Test Definition: VRERP

Vancomycin-Resistant Enterococcus, Molecular Detection, PCR, Varies

Overview

Useful For
Identifying carriers of vancomycin-resistant enterococci

Highlights
This test detects the presence of either *vanA* or *vanB*, which confer vancomycin resistance in *Enterococcus faecalis* and *Enterococcus faecium* (and occasionally other organisms).

Method Name
Real-Time Polymerase Chain Reaction (PCR)

NY State Available
Yes

Specimen

Specimen Type
Varies

Necessary Information
Specimen source is required.

Specimen Required
The high sensitivity of amplification by polymerase chain reaction requires the specimen to be processed in an environment in which contamination of the specimen by vancomycin-resistant *Enterococcus* DNA is unlikely.

Submit only 1 of the following specimens:

Preferred:
Specimen Type: Perianal, perirectal, rectal, anal
Supplies: Culturette (BBL Culture Swab) (T092)
Container/Tube: Culture transport swab (Dacron or rayon swab with aluminum or plastic shaft with either Stuart or Amies liquid medium)
Specimen Volume: Swab
Specimen Stability Information: Refrigerated (preferred)/Frozen

Acceptable:
Specimen Type: Preserved feces
Supplies: Culture and Sensitivity Stool Transport Vial (T058)

Container/Tube: Commercially available transport system specific for recovery of enteric pathogens from fecal specimens (15 mL of non-nutritive transport medium containing phenol red as a pH indicator, either Cary-Blair, Para-Pak C and S vial)
Specimen Volume: Representative portion of feces
Collection Instructions:
1. Collect fresh feces and submit 1 gram or 5 mL in container with transport medium.
2. Within 2 hours of collection, place feces in preservative.
Specimen Stability Information: Ambient (preferred)/ Refrigerated

Specimen Type: Unpreserved feces
Supplies:
-Stool Container, Small (Random), 4 oz Random (T288)
-Stool Collection Kit, Random (T635)
Container/Tube: Fecal container
Specimen Volume: Representative portion of feces
Collection Instructions: Collect fresh fecal specimen and submit representative sample in fecal container.
Specimen Stability Information: Refrigerated (preferred)/Frozen

Forms

If not ordering electronically, complete, print, and send a Microbiology Test Request (T244) with the specimen.

Specimen Minimum Volume

See Specimen Required

Reject Due To

E-swab, calcium alginate or, cotton-tipped swab Swab sent in gel transport medium, viral or universal transport medium Dry swab Formalin or PVA fixative	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container

Varies	Varies		

Clinical & Interpretive

Clinical Information

Vancomycin-resistant enterococci (VRE) are major nosocomial disease-causing bacteria. Patients who are particularly vulnerable to fatal disease from VRE include those with hematologic malignancies and liver transplants. Nosocomial spread of VRE occurs as the result of fecal carriage. Risks for both colonization and infection include prolonged hospitalization, intensive care unit stay, transplantation, hematologic malignancies, and prolonged exposure to antibiotics.

The Centers for Disease Control and Prevention provides recommendations to prevent the spread of VRE in institutional settings. These recommendations include isolation of patients experiencing active VRE infection, screening of patients by perianal swab or fecal testing to identify carriers of VRE, and subsequent isolation or cohorting of VRE carriers. Identification and isolation of VRE carriers has been shown to be cost-effective.

In *Enterococcus faecalis* or *Enterococcus faecium*, vancomycin resistance is usually associated with the presence of *vanA* or *vanB*. The presence of these genes is detected by a molecular method in this assay.

Reference Values

Negative

Interpretation

Positive test results indicate the presence of either *vanA* or *vanB*, which confer vancomycin resistance in *Enterococcus faecalis* and *Enterococcus faecium* (and occasionally other organisms). Patients with a positive test result should be placed in isolation or with other vancomycin-resistant enterococci (VRE) carriers according to the institution's infection control practices.

A negative result indicates the absence of detectable *vanA or vanB* DNA but does not rule-out carrier status and may occur due to inhibition of polymerase chain reaction (PCR), sequence variability underlying primers or probes, or the presence of VRE DNA in quantities less than the limit of detection of the assay. In the rare event that PCR testing appears to be negative but there is evidence of PCR inhibition, the result will read "PCR inhibition present." In such cases, a new specimen should be submitted for repeat testing.

Cautions

A positive result does not imply the presence of vancomycin-resistant enterococci (VRE) disease; the presence of *vanA* or *vanB* correlates with colonization by VRE. Colonization with VRE is not associated with any signs or symptoms.

vanA or v*anB* may occasionally be found in organisms other than enterococci.

Supportive Data

Perianal swabs (894) were evaluated for the presence of *vanA* or *vanB* DNA by the vancomycin-resistant enterococci (VRE) polymerase chain reaction (PCR) assay and compared to culture using selective and differential media. Compared to culture the VRE PCR assay was 98% sensitive and 98% specific. The VRE PCR assay detected 35 more positive

specimens than the culture method. No cross-reactivity was seen when tested on a panel of disease-causing and normal microbiota bacteria of the gastrointestinal tract. *Enterococcus* species containing the *vanC* gene were not detected with the VRE PCR assay.

Clinical Reference

1. Procop GW, Church DL, Hall GS, et al. Gram-positive cocci, Part II: Streptococci, Enterococci, and the "Streptococcus-like" bacteria. In: Koneman's Color Atlas and Textbook of Diagnostic Microbiology. 7th ed. Wolters Kluwer Lippincott Williams and Wilkins; 2017:801-804
2. Mayo Medical Laboratories Communique: Vancomycin-resistant enterococci: Colonization, infection, detection, and treatment. Vol 32, No. 11, November 2007
3. Zirakzadeh A, Patel R. Epidemiology and mechanisms of glycopeptide resistance in enterococci. Curr Opin Infect Dis. 2005;18(6):507-512. doi:10.1097/01.qco.0000186849.54040.2a
4. Zirakzadeh A, Patel R: Vancomycin-resistant enterococci: colonization, infection detection and treatment. Mayo Clinic Proc. 2006;81(4):529-536. doi:10.4065/81.4.529
5. Patel R. Enterococcal-type glycopeptide resistance genes in non-enterococcal organisms. FEMS Microbiol Lett. 2000;185(1):1-7. doi:10.1111/j.1574-6968.2000.tb09032.x

Performance

Method Description

Bacterial DNA is extracted from the specimen. Using the LightCycler instrument and fluorescent energy transfer probes, *vanA* and *vanB* genes responsible for vancomycin resistance in enterococci are detected directly from perianal swabs or fecal specimens.(Sloan LM, Uhl JR, Vetter EA, et al. Comparison of the Roche LightCycler *vanA*/*vanB* detection assay and culture for detection of vancomycin-resistant enterococci from perianal swabs. J Clin Microbiol 2004;42[6]:2636-2643. doi:10.1128/JCM.42.6.2636-2643.2004; Hefazi M, Damlaj M, Alkhateeb HB, et al. Vancomycin-resistant Enterococcus colonization and bloodstream infection: prevalence, risk factors, and the impact on early outcomes after allogeneic hematopoietic cell transplantation in patients with acute myeloid leukemia. Transplant Infect Dis. 2016;18[6]:913-920. doi:10.1111/tid.12612)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

1 to 4 days

Specimen Retention Time

Swab transport media: 3 days; C and S vial: 7 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Main Campus

Fees & Codes

Fees

- Authorized users can sign in to Test Prices for detailed fee information.
- Clients without access to Test Prices can contact Customer Service 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact Customer Service.

Test Classification

This test was developed using an analyte specific reagent. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

87500

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
VRERP	VRE PCR	62261-3

Result ID	Test Result Name	Result LOINC® Value
SRC60	Specimen source	31208-2
84406	VRE PCR	62261-3