

SOFT SURFACE BACTERIAL CONTAMINATION:

CONSIDERATIONS FOR A COMPLETE INFECTION PREVENTION PROGRAM

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While changing the dressing of a MRSA infected wound, a nurse realizes that visitors in the hall can see her ICU patient in a compromised position. The nurse, with her contaminated gloves, pulls the curtain shut with a quick tug. After completing the dressing change, she straightens the patient's bedding and gown and quickly throws her favorite roll of tape back into her uniform pocket as she leaves the room -- throwing her gloves into the trash.

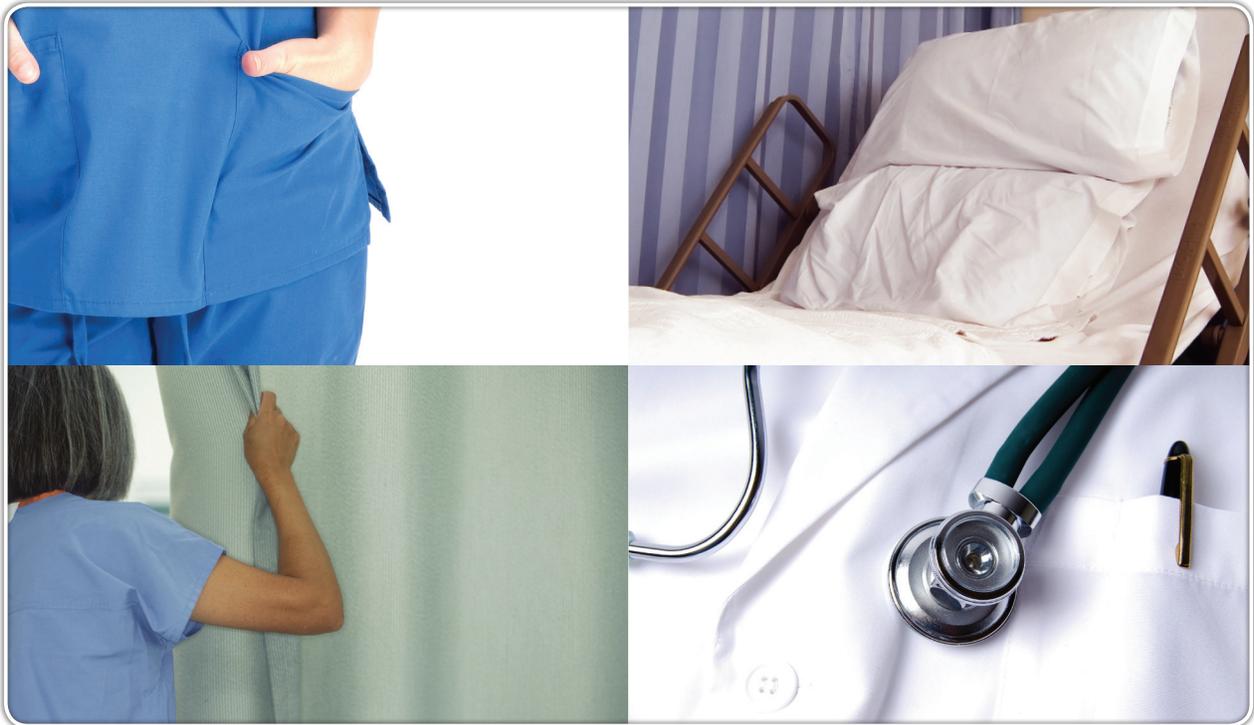
What the nurse is not considering in this scenario is cross-contamination between the patient and all of the fabric based surfaces. Not only has she potentially contaminated the curtain and her uniform pocket with bacteria from the MRSA infected patient, but she has also taken bacteria from those fabric surfaces - often called "soft surface textiles" - and introduced them back to the vulnerable patient with a contaminated glove.

Soft surface textiles, like other environmental surfaces, play an important role in the transmission of bacteria in the healthcare setting. They have been proven to act as "fomites" where organisms can grow and multiply. Even though they constitute 90 percent of the patient healthcare environment, they are often overlooked in everyday infection prevention practices.

THIS WHITE PAPER WILL DISCUSS THE ROLE OF SOFT SURFACE TEXTILES IN THE TRANSMISSION OF MICROORGANISMS IN THE HEALTHCARE SETTING. WE WILL:

- *Review the clinical studies demonstrating the issue of soft surface bacterial contamination.*
- *Examine the few guidelines and standards that address contaminated soft surface textiles.*
- *Discuss the ineffectiveness of laundering.*
- *Assess the role of soft surface textiles in the infection prevention "bundle" to decrease bioburden and transmission in the healthcare environment.*
- *Discuss some of the effective technologies available in antimicrobial soft surface textiles.*
- *Evaluate the antimicrobial role of silver historically as well as in current clinical applications.*
- *Discuss the antimicrobial effectiveness of fabrics powered by X-STATIC® antimicrobial technology in today's healthcare settings.*

DO BACTERIA LIVE ON SOFT SURFACE TEXTILES?



The potential for survival and spread of pathogens to and from humans and clothing or linens is shown by various laboratory studies. These studies show that survival does occur but varies considerably between different microbial strains and depends on factors such as temperature, relative humidity, type of fabric and inoculum size.

These studies show that gram positive spp. such as *S. aureus* and fungal spp. can survive long periods (several days to months) on fabrics. Although, gram negative spp. such as *Serratia marcescens* and *P. aeruginosa* are less resistant than gram positives to drying, survival is still sufficient to allow transfer to hands and other surfaces. In studies where survival on fabrics was compared with survival on non-porous surfaces, they suggest that survival times are generally less on porous surfaces. (1)

PRIVACY CURTAINS

- In a 2012 AJIC online published study, privacy curtains (43) in three different medical wards were swabbed during a 3 week period. Contamination with MRSA, VRE or aerobic gram negative rods was determined. To distinguish persistence of pathogens on curtains from recontamination, all VRE and MRSA were typed using pulsed field gel electrophoresis. Twelve of thirteen curtains (92%) placed during the study showed contamination within 1 week. Forty one of 43 curtains (95%) demonstrated contamination on at least one occasion, including 21% with MRSA and 42% with VRE. Eight curtains yielded VRE at multiple time points: three with persistence of a single isolate type and five with different types, suggesting frequent contamination. (2)

- In 1999, Palmer reported that of the 28 curtains sampled for bacteria, all plates yielded bacteria 22 of the 28 yielded, *Staphylococcus aureus*. (3)
- Klakus et al in 2008 concluded after culturing hospital curtains for MRSA that curtains are frequently handled both directly before and after examination of patients by healthcare workers, and are probably an overlooked vehicle for MRSA transmission within hospitals. (4)
- Trillis et al in 2008 found that 42% of privacy curtains in a US hospital were contaminated with VRE, 22% with MRSA and 4% with *C.difficile*. Hand imprint cultures demonstrated that these pathogens were easily acquired on hands. (5)

BED LINENS AND PATIENT GOWNS

Colbeck et al studied patients in 1956 suffering from *S. aureus* infections in a Canadian hospital. *S. aureus* was isolated from sheets of 11/12 infected patients.(6) Additional studies in which MRSA was isolated from clothing, mattresses, pillows, and bedding in situations where there was a patient infected with MRSA are described by Blythe et al. (1998), Rampling et al. (2001), Sexton et al. (2006). (7,8,9)

HEALTHCARE WORKER'S CLOTHING

IN RECENT STUDIES, HEALTHCARE WORKER'S CLOTHING HAS BEEN SHOWN TO BE COLONIZED WITH PATHOGENS:

- In 2001 Perry published that 52% of the nurses uniforms he cultured grew out MRSA and VRE. (10) A few years later, Osawa noted that 79% of the white coats he cultured grew out MRSA. (11)
- In another study out of Denver in 2011 by Cervantes et al., white coats and newly laundered short – sleeve uniforms of 100 residents and hospitalists on an internal medicine service in a university affiliated hospital were cultured during an eight hour work day. They found that bacterial contamination occurred within hours after donning newly laundered uniforms. Colony counts of these newly laundered uniforms were essentially zero but after just three hours of wear they were nearly 50% of those counted at eight hours. (12) With the minimal contact today's physician's actually have with patients and their body fluids, one would wonder how contaminated the certified nurse assistant's (CNA's) uniforms on that unit would be.

WITH THE MINIMAL CONTACT TODAY'S PHYSICIAN'S ACTUALLY HAVE WITH PATIENTS AND THEIR BODY FLUIDS, ONE WOULD WONDER HOW CONTAMINATED THE CERTIFIED NURSE ASSISTANT'S (CNA'S) UNIFORMS ON THAT UNIT WOULD BE.

- *In a more recent Israeli 2011 study published in AJIC by Wiener-Well et al., uniforms from 135 personnel including nurses and physicians were cultured. More than 60% of the hospital staff's uniforms were colonized with potentially pathogenic bacteria including drug resistant organisms. (13)*
- *In the study at the VCU School of Medicine, Gonzalo et al had 32 healthcare workers wear four pairs of identically appearing control scrubs and study scrubs impregnated with an antimicrobial over the course of four months, washing them regularly. Researchers conducted once weekly, unannounced, garment and hand cultures of participants at the start and end of each shift where they obtained two samples from the garment's abdominal area and cargo pant pocket . The antimicrobial scrubs were effective in reducing the burden of MRSA on healthcare worker apparel.(14)*

Once contaminated, uniforms and white coats can harbor pathogens for a long time. Neely and group summarized in the Journal of Clinical Microbiology in 2000 and 2001 multiple studies showing the survival of pathogens on fabric. They noted that MRSA in one study lived more than 20 days on cotton fabric and 40 days on polyester. The same holds true for VRE which survived more than 80 days on both fabrics. (15,16)

DOES CROSS-CONTAMINATION OCCUR?

- *Lidwell et al (1974) carried out a study in a single bed patient room of a UK hospital. During bed-making, strains of S. aureus carried on the nurses' external clothing were often transferred to the patients' bedclothes and their hands. (17)*
- *Dispersal of S. aureus from nurses clothing to patients was also demonstrated by Hambreus in 1973. (18)*

OUTBREAKS ASSOCIATED WITH SOFT SERVICE TEXTILES

A number of studies are reported in which transfer via soft surface textiles was identified as the possible cause of an infection outbreak. These include outbreaks associated with bacterial, fungal and also viral strains.

- *Das et al reported in 2002 of a multiple-antibiotic-resistant Acinetobacter baumannii that was first isolated from a patient in the general intensive care unit of a tertiary-referral university teaching hospital in Birmingham. Similar strains were subsequently isolated from 12 other patients, including those on another intensive care unit within the hospital. Environmental screening revealed the presence of the multiple-resistant Acinetobacter species on fomite surfaces in the intensive care unit and bed linen. The major source appeared to be the curtains surrounding patients' beds. Typing by pulsed field gel electrophoresis demonstrated indistinguishable isolates. (19)*

- *During an outbreak of MRSA in two wards of a medical school, Osawa et al reported in 2003 that there was a high probability of cross-infection between patients and the hospital staff in the ward. Their observations suggested that doctors and nurses should be cautious that their coats might be contaminated with the prevailing strains of MRSA. (11)*
- *Brunton (1995) describe a persistent outbreak of streptococcal infection associated with a maternity unit in a UK hospital. It was found that the vests given to newborn infants were laundered at the local hospital laundry rather than under the normal laundry contract. Sampling showed extensive contamination of the hot air dryers with the Streptococcus pyogenes strain involved in the outbreak. (20)*
- *Weernink in 1995 investigated increased numbers of isolations of Acinetobacter in a community hospital in The Netherlands. Feather pillows were found to harbor high numbers of Acinetobacter. In addition, a number of isolates from patients and from pillows were indistinguishable using biotyping, antibiogram typing and cell envelope protein typing. Replacement with synthetic pillows and correction of the laundry procedure resulted in a significant reduction of Acinetobacter isolations.(21)*
- *In a nosocomial outbreak reported by Shah et al, 13 staff and 11 patients in an acute and chronic health care facility were infected with Microsporium canis. The dermatophyte was apparently introduced into the facility by a single infected patient; the authors concluded that a likely mode of disease transmission was handling of contaminated laundry. Evidence of the fungus was found in stored linen. (22)*

INEFFECTIVENESS OF LAUNDERING

Since organisms live on fabrics for extended periods of time, we depend upon washing of soft surface textiles to decrease the bioburden. Washing can be effective when done properly, although standard practices are not always followed. In addition, laundering alone does not address the issue of recontamination of fabrics when put back in use.

- *In 2009 Markely and Edmond reported at the Society for Healthcare Epidemiology meeting, that of the 143 healthcare workers he interviewed, only one washed his white coat daily. Four (4) washed twice a week, 31 washed weekly, 30 every two days and 32 washed their white coats once a month or longer. (23)*
- *In a study in Great Britain in 2011, healthcare workers who washed their uniforms in domestic washing machines didn't kill all the MRSA and Acinetobacter. Ironing them was needed. (24)*

Laundry processes do reduce the microbial load on clothing and linens. During ineffective laundering, however, data indicates that transmission of pathogens to other items in the load can occur. These risks have been assessed in a number of studies:

- *In a 2009 study Exner and co-workers studied the hygiene effectiveness of machine laundry processes on cotton samples artificially contaminated with S. aureus. Although premium detergent (with bleach) cycles at 40°, 60° and 80°C produced an 8 log reduction in contamination, cycles at 30°C with liquid and gel detergents (without bleach and without prewash) produced only a 1-2 log reduction, and there was also cross-contamination between contaminated and sterile laundry samples that were included in the cycle.(25)*
- *In 1966 Kundsinn described a cross-contamination risk of household laundry following an investigation of an outbreak of S. aureus skin infections among families in Boston. A significantly higher prevalence of infection was found in families who used a community laundry with a lower water temperature compared with families who used their own washing machine. (26)*
- *Kennedy and co-workers carried out studies to determine to what extent bacteria inoculated onto cotton cloth swatches survived a detergent wash cycle at 20-23°C, and the extent to which contamination was transferred to sterile swatches. Bacteria strains were inoculated such that initial levels recovered from the swatch were of the order of 8.0-8.7 logs per 58 sq cm. Laundering produced a 2-3 log reduction in S.aureus, E. coli, S. typhimurium but, 4-5.75 log numbers were also recovered from the sterile swatches after laundering. (27)*

CURRENT GUIDELINES AND STANDARDS

Until recent years, little emphasis has been given in guidelines and standards to contaminated soft surface textiles and their role in bacterial transmission in healthcare settings. In addition, very little guidance has been given on antimicrobial technologies currently available in the market.

In the Center for Disease Control (CDC) 2003's "**Guidelines for Environmental Infection Control in HealthCare Facilities**" under the "Special Laundry Situations" section, it notes:

"Use caution when considering use of antimicrobial mattresses, textiles and clothing as replacement for standard bedding and other fabric items. EPA has not approved public health claims asserting protection against human pathogens for such treated surfaces."

This statement is still true today – almost 10 years later. It is still important to use caution when evaluating antimicrobial claims from manufacturers of soft surface textiles. Currently, EPA approves antimicrobial soft surface textiles as "non-public health."

CDC's Guideline for Isolation Precautions, published in 2007, note no mention of antimicrobial soft surface textiles. CDC does comment on laundering of garments used as PPE and uniforms that are visibly soiled with blood or infective materials. It said:

"... There are few data to determine the safety of home laundering of HCW uniforms but no increase in infection rates was observed in the one published study and no pathogens were recovered from home or hospital laundered scrubs in another study. In the home, textiles and laundry from patients with potentially transmissible infectious pathogens do not require special handling or separate laundering, and may be washed with warm water and detergent"

The evidence presented suggests that the above guideline is outdated. The most recent published guidelines on management of contaminated soft surface textiles is found in the 2011 **Perioperative Standards and Recommended Practices** from AORN – though there is no mention of antimicrobial soft surface textiles. They note in the section on “Surgical Attire”

“Wear freshly laundered surgical attire that is laundered at a health care accredited laundry...”

“..changing contaminated, soiled, or wet attire reduces the potential for contamination and protects personnel from prolonged exposure to potentially harmful bacteria”

“surgical attire should not leave the restricted area.....”

“...A study of home laundered uniforms involved taking surveillance cultures from five patients. Results showed that three of the patients were colonized with the same strain of microorganisms as that cultured from the healthcare providers uniforms.”

We’ve shown so far that soft surfaces in the healthcare environment are contaminated, cross-contamination does occur and laundering practices are not effective alone as recontamination happens quickly. Given the evidence, an update to current guidelines should be a priority as well as determining what evidence-based best practices and solutions should be recommended.

RESULTS SHOWED THAT THREE OF THE PATIENTS WERE COLONIZED WITH THE SAME STRAIN OF MICROORGANISMS AS THAT CULTURED FROM THE HEALTHCARE PROVIDERS UNIFORMS.

SOFT SURFACE TEXTILES IN THE “IP BUNDLE”

When bundled with other evidence based infection prevention strategies antimicrobial impregnated fabrics may limit the bacterial burden in the inanimate environment and thereby limit the spread of microorganisms. Studies have shown that “infectibility” is directly related to “dosage” so that the more germs in your environment , the higher the risk that those germs could end up as pathogens. An effective bundle to limit the “dosage” in the environment may include:

a. GOOD HAND HYGIENE PRACTICES

Under Standard Precautions, proper hand hygiene should be performed after contact with any body fluids or contaminated surfaces. To limit contamination of the environment, this should occur before any further contact with clean surfaces including soft surface textiles such as personal uniforms, patient linen and privacy curtains. Education of healthcare workers at orientation and again on a regular basis should remind them of the importance of preventing cross-contamination to clean surfaces- both hard surfaces and soft textiles- from contaminated hands.

b. EFFECTIVE CONTACT ISOLATION PRACTICES

When dealing with significant multi-drug resistant organisms (MDROs) or uncontrolled body fluid contamination in the environment, patients should be placed into CDC’s Contact Precautions. The proper signage and practices will help to minimize environmental contamination and make the healthcare worker more aware of additional risk of exposure and transmission.

c. PROPER LAUNDERING

As we've discussed we know organisms can live and proliferate on fabrics and we depend upon the healthcare workers to effectively wash their uniforms to remove the germs. Our best practices recommend that these fabrics be washed after each day's wear.

According to AORN, surgical attire should be laundered in a healthcare accredited laundry facility. These facilities are preferred because they follow standardized industry standards for proper disinfection of fabrics. The Healthcare Laundry Accreditation Council offers voluntary accreditation for those laundry facilities that process reusable healthcare soft surface textiles that incorporate OSHA and CDC guidelines. These standards include – but are not limited to:

- *Textile quality control procedures are defined and implemented.*
- *Soiled and contaminated textile areas are separated by a physical barrier.*
- *The ventilation is controlled with negative pressure in the soiled area, positive pressure from the clean textile area through the soiled textile area with 6 to 10 air exchanges per hour and air vented to the outside.*
- *Clean textiles are stored in an area free of vermin, dust and lint and at room temperature, between 68°F to 78°F.*
- *Storage shelves are one inch to two inches from the wall, the bottom shelf is six inches to eight inches from the floor, and the top shelf is 12 inches to 19 inches below the ceiling.*
- *Hand washing facilities are located in all areas with soiled textiles; hand washing or antiseptic dispensers are in the clean textile area, and employees perform hand washing according to CDC guidelines.*

Healthcare workers, outside of the operating room setting, tend to launder their uniforms at home. Importance of effective laundry hygiene at home needs to be further emphasized amongst healthcare workers. Uniforms should be laundered in a manner which not only renders them aesthetically clean, but also hygienically clean (i.e., free from pathogens). To achieve this, laundry products should be clearly labeled so that healthcare workers can understand whether, and under what laundering conditions, their laundry products can be expected to produce fabrics which are hygienically as well as visibly clean. This is achieved by a combination of heat, rinsing, detergent and chemical oxidative action.

There is also evidence to show that transfer of pathogens can occur between contaminated and clean laundry during the washing cycle. This concern may be related to the ambient water temperatures used today as well as the disappearing practice of ironing clothes. Dryers have added a slight margin of safety depending upon the temperature and the length of the drying time. However, it is important that healthcare workers are taught the importance of timely and effective washing of healthcare associated clothing to minimize the risk of transmission.

In addition to uniforms, bed linens, privacy curtains and patient gowns should be washed at an accredited laundering facility.

d. HARD SURFACE DISINFECTION

Environmental contamination of hard surfaces can occur after contact with body fluids or other contaminated surfaces. For example, a healthcare worker reaches across a patient’s bed and comes in contact with a dirty bed rail. Their uniform is at risk of cross- contaminating her hands and other inanimate surfaces later during her work shift or at home. To minimize cross-contamination to soft surface textiles, these surfaces should be disinfected properly with an EPA approved hospital grade disinfectant as soon as possible after they become unclean.

e. PROPER USE OF PPE

As with contaminated hands, contaminated gloved hands should not touch clean surfaces such as privacy curtains or the healthcare worker’s personal uniform. Staff should be reminded to not take items in and out of their uniform pocket with contaminated gloved hands (i.e tape, scissors, patient lists). Contaminated PPEs such as gloves, gowns and facial protection should be doffed safely as well as to not contaminate the healthcare worker’s personnel uniform or scrubs.

f. ANTIMICROBIAL SOFT SURFACE TEXTILES

By decreasing the bioburden on these fabrics, we can assume that we will decrease the risk of healthcare associated infections. Because laundering alone does not prevent recontamination, facilities need something that will continuously disinfect fabric surfaces for the life of the product with no additional labor or change in behavior.

IMPLEMENTING THE IP BUNDLE

According to OSHA’s Hierarchy of Controls, protection of employees from risks such as microorganisms and infection can be accomplished by implementing “controls.” Applying this hierarchy is a systematic approach to identify the most effective method of risk reduction. Healthcare workers should select the highest-level feasible control possible and then work through the other controls until the risk of exposure is mitigated. OSHA’s **Hierarchy of Controls** are:

- **ENGINEERING CONTROLS**
- **ADMINISTRATIVE CONTROLS**
- **SAFE WORK PRACTICES**
- **PERSONAL PROTECTIVE EQUIPMENT**



Let’s discuss these controls in relationship to the above IP Bundle suggested to minimize transmission of organisms in the environment.

Engineering controls are those physical changes to the work area or process that effectively eliminate or minimize a worker’s exposure to hazards. Typically these changes are “things” that leadership provides to the environment to eliminate the risk. These controls do not depend upon the healthcare worker doing the right process. In the case of environmental bioburden, an effective engineering control would be to provide antimicrobial soft surface textiles and antimicrobial hard surfaces. These surfaces would automatically kill microorganisms on their own – they don’t depend upon anyone or any process. Examples of these antimicrobial soft surface textiles would include patient

linen, patient gowns, privacy curtains, scrubs, uniforms and white coats. All of these over time would decrease the bioburden and minimize the risk. Hard surfaces might include doorknobs, hand rails, catheters and counter tops that are impregnated with an antimicrobial technology.

When engineering controls do not eliminate the risk you must then consider implementing administrative controls next. These controls do not include physical changes but limit daily exposure to the germs by limiting time exposure to contaminated surfaces, written operating procedures, and safety and health rules for employees. Placing the patient in Contact Precautions, for example, would be considered an administrative control.

If the hazards cannot be eliminated or minimized with the previous two types of controls, you must then implement “safe work” practices. These practices depend upon the employee to recognize the risk and follow evidence based practices. In our IP Bundle for the Environment, these include effective hand hygiene, laundering of soft surface textiles on a daily basis and successful disinfection of contaminated hard surfaces.

Last, but not least, when all the above controls fail to eliminate the risk, effective use of personal protective equipment should be implemented. This includes the proper use of gloves and gowns. Employees need to be able to recognize when body fluid contamination is present and only wear the PPEs when at risk of exposure. They also must recognize that when these contaminated PPEs are worn they must avoid contact with “clean” surfaces or fabrics. (i.e. touching privacy curtains or their clean scrubs) This cross-contamination leads to more contaminated surfaces.

If a healthcare environment included all of the above “Hierarchy of Control” steps, the risk of cross-contamination of the environment and people would be greatly diminished.

AVAILABLE SOLUTIONS FOR SOFT SURFACE BACTERIAL MANAGEMENT

A variety of technologies have been developed over the last few decades to add antimicrobial properties to soft surface textiles. Since EPA has not approved these products under their “public health” regulations to date, one will not see claims that the antimicrobial soft service textiles decreases healthcare associated infections. To be approved under EPAs “non-public health” regulations, these manufacturers have proven to:

- decrease microbial growth on the fabrics
- reduce degradation of the fabric over time
- control odor

EXAMPLES OF SOME OF THE ANTIMICROBIAL TECHNOLOGIES AVAILABLE ON SOFT SURFACE TEXTILES INCLUDE:

- **Silane-based quaternary ammonium chloride antimicrobial.** *Technology uses the coupling agent silane to attach the quaternary ammonium chloride to fibers. It has been added to a variety of fabrics including scrubs and lab coats.*
- **Chemical combinations** – *Multiple technologies using as many as 20 different chemicals in a variety of arrangements have been added to fabrics as antimicrobials.*
- **Copper Products** – *Historically, copper has been shown to be antimicrobial.. It is currently found in many homes as well as medical products.*

- **Silver Products**

- **Silver Zeolite** is a crystal based powder that is added as a coating, resin or additive to fibers. Silver is embedded within micron-sized carriers called zeolite and then encapsulated in the polyurethane surface of fabrics.
- **Silver nano technology** releases the antimicrobial silver ions in a steady rate from the fabrics.
- **Metallic Silver** is bonded to the surface of nylon fibers permanently. No silver ions are released into the environment.

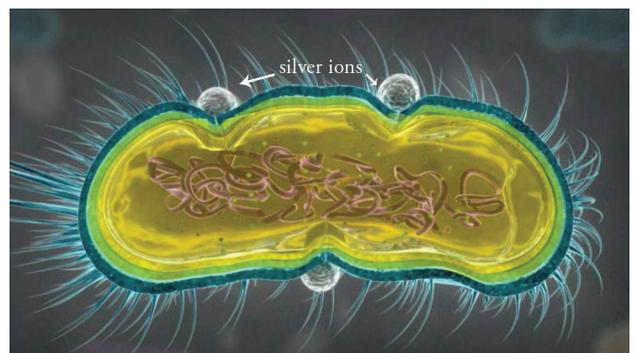
The fabrics that use conductive materials such as copper and silver help with temperature control as well. Healthcare workers wearing these materials tend to feel cooler in hot temperatures and warmer in cool temperatures.

SILVER AS AN ANTIMICROBIAL

The antimicrobial properties of silver have been known to cultures around the world for many centuries. The Phoenicians stored water and other liquids in silver coated bottles to discourage contamination by microbes. Hippocrates, the father of modern medicine, noted in the 4th century BC that silver had beneficial healing and anti-disease properties. Dairy men placed silver dollars into milk buckets to keep milk fresh. Some believe the definition of the phrase ‘born with a silver spoon in your mouth’ came from the middle ages when wealthy children were fed with silver spoons and observed to get sick less often and more apt to live to adulthood. Water tanks of ships and airplanes that are "silvered" are able to render water potable for months. In the 1880’s it became a common practice to administer drops of aqueous silver nitrate to newborn’s eyes to prevent the transmission of *Neisseria gonorrhoeae* from infected mothers to children during childbirth.

Once antibiotics were discovered, the use of silver as a bactericidal agent decreased. However, with the discovery of antibiotics came the emergence of antibiotic-resistant strains such as MRSA . Due to increasing antibiotic resistance, there has been a renewed interest in using silver as an antibacterial agent.

Although, the antimicrobial mechanism of silver has been known for centuries, we have only recently begun to understand the mechanisms by which silver inhibits bacterial growth. In order for silver to have any antimicrobial properties, it must be in its ionized form. Silver in its non-ionized form is inert, but contact with moisture leads to the release of silver ions. The antimicrobial mechanism of silver is not completely understood it is thought to interact with the bacterial peptidoglycan layer, form pits in the cell wall, change membrane polarity, form free radicals that damage the membrane, or a combination of these effects. Silver does not act via cell receptors therefore



there is no immune response and thus no antibacterial resistance. Because of these antimicrobial properties, silver technology today has been incorporated into surgical instruments, catheters, hospital wound dressings, and a wide variety of consumer products, such as washing machines, food storage containers, bandages, water tanks, refrigerators and clothing.

THE RIGHT SOLUTION

X-STATIC® antimicrobial technology, produced by Noble Biomaterials, Inc., has been used in a variety of textiles for its antimicrobial properties since 1999. It is used by NASA, the United States Military and Olympic athletes. The technology has also been used in products for treating wounds and burns more than seven years by brands such as KCI and Systagenix.

X-STATIC® technology uses pure metallic silver permanently bonded as a thin uniform coating on the surface of a flexible polymer. It does not change the properties of the underlying material. The antimicrobial properties are inherent in the fabric and active for the life of the product. Within one hour of contact of the fabric, 99.9% of the bacterial and fungal organisms will be reduced. With this technology, no metallic silver is released – only silver ions. These silver ions continuously release throughout the life of the product, naturally inhibiting and reducing contamination. Because X-STATIC’s silver is woven directly into the product, patient and staff compliance issues are eliminated.

In a clinical trial conducted in the UK, on the “See it SAFE” line of products powered by X-STATIC, “66.7% of patients in the silver fabric active group eradicated MRSA while 0% eradicated MRSA in the control group. The use of “See it SAFE” X-STATIC fabric is superior to current eradication protocols against heavily contaminated patients” (28). In another study of privacy curtains powered by X-STATIC, at QMC Hospital in the U.K. in 2008, it revealed “MRSA Contamination was found in 63% fewer silver-impregnated curtains than in control curtains.” (29)

X-STATIC® is currently available in healthcare for environmental isolation, lab coats and support surfaces such as privacy curtains, scrubs, bed linens and cubicle curtains..

Please visit www.InfectionPreventionTextiles.com for more information.

CONCLUSION

There is a void in our everyday infection prevention practices. With healthcare associated infections causing nearly 100,000 deaths annually and costing the healthcare system 6.5 billion dollars, we simply can’t afford to ignore soft surface bacterial management in the IP bundle.

We need to think about strategies to reduce the potential transfer of bacteria from soft surfaces to patients. The most intuitive, common sense strategy is to wash hands after pulling the curtain and before touching the patient. Another strategy is frequent disinfecting, but this would involve more chemicals and the possibility of creating microbial resistant fabrics. Laundering alone is clearly not the answer.

It is time to take a look at the technologies that have been developed in the past decade and the potential benefits associated with infection prevention textiles as a permanent and continuous solution. The industry needs to invest time and money in completing the necessary clinical studies and creating evidence based practices and guidelines for soft surface bacterial management.

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