MAYO CLINIC LABORATORIES

Test Definition: VANRA

Vancomycin, Random, Serum

Overview

Useful For

Monitoring adequacy of drug concentration during vancomycin therapy whenever a specimen is submitted or collected without collection timing information

Method Name

Kinetic Interaction of Microparticles in a Solution (KIMS)

NY State Available

Yes

Specimen

Specimen Type

Serum Red

Ordering Guidance

In addition to this random assay, both peak level and trough level testing are available.
1. Serum for a peak level should be drawn 1 hour after completion of dose; order VANPA / Vancomycin, Peak, Serum.
2. Serum for a trough level should be drawn no more than 30 minutes prior to next dose; order VANTA / Vancomycin, Trough, Serum.

Specimen Required

Collection Container/Tube: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.5 mL
Collection Instructions: Centrifuge and aliquot serum within 2 hours of collection.

Forms

If not ordering electronically, complete, print, and send a Therapeutics Test Request (T831) with the specimen.

Specimen Minimum Volume

0.25 mL

Reject Due To

Gross hemolysis	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum Red	Refrigerated (preferred)	14 days	
	Ambient	48 hours	
	Frozen	365 days	

Clinical & Interpretive

Clinical Information

Vancomycin is an antibiotic used to treat infections caused by gram-positive organisms that are resistant to beta-lactam antibiotics, such as methicillin-resistant staphylococci (MRSA), *Streptococcus viridans* group, penicillin/cephalosporin-resistant *Streptococcus pneumoniae*, and penicillin/ampicillin-resistant *Enterococcus* species. The oral formulation, which is not absorbed, is used in the treatment of pseudomembranous colitis caused by *Clostridium difficile*. Vancomycin is also used when patients are intolerant or allergic to beta-lactam antibiotics.

Vancomycin has been associated with nephrotoxicity and ototoxicity, although it appears that many of these reports reflected impurities in early formulations. Monitoring of vancomycin-related nephrotoxicity is recommended only for patients with reduced renal function, those receiving aggressive or prolonged vancomycin regimens, or those at high risk including patients comedicated with other nephrotoxic agents.

Trough concentrations are recommended for therapeutic monitoring of vancomycin, preferably acquired at steady state (just before fourth dose). To avoid development of resistance, vancomycin trough levels should remain above 10.0 mcg/mL. Complicated infections require higher target levels, typically 15.0 to 20.0 mcg/mL. Peak concentrations do not correlate well to efficacy or nephrotoxicity, but may be useful for pharmacokinetic studies or for select patients.

Random levels may be ordered when attempting to determine when to dose vancomycin in patients with renal impairment or those undergoing dialysis.

Reference Values

VANCOMYCIN, TROUGH
Therapeutic: 10.0-20.0 mcg/mL

VANCOMYCIN, PEAK
Therapeutic: 20.0-45.0 mcg/mL

Interpretation

Trough levels correlate better with efficacy than peak levels, with target trough levels of 10.0 and 20.0 mcg/mL, depending on the type of infection.

Peak levels are not recommended for monitoring, except in select circumstances such as when performing pharmacokinetic analyses (eg, area under the curve: AUC determinations). Typical peak levels are between 20.0 and 45.0 mcg/mL.

These levels are consistent with Mayo Clinic Antimicrobial Therapy Guidelines.

Cautions

As with any assay employing mouse antibodies, the possibility exists for interference by human antimouse antibodies (HAMA) in the sample, which could cause falsely lowered results.

Unspecific binding of heterophilic antibodies from the sample to glucose-6-phosphate dehydrogenase of the reagent may lead to falsely lower test results in very rare cases (<10[-6]).

Clinical Reference

1. Rybak M, Lomaestro B, Rotschafer JC, et al: Therapeutic drug monitoring of vancomycin in adult patients: A consensus review of the American Society of Health-System Pharmacists, the Infectious Diseases Society of America, and the Society of Infectious Diseases Pharmacists. Am J Health Syst Pharm. 2009;66:82-98
2. Estes L, Wilson J: Mayo Clinic Antimicrobial Therapy Quick Guide. Mayo Clinic. 2005. Updated July 29, 2020

Performance

Method Description

The assay is based on the kinetic interaction of microparticles in solution (KIMS). Vancomycin antibody is covalently coupled to microparticles and the drug derivative is linked to a macromolecule. The kinetic interaction of microparticles in solutions, photometrically detected by turbidity measurements, is induced by binding of drug-conjugate to the antibody on the microparticles and is inhibited by the presence of vancomycin in the sample. A competitive reaction takes place between the drug conjugate and vancomycin in the serum sample for binding to the vancomycin antibody on the microparticles. The resulting turbidity is indirectly proportional to the amount of drug present in the sample.(Package insert: ONLINE TDM Vancomycin Gen.3. Roche Diagnostics; 04/2024)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

Same day/1 to 2 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.

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Test Classification

This test has been cleared, approved, or is exempt by the US Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

80202

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
VANRA	Vancomycin, Random, S	20578-1

Result ID	Test Result Name	Result LOINC® Value
VANRA	Vancomycin, Random, S	20578-1