

## Vancomycin Resistant Enterococci (VRE)

*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 to most antibiotics, the addition of vancomycin resistance has meant that many infections have become untreatable.*

### Bacteriology

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VRE stands for vancomycin resistant enterococci. These are bacteria that have developed a resistance to most antibiotics commonly used for enterococcal infections. The antibiotics include vancomycin, aminoglycosides, and ampicillin. Enterococci are bacteria that are normally present in the human intestines, the female genital, in the environment and less commonly the oral cavity.. This species of bacteria are facultatively anaerobic, catalase-negative Grampositive cocci that are generally arranged individually, in pairs, or short chains. The optimal temperature for growth of *E. faecalis* and *E. faecium* is 35°C.

### Clinical Manifestations

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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. Most commonly attributed infections to VRE include urinary tract infections, bloodstream infections, or infections of wounds associated with catheters or surgical procedures.

Risk factors associated with VRE infection include; previous treatment with vancomycin or other antibiotics for long periods of time, extended periods of hospitalization, weakened immune systems such as patients in intensive care units, or in cancer or transplant wards, surgical procedures such as abdominal or chest surgery and indwelling medical devices such as urinary catheters or central intravenous (IV) catheters.

### Epidemiology of Transmission

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Because enterococci are part of the normal flora of the gastrointestinal and female genital tracts, most infections with these microorganisms have been attributed to the patient's own flora. Antibiotic exposure plays an important role in the transmission dynamic of VRE. People who have been previously treated with vancomycin are at the highest risk for developing VRE. VRE can also be spread from person-to-person by direct patient-to-patient contact, or indirectly on health care workers' hands, or on contaminated environmental surfaces and patient-care equipment. The unrecognized colonized patient also presents a particular risk for transmission to other patients.

## Basic Prevention

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The importance of hand hygiene in the elimination of VRE transmission cannot be overstated. Hands should always be washed thoroughly after using the bathroom and before preparing food as well as after contact with persons who have VRE. Alcoholbased hand sanitizers ( $\geq 62\%$  ethanol) may be helpful as an adjunct method of hand hygiene, but should not replace washing with soap and water. Additional prevention measures include; frequent cleaning areas of the home, such as bathrooms, that may become contaminated with VRE and wearing gloves if hands may come in contact with body fluids that may contain VRE, such as stool or bandages from infected wounds.

## Prevention Measures

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In addition to Routine / Standard Precautions, Contact Precautions should be implemented with patients who are suspected or confirmed to have VRE.

- Patients with suspected or confirmed VRE may be placed in private rooms or cohort with other patients with the same infection.
- Follow hand-hygiene guidelines by either carefully washing hands with soap and water or using Alcohol-Based Hand Sanitizers (ABHS) after contact with patients with VRE infection
- Use gowns and gloves when in contact with, or caring for patients who are symptomatic with VRE for all interactions that may involve contact with the patient or potentially contaminated areas in the patients environment
- Dedicated equipment for patient care should be utilized whenever possible (disposable stethoscopes, thermometers, BP cuffs, etc)
- Limit the type and amount of supplies entering the room and dispose of all unused items at patient discharge

## Environmental Control Measures

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VRE can grow and survive in harsh environments, and can persist almost anywhere including soil, plants, water, and food. It has been shown to survive 5 days to 4 months on dry inanimate surfaces. Once VRE has become endemic on a ward or has spread to multiple wards or to the community, eradication becomes extremely difficult and costly.

Hospital-grade cleaning and disinfecting agents are sufficient for environmental cleaning in the context of VRE. All horizontal and frequently touched surfaces should be cleaned twice daily and when soiled. The healthcare organization's terminal cleaning protocol for cleaning of the patient's room following

discharge, transfer or discontinuation of Contact Precautions should be followed. All patient care equipment (e.g., thermometers, blood pressure cuff, pulse oximeter, etc.) should be dedicated to the use of one patient. All patient care equipment should be cleaned and disinfected as per Routine / Standard Practices before reuse with another patient or a single use device should be used and discarded in a waste receptacle after use. Toys, electronic games or personal effects should not be shared by patients.

## References:

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1. Public Health Agency of Canada (PHAC), Material Safety Data Sheet – Infectious Substances: Enterococcus faecalis.  
<http://www.phac-aspc.gc.ca/lab-bio/res/psds-ftss/enterococcus-eng.php>
2. Guidelines for Environmental Infection Control in Healthcare Facilities, CDC. MMWR June 2003, Vol 52, No RR-10
3. Best Practices for Cleaning, Disinfection and Sterilization in All Health Care Settings, Provincial Infectious Diseases Advisory Committee (PIDAC), February 2010
4. Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, HICPAC, 2007
5. Management of Multidrug-Resistant Organisms In Healthcare Settings, HICPAC, 2006