VESTEX® - Frequently Asked Questions

EFFECTIVENESS

How Does Vestex Work?

- A **dual mechanism of action** makes Vestex different from any other “antimicrobial” textile on the market. Bacteria are highly adherent organisms and the Vestex fluid barrier plays a crucial role in reducing the number of organisms on the garment:
  1. The first step to preventing the acquisition and retention of contamination on textiles is a fluid barrier. A fluid repellent is the primary barrier to organism acquisition. As the contaminated fluids are repelled, the numbers of organisms that remain on the fabric are significantly reduced. This reduction in the number of organisms also decreases the exposure time antimicrobials require in order to kill the germs.
  2. The second mechanism of action is the possible direct antimicrobial effect of the antimicrobial agent which has been ascribed to several possible mechanisms, including disruption of the cell membrane, denaturation of cell surface and transmembrane proteins, and inactivation of bioenergetic systems.

Are All Antimicrobial Scrubs the Same?

- No. Only Vestex (VTT003) has had its performance verified in a clinical trial and published in a peer reviewed medical journal.
- Because of the unique, dual mechanism of action, **study results for VTT003 (Vestex) are not translatable to single-action antimicrobial fabrics**. Without a fluid barrier in place to shed bulk contaminant, it is likely that any antimicrobial would be overwhelmed and rendered ineffective by the amount of the contaminant saturating the fabric.
- Consistent with the description of Rutala & Webber, a fluid barrier decreases the exposure time required to kill the bacterial inoculum. The fluid barrier also decreases the aggregation of bacterial cells in the fluid suspension, allowing greater antimicrobial activity on monodispersed cells. Without the hydrophobic barrier, organic material from blood, secretions and other body fluids can interfere with an antimicrobial agent embedded in the textile by forming a complex that reduces its activity.
- Metals (silver and copper) and triclosan have been shown to leach from or leave the fabric surface or have been shown to cause bacterial resistance and therefore have human and environmental safety concerns.
Will Vestex Reduce infections?

- Studies of isolation gowns have shown reductions in infection rates.
- Bearman et al state: “The antimicrobial scrubs tested were associated with decreased MRSA apparel microbial bioburden. When bundled with known infection prevention strategies such as hand hygiene, antimicrobial impregnated apparel may limit the bacterial burden of the inanimate environment. For settings with high rates of hospital-acquired infections with drug-resistant pathogens such as MRSA, the use of antimicrobial apparel may be a useful adjunct to other infection prevention measures.”
- Most infection prevention strategies focus on reducing bioburden which was shown in the VCU clinical trial. The design requirements of a study to show a reduction in infection rates with Vestex would be nearly impossible to prove.

Is Vestex Effective Against Organisms Other Than MRSA?

- Yes, the antimicrobial in Vestex has been shown to be effective against a very broad spectrum of organisms throughout the years.
- Bearman et al state: “Previously, Vestex-treated fabric demonstrated in vitro activity against S. aureus, MRSA, K. pneumoniae (carbapenemase resistant), multidrug-resistant A. baumannii, and Clostridium difficile. Thus, the absence of an observed impact on VRE and GNR microbial burden by study scrubs may reflect the already low baseline HCW apparel exposure to these pathogens and is not necessarily a reflection of a reduced antimicrobial effect.”

Do Textiles Really Cause Infection?

- No, microbes cause infections when the inoculum size of a given organism overwhelms host defenses of susceptible persons.
- Bearman and colleagues report: “Study scrubs (Vestex) were associated with a 4–7 mean log (99.99%) reduction in MRSA burden but not VRE or GNRs.”
- It is important to note that the primary goal of infection prevention practice is not a sterile environment, or zero bioburden, but to use techniques that significantly reduce bioburden to sub-clinically relevant levels.
- In fact, the study points out: “Hospital textiles may contribute to the transmission of pathogens through indirect contact via the hands of hospital staff and by means of aerosols.”

The better question is “Can the microbes carried on textiles cause infection?”

- Yes – This is why personal protective gowns, isolation gowns and surgical gowns have been a corner stone of infection prevention for many years. Microbes carried on textiles do cause infections in healthcare workers and patients. Several outbreak reports have documented links to textile surfaces as a source of outbreaks.
- The increase in Multi Drug Resistant Organisms (MDRO) in the community combined with more invasive procedures being done at the bedside and in the outpatient setting means that more virulent organisms surround us outside of the hospital.
• Healthcare worker garments are the most mobile fomites, or reservoir of pathogens, in the healthcare environment.

Why was No Impact Seen on HCW Hand Positive Cultures?

• There was no difference observed in hand mean log CFU count for MRSA (12.37 mean log CFU in control arm vs 12.28 mean log CFU in study arm; P=0.93), VRE (negative cultures for both control and study arms), or GNR (12.88 mean log CFU in control arm vs 10.72 mean log CFU in study arm; P=0.26) when wearing study versus control scrubs (Table 6).
• Even with a very high overall hand hygiene rate of 78%, HCW hands still had as many log CFU of MRSA as untreated scrub uniforms.
• Though the hands of HCW wearing Vestex study scrubs had as high as 12.28 log CFU MRSA, the Vestex scrubs had statistically significantly less MRSA on the leg cargo and abdominal pocket areas.
• Even though HCW hands were washed many, many times throughout the shift, the HCW hands were still significantly more contaminated than the high touch areas of the Vestex uniforms.

SAFETY

Is Vestex Safe To Wear?

• No erythema or rash was reported in the VCU study.
• The safety of Vestex was confirmed by Tom Walsh, MD, and colleagues and presented at the Emergency Nurses Association meeting in 2011.
• The researchers found: “Textiles impregnated with the Vestagen antimicrobial passed both standard tests for evaluating the safety of products used in the health care setting. Although further testing of Vestagen’s antimicrobial is warranted, the results of this study show that the textiles do not exhibit cytotoxic effects on the epidermis of the wearer. Therefore it is plausible that due to their safety, textiles with Vestagen’s antimicrobial impregnation may reduce the transmission of contaminants, and pathogens for HCWs in the ED.”

Will Vestex Cause Antimicrobial Resistance?

• The action of antibiotics and the action of disinfectants differ fundamentally.
• Tolerance to disinfectants may develop in response to disinfectant exposure; however, the level of tolerance is not important in clinical terms because it is low and unlikely to compromise the effectiveness of disinfectants, which are used in much higher concentrations than antibiotics.

DURABILITY and COST

How Long Does It Last?

• Vestex technologies are impregnated into the fabric at the fiber level:
  ○ technologies are permanently affixed to the fibers - the technologies won’t rub off
this preserves inter-fiber space which allows for vapor transmission from the skin – it is breathable and comfortable to wear

- Independent laundry testing verifies “like new” performance of Vestex technologies after 50 industrial healthcare washings which is equivalent to 125 home laundering cycles.
- Healthcare industry standard data report that untreated scrub uniforms have an effective use of only 25-30 wash cycles.

How Much Does Vestex Cost and How Can We Purchase?

- The superior performance of Vestex typically costs only a few dollars more than untreated scrub uniforms.
- Cost benefit and cost effectiveness of Vestex have been studied by the Lewin Group and the University of Central Florida Medical School. The authors have found the use of Vestex to be advantageous citing:
  - the increased durability and extended use-life of Vestex vs. traditional scrub uniforms
  - the potential for infection prevention
  - enhanced employee safety
  - benefits of building an institutional culture of safety and risk mitigation
  - enhanced institutional and professional branding and image enhancement
- Ordering details can be found at www.vestexprotects.com.

Can Vestex Technology be used for Other Applications?

- Physicians, Dentists, Veterinarians, Nurses and Medical Support Staff, Laboratory and Pharmacy Staff, Emergency First Responders and Patient Transport Workers, Food Service and Food Processing Workers, and Environmental Services Workers may all benefit from Vestex protection.

Recently Published Medical Literature on the Problem of Contaminated HCW Uniforms

- The Otter article (Infection Control and Hospital Epidemiology, July 2011) reviews the literature and finds:
  - There is now compelling evidence that contaminated surfaces make an important contribution to the epidemic and endemic transmission of C. diff, VRE, MRSA, Acinetobacter baumannii, etc.
- The Burden study (Journal of Hospital Medicine, March 2011) documents:
  - Contamination of even freshly laundered scrub uniforms occurs within hours of the start of the shift.
  - At the end of the 8 hour shift, there was no significant difference in contamination between freshly laundered uniforms and (not freshly laundered) lab coats.
- The Wiener-Well study (American Journal of Infection Control, September, 2011) finds:
  - Up to 60% of hospital staff’s uniforms are colonized with potentially pathogenic bacteria, including drug-resistant organisms.
  - Acinetobacter baumannii was the most frequently isolated organism.
• *Staphylococcus aureus* was the second most isolated organism – one third of these were MRSA.

**Implications**

• Healthcare Worker Uniforms are contaminated.

• Healthcare workers are at risk of exposure to blood, bodily fluids and other contaminants.

• We can conclude that Vestex uniforms may reduce the bioburden of the clinical environment.

• Vestex Active Barrier Protective Apparel can play a role in a multi-modal, bundled approach to infection control.

• Healthcare worker safety = patient safety. As institutions demonstrate their commitment to safety by protecting healthcare workers, the culture of safety is enhanced and translates into patient safety.

**Disclaimer**

The ability of Vestex® to reduce MRSA or other microbial bioburden on garments has not been shown to correlate with any clinical event or to be able to reduce patient infections. Clinical studies to evaluate reduction in infection have not been performed. The antimicrobial agent used in Vestex® is EPA registered to guard against the degradation of the fabric from microorganisms and to retard the growth and action of odor causing bacteria.