needed for life). These reactions are accomplished and catalyzed by enzymes. When excess copper binds to these enzymes, their activity grinds to a halt. The bacterium can no longer "breathe", "eat", "digest" or "create energy."

How can copper's effect be so fast, and affect such a wide range of microorganisms?

Experts explain the speed with which bacteria perish on copper surfaces by the multi-targeted nature of copper's effects. After membrane perforation, copper can inhibit any given enzyme that "stands in its way," and stop the cell from transporting or digesting nutrients, from repairing its damaged membrane, from breathing or multiplying.

It is also thought that this is why such a wide range of microorganisms are susceptible to contact action by copper.

"70% of organisms causing Healthcare Associated Infections are resistant to at least one antibiotic."

First world forum on healthcare associated infections.
Veyrier-du-Lac, France: bioMérieux Corp; June 4-5, 2007

"Almost 100,000 people die each year from Healthcare Associated Infections in the U.S. alone."

Klevens, Edwards, Richards, et al. Pub Health Rep 2007;122:160-6

"The direct cost of Healthcare Associated Infections in the U.S. alone is between \$35 billion and \$45 billion each year."

SCOTT, R. D. II (2009): The Direct Medical Costs of Healthcare Associated Infections in U.S. Hospitals and the Benefits of Prevention. Division of Healthcare Quality Promotion, report to Centers for Disease Control and Prevention.

Clinical Trial Results Demonstrate Copper Reduces MRSA & VRE in Hospital Rooms

ICU trial touch surfaces show less contamination

NEW YORK, NY (March 22, 2010) - Recent clinical tests demonstrate that antimicrobial copper is effective in significantly reducing the bacterial load in intensive care unit (ICU) patient rooms and on many individual objects in those rooms. Results from a U.S. Department of Defense-funded clinical trial assessing the ability of antimicrobial copper to reduce the amount of bacteria on surfaces commonly found in hospital rooms was reported in at the Fifth Decennial International Conference on Healthcare-Associated Infections in Atlanta, GA.

Exposure to organisms that were found in ICU rooms may lead to healthcare-acquired infections that can result in illness and death. Michael Schmidt, Ph.D., Professor and Vice Chairman of the Department of Microbiology and Immunology at the Medical University of South Carolina, and an author of the poster, said, "It is well known that hospital-acquired infections have a high cost, both in terms money spent treating them and lives lost. One in twenty hospital patients will develop a hospital-acquired infection; that number increases to thirty percent for patients in intensive care units."

The first phase of this study showed that the most heavily contaminated objects are those in closest proximity to the patients. High levels of *Staphylococcus aureus*, methicillin resistant *Staphylococcus aureus*, (MRSA) and vancomycin-resistant enterococci (VRE) were found on common objects, such as bed rails, call buttons and visitor chairs. Because these bacteria can survive for extended periods of time, contaminated surfaces can act as a means for spreading bacteria to patients, visitors and healthcare workers.

In the second phase of the trial, copper bed rails, tray tables, chair arms, call buttons, monitors and IV poles replaced the stainless steel and plastic versions in ICU rooms of three hospitals: Memorial Sloan-Kettering Cancer Center in New York City, the Medical University of South Carolina, and the Ralph H. Johnson VA Medical Center, both in Charleston, SC.

The phase two trial results were very positive. Copper was effective in significantly reducing the total bacterial load in ICU patient care rooms and on many individual objects within those rooms. Further study is needed to assess whether copper touch surfaces can play a role in preventing cross contamination and the transmission of hospital-acquired infections.

Laboratory testing independent of the clinical trial has proven that copper and copper alloys, such as brass and bronze, kill 99.9 percent of bacteria within two hours, when cleaned regularly and as a supplement to routine cleaning and disinfection programs. These findings led the U.S. Environmental Protection Agency to register these materials as public health antimicrobial products that can control vancomycin-resistant enterococci (VRE), methicillin-resistant *Staphylococcus aureus* (MRSA), *Staphylococcus aureus*, *Enterobacter aerogenes*, *Pseudomonas aeruginosa*, and *E. coli* O157:H7, all of which are associated with infections or other adverse effects in humans.

The clinical trial is funded by the U.S. Department of Defense under the aegis of the Telemedicine and Advanced Technologies Research Center (TATRC), a section of the Army Medical Research and Materiel Command (USAMRMC).

International Copper Industry Defines Role in the Fight Against Hospital Infections

January 5, 2009

"25% of the population is colonized with *Staphylococcus aureus*."

CDC, National Center for Preparedness, Detection, and Control of Infectious Diseases (NCPDCID), 2008.

"4.5 infections are acquired per 100 admissions."

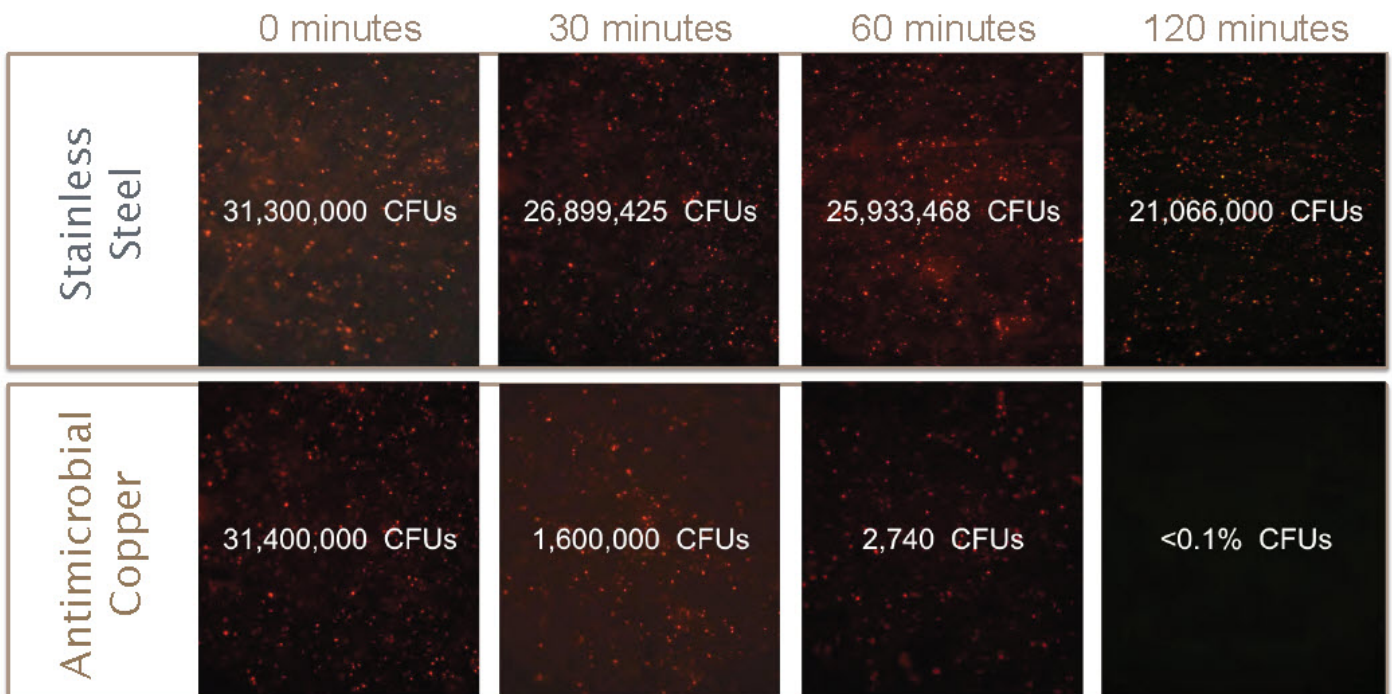
Klevens, Edwards, Richards, et al. Pub Health Rep 2007;122:160-6

NEW YORK, NY-The copper industry is working together to answer one very important question: Can copper and copper alloys (brass and bronze) help curb the spread of bacteria that cause hospital infection? Results of laboratory testing and clinical trials indicate that they can. Scientists from around the world shared their work at the first world congress, 'Copper and Public Health', on copper's role in fighting the bacteria that cause hospital-acquired infections. The conference was held in Athens, Greece in November.

Leading scientists from the U.K., U.S., Germany and Greece, representing the disciplines of infection control, pathology, microbiology, hospital design, metallurgy and engineering, presented the scientific evidence supporting the case for incorporating copper surfaces into healthcare environments to help reduce the risk of infection and to protect public health. The first results from a clinical trial in Birmingham, England, demonstrate that the use of copper on certain surfaces on a busy hospital ward resulted in 90-95 percent fewer micro-organisms than the amount found on the control ward.

In the U.S., hospital-acquired infections claim the lives of some 100,000 people each year. The U.S. Copper Development Association (CDA) is taking a lead role in this international effort through two main initiatives: EPA registration of copper and copper alloys as antimicrobial and the initiation of clinical trials in three U.S. hospitals.

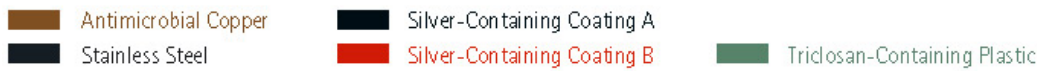
Another Example: *E. Coli* O157:H7



Epifluorescence Images after Staining with Viability Fluorophore CTC

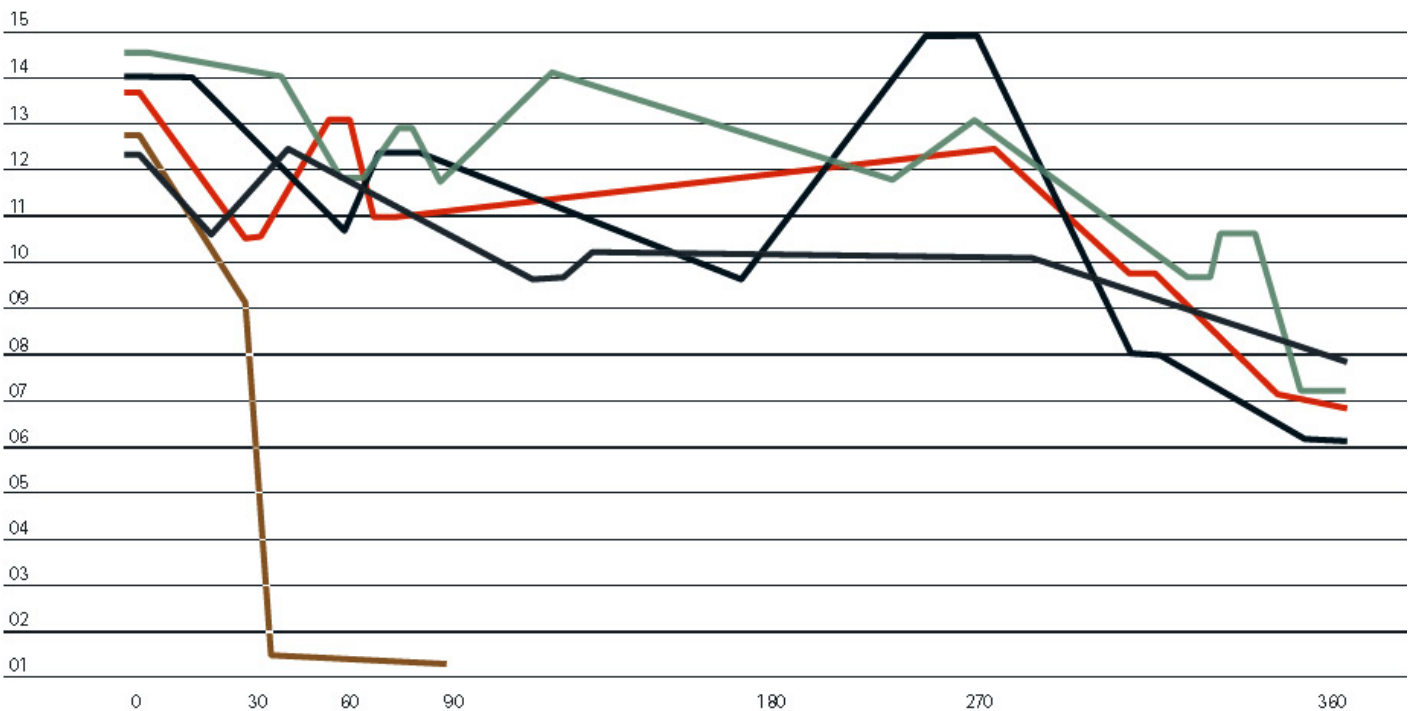
Antimicrobial effectiveness

Antimicrobial Copper is the most effective* touch surface material, killing greater than 99.9% of bacteria* within 2 hours of exposure. No other material, such as silver-containing coatings or stainless steel, comes close.

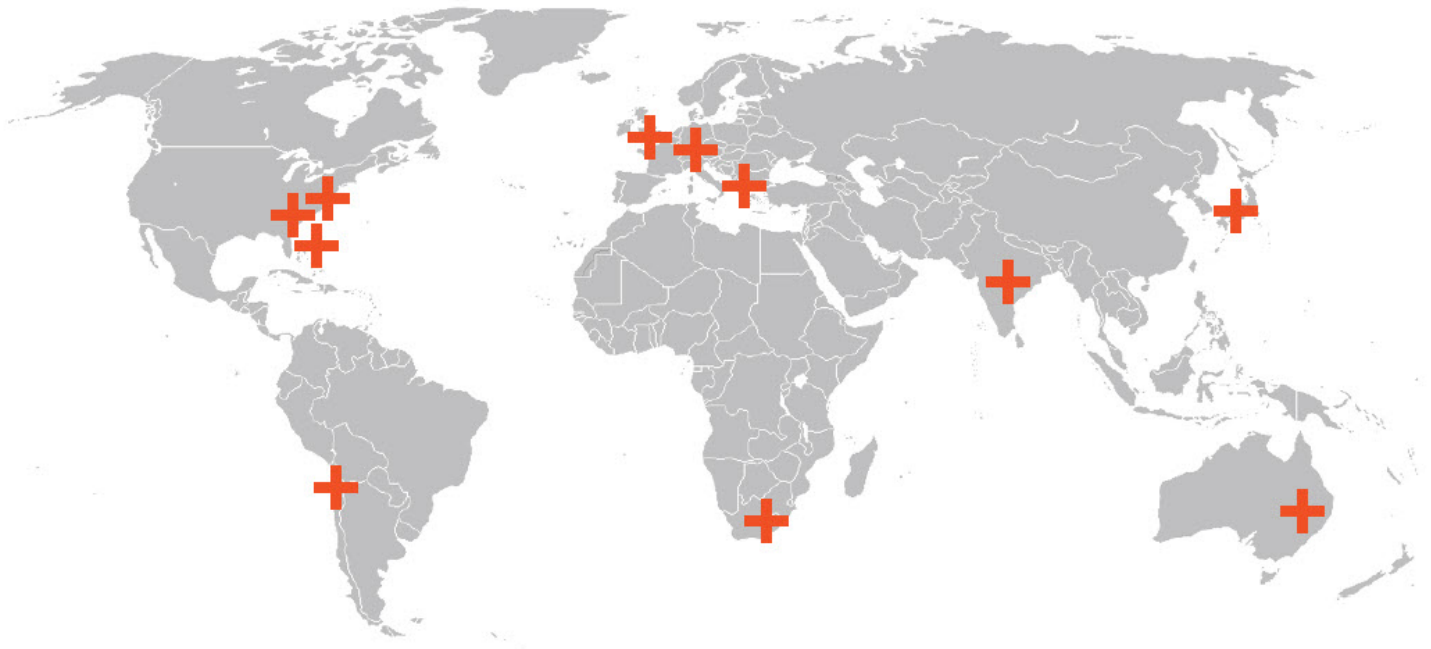


Antimicrobial effectiveness under typical indoor conditions

CFU (Colony Forming Units) of MRSA
Millions



Clinical tests and trials are currently in operation around the world and results are positive



New strains of “superbug” have entered hospitals, schools and other public buildings

Princeton schools report 3 MRSA infections

BY ROBERT STERN
STAFF WRITER

PRINCETON BOROUGH — The Princeton Regional School District has Mercer County's only reported cases of antibiotic-resistant staph infections out-

“It's possible they got it from home, it's possible they got it from school, it's possible they got it from anywhere.”

JOHNSON NSUBUGA, MERCER COUNTY EPIDEMIOLOGIST

ions caused by MRSA have been being for years among certain groups, such as hospital patients, prison inmates, athletes, recruits and people with weak immune systems, according to the state I

Staph warning sent to day care families

... warning information recently had from a related high-risk to be kept in the school as a last resort. Most hospitals require that doctors get special approval to prescribe the best new antibiotics. In that regard, what's good for public health isn't necessarily good for antibiotic development.

Capitons regulation is another problem, adding to uncertainty and, in turn, the cost of development. For drugs targeted to these common bacterial ailments, the FDA historically required so-called new antibiotic trials. This meant a new antibiotic needed to prove it was generally no more than existing treatments in order to win regulatory approval. Otherwise, conducting trials to prove a new antibiotic was better than a major pill already on the market was required to existing drugs — would require long trials, and, if

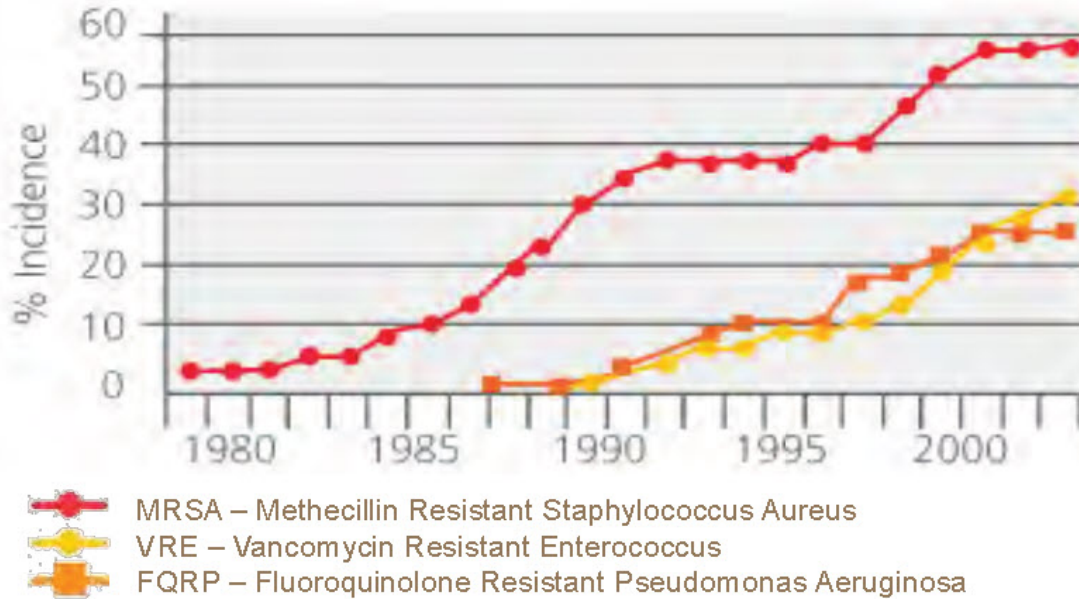
Attack of the Superbugs

OPINION

Dirty Hospitals

By Katharine Greider
Photographs by Kiyoshi Togashi

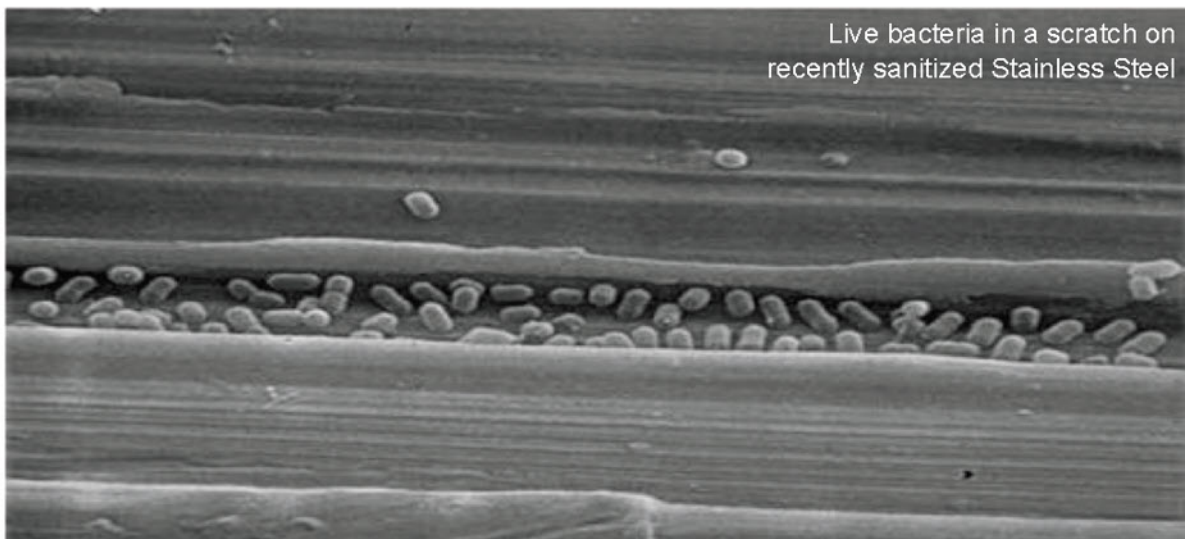
These superbugs continue to contribute to a rise in the number of hospital acquired infections



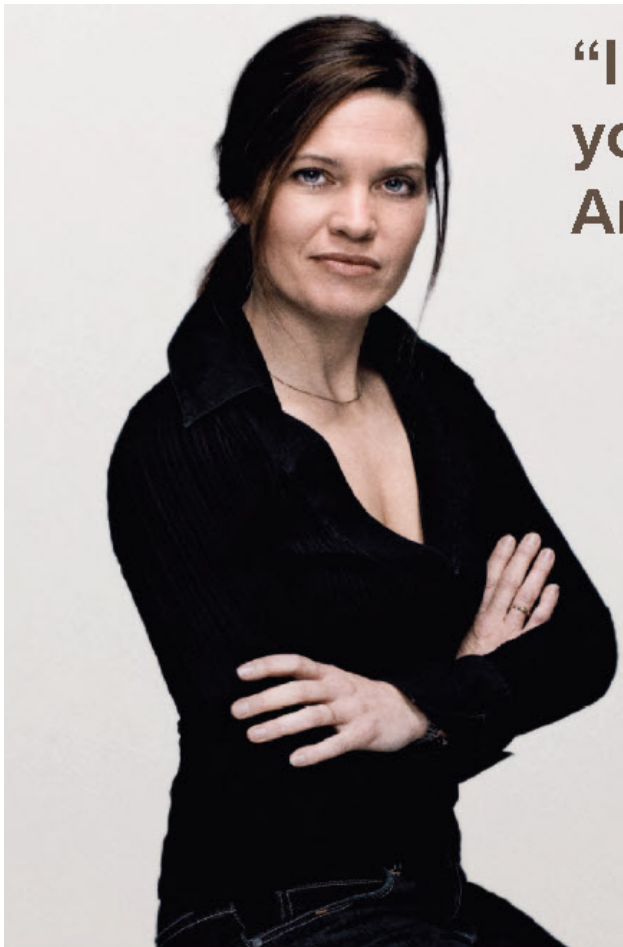
“Infections acquired during hospital stays kill more people than breast cancer, auto accidents and AIDS combined”

Dan Childs, ABC News, Medical Unit

Even though healthcare furnishings are designed to be easily cleaned - are they really clean?



Bacteria that cause infections can be found in administrative areas and patient wards (after cleaning)

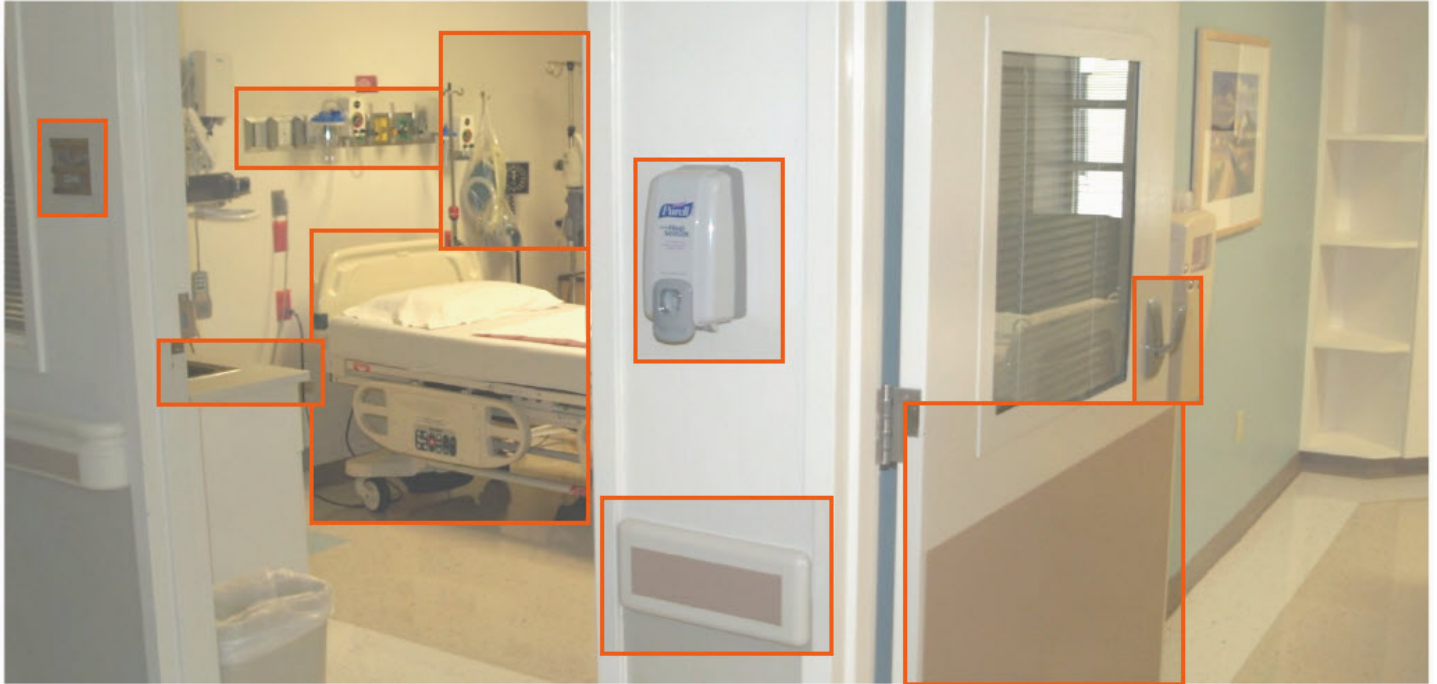


“In this day and age, you can’t afford not to use Antimicrobial Copper”

Once you realize touch surfaces should be continuously killing bacteria*, Antimicrobial Copper is the clear choice.

By replacing and upgrading fixtures, fittings and other touch surfaces with Antimicrobial Copper options you will be continuously killing bacteria* that cause infections in between routine cleanings.

Everywhere you look there are opportunities to upgrade touch surfaces to Antimicrobial Copper



Wherever you find this mark, you can trust Antimicrobial Copper is continuously killing bacteria* that cause infections.

The mark is used by leading manufacturers of hospital equipment, furniture and fittings to indicate that their products contain Antimicrobial Copper, the world's most effective* antimicrobial touch surface material.