Vancomycin-Resistant Enterococci: VRE

Situation:

Infectious diseases caused by drug-resistant organisms are a major and costly public health problem. Resistant infections are associated with increased morbidity, prolonged hospital stays, greater direct and indirect costs, prolonged periods during which individuals are infectious, and greater opportunities for the spread of infection to other individuals.

This document will help you and decision makers to better understand the basic infection control principles of controlling the transmission of VRE in healthcare settings.

Background:

Enterococci are a normal part of the human gastrointestinal and vaginal flora. Although not especially virulent, Enterococci have become the second most common nosocomial pathogen and are the third leading cause of nosocomial bloodstream infections. Enterococci are intrinsically resistant to many common antibiotics. Given the intrinsic resistance of Enterococci to most antibiotics, the addition of vancomycin resistance has meant many infections have become untreatable. Even with the use of second and third line antibiotics, the outcome from VRE infections is often very poor.

VRE Epidemiology:

Because Enterococci are part of the normal flora of the GI tract and vaginal tracts, most infections with these microorganisms have been attributed to the patients’ endogenous flora. The epidemiology of VRE varies from hospital to hospital depending on the hospital size, patient population, antibiotic usage patterns and geographic location. VRE is spread by both direct and indirect contact. Modes of indirect contact have included transient carriage on healthcare workers hands, contaminated equipment and / or contaminated environmental surfaces. Enterococci can persist for weeks on
environmental surfaces; thus, environmental surfaces may serve as a potential reservoir for nosocomial transmission of VRE.

**Prevention and Control of VRE:**

Aggressive infection control measures and strict compliance by hospital personnel are required to limit the nosocomial spread of VRE. Eradication of VRE from the hospital is most likely to succeed when VRE infection or colonization is confirmed to a few patients on a single ward. Once VRE has become endemic on a ward or has spread to multiple wards or to the community, eradication becomes extremely difficult and costly. Careful cleaning of patient rooms and medical equipment contributes substantially to the overall control of VRE. VRE is susceptible to several Health Canada registered low- and intermediate-level disinfectants (e.g., alcohols, sodium hypochlorite, quaternary ammonium compounds, phenolics, and hydrogen peroxide based disinfectants) at recommended use dilutions for environmental surface disinfection. The use of stronger solutions of disinfectants for inactivation of VRE is not recommended based on the organisms’ resistance to antibiotics.

Multiple epidemiological studies have implicated fomites in VRE transmission. Equipment which is frequently shared (stethoscopes, blood pressure cuffs, electronic thermometers and IV poles) must be dedicated for use for each VRE patient only. Only limited quantities of disposable supplies should be brought into the room. Any equipment that cannot be dedicated (pulse oximeter etc) must be adequately cleaned and disinfected immediately after use with a Health Canada approved disinfectant. Gross soiling must be removed by cleaning before applying the disinfectant. Additionally, the disinfectant must be left on the equipment for the appropriate contact time in order to be effective. *A simple spray and wipe does not constitute appropriate disinfection for patient care equipment potentially contaminated with VRE.*

Cleaning of VRE infected / colonized patients must be cleaned thoroughly and disinfected daily. Using a Health Canada approved hospital grade disinfectant with VRE claims, special attention should be paid to environmental surfaces: bed rails, bedside tables, doorknobs, faucet handles, bedside commodes, horizontal work surfaces in the room, wheelchairs and other assistive devices. Gross soiling must be removed before the application of the disinfectant. For the disinfectant to be effective, the appropriate contact time must be used. *A simple spray and wipe is not adequate and will lead to the persistence of VRE in the environment.*

**Use of AHP in the Prevention and Control of VRE:**

Accelerated Hydrogen Peroxide when used at the 0.5% concentration is a very good cleaner and is very effective at killing VRE. Unlike most disinfectant products, AHP is a very good cleaner and carries a 30-second Broad-Spectrum Sanitizing claim that provides a 5-Log reduction (99.999% kill) against VRE. This means that in 30-seconds the
surface has been rendered safe to use. Allowing the surface to remain wet for 5-minutes provides a 6-Log reduction (99.9999% kill) required to achieve terminal disinfection.

**In Summary:**

- VRE is a vegetative bacteria that is a normal part of the human GI tract, female genital tract and the mouth
- VRE is neither more infectious nor more virulent than susceptible enterococci, but it is a challenge because treatment options are limited to combinations of antimicrobials with unproven efficacy
- VRE can survive for days to weeks on environmental surfaces
- **Accelerated Hydrogen Peroxide surface and device products carry a 30-second sanitizing claim and a 5-minute Bactericidal claim against VRE. You and your clients should have full confidence in its efficacy and ability to inactivate VRE**