Vancomycin Resistant Enterococci (VRE)

Cause/Epidemiology

Enterococci are facultative anaerobic gram-positive cocci that inhabit the gastrointestinal tract of human hosts. They are extremely hardy, and have the ability to survive in a multitude of growth conditions. Enterococcus faecalis and Enterococcus faecium are the most clinically relevant and prevalent enterococcal isolates.

VRE were initially reported in Europe in 1986, occurring in animal and community reservoirs. The first report of VRE outside the healthcare setting was from sewage treatment plants. From the late 1980’s to mid 1990’s the rate of VRE isolates increased 34-fold due in large part to intensive care unit hospitalizations; increases have also been identified in the general medical/surgical hospitalized population.

Clinical Presentation

The lower intestinal tract is the most frequently colonized site and enterococci are a common cause of urinary tract infections. Enterococcal bacteremia has become more common within recent years. Enterococcal endocarditis is a common cause of bacteremia, accounting for up to 20% of valve infections. Enterococci also causes intraabdominal and pelvic abscesses. Intraabdominal abscesses in liver transplant patients have become quite problematic. Surgical site infections are also a source of secondary enterococcal bacteremias.

Incubation

The incubation period is variable and indefinite. Occurs commonly around 4 - 10 days after exposure.

Transmission

Transmission occurs by direct contact on hands of healthcare workers and by indirect contact with inanimate objects or environmental surfaces (e.g., lift slings, bedrails).

The risk factors in acquiring VRE are
- Immunocompromised resident
- Transplant recipient
- Severity of underlying illness
- Renal insufficiency
• Enteral feedings
• *Clostridium difficile* diarrhea
• Major burns
• Intensive care unit admission
• Multiple unit stays
• Proximity to a patient with VRE
• Number, type, and duration of antibiotic therapy
• Prior antimicrobial use (e.g., vancomycin, third generation cephalosporins, anti-anaerobic antibiotics- clindamycin, fluoroquinolones-ciprofloxacin)
• Preoperative bowel preparations
• Invasive procedures
• Prolonged hospitalization

VRE may inhabit a host and cause no discernable problems. Colonization with the organisms can occur as a result of the conditions presented above.

VRE colonization is considered indefinite. Therefore, once a resident is colonized with VRE, they will always be colonized with VRE.

VRE infection can occur throughout the body with the most common body sites being the urinary tract, surgical wounds, and/or bloodstream.

Disease mortality from VRE is approximately twice that of vancomycin sensitive enterococcal (VSE) (36.6% with VRE versus 16.4% with VSE).

VRE is easily transmitted from colonized/infected residents or contaminated inanimate objects to health care workers' hands. If health care workers provide care for other residents without performing hand hygiene, VRE can be transmitted.

**Infection Prevention and Control Practices**

Routine Practices.
Implement Contact Precautions when there will be contact with infected/colonized body site i.e.: if the resident is incontinent, has an iliostomy and/or colostomy, has diarrhea or has wound drainage not contained by a dressing. Refer to the table Management of Communicable Diseases in Personal Care Homes for specific disease/microorganism information. Refer to Contact Precautions in the Additional Precautions section.

**Occupational Health**
Definition of Occupational Exposure
A healthcare worker who has had direct or indirect contact with feces, urine, wound drainage, or areas of colonized skin of an infected or colonized person during the period of communicability, which varies widely, but continues for as long as the carrier state persists.

A Healthcare Worker Exposed to VRE
- No modifications to work practices or work restrictions required
- Healthcare worker specimens for culture are not routinely obtained

Healthcare Worker who is Symptomatic or Infected with VRE
- Physician confirmed diagnosis
- Inform Infection Prevention and Control immediately if suspected or confirmed case of VRE
- Healthcare workers shall be referred to Occupational Health/designate for clinical management
- Healthcare workers colonized with VRE has no modification or work restrictions required
- Healthcare workers colonized with VRE and has diarrhea shall be excluded from work until diarrhea is resolved