Test Definition: TOBRA

Tobramycin, Random, Serum

Overview

Useful For

Monitoring adequacy of serum concentration during tobramycin therapy

This unit code is used whenever a specimen is submitted or collected without collection timing information. The phlebotomist should use this unit code if she or he does not know if this is a peak or trough specimen.

Method Name

Enzyme Immunoassay (EIA)

NY State Available

Yes

Specimen

Specimen Type

Serum

Ordering Guidance

Serum for a peak level should be drawn 30 to 60 minutes after last dose (order TOBPA / Tobramycin, Peak, Serum).

Serum for a trough level should be drawn no more than 30 minutes before next scheduled dose (order TOBTA / Tobramycin, Trough, Serum).

Specimen Required

Preferred: Serum gel
Acceptable: Red top
Specimen Volume: 0.5 mL
Collection Instructions:
1. Serum gel tubes should be centrifuged within 2 hours of collection.
2. Red-top tubes should be centrifuged and aliquoted 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	Reject

hemolysis	

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	7 days	
	Ambient	72 hours	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

Tobramycin is an antibiotic used to treat life-threatening blood infections by gram-negative bacilli, particularly *Citrobacter freundii*, *Enterobacter* (all species), *Escherichia coli*, *Klebsiella pneumoniae*, *Proteus mirabilis*, *Providencia stuartii*, *Pseudomonas aeruginosa*, and *Serratia*. It is often used in combination with beta-lactam therapy.

A tobramycin minimum inhibitory concentration (MIC) of less than 4.0 mcg/mL is considered susceptible for gram-negative bacilli, while a MIC of greater than 8.0 mcg/mL is considered resistant.

Toxicities include ototoxicity and nephrotoxicity. This risk is enhanced in presence of other ototoxic or nephrotoxic drugs. Monitoring of serum levels, renal function, and symptoms consistent with ototoxicity is important. For longer durations of use, audiology and vestibular testing should be considered at baseline and periodically during therapy.

Reference Values

TOBRAMYCIN, PEAK
Therapeutic: 3.0-12.0 mcg/mL
Toxic: >12.0 mcg/mL

TOBRAMYCIN, TROUGH
Therapeutic: <2.0 mcg/mL
Toxic: >2.0 mcg/mL

Interpretation

Target peak concentrations depend on the type of infection being treated. Goal trough levels should be below 2.0 mcg/mL. Concentrations refer to conventional (non-pulse) dosing. Prolonged exposure to either peak levels exceeding 12.0 mcg/mL or trough levels exceeding 2.0 mcg/mL may lead to toxicity.

Cautions

No significant cautionary statements

Clinical Reference

1. Hammett-Stabler CA, Johns T: Laboratory Guidelines for Monitoring of Antimicrobial Drugs. Clin Chem 1998;44(5):1129-1140
2. Moyer TP: Therapeutic drug monitoring. In Tietz Textbook of Clinical Chemistry. Fourth edition. Edited by CA Burtis, ER

Ashwood, Philadelphia, WB Saunders Company, 2006
3. Wilson JW, Estes LL: Mayo Clinic Antimicrobial Therapy Quick Guide. Mayo Clinic Scientific Press and Informa Healthcare USA, 2008

Performance

Method Description

The assay is based on a homogeneous enzyme immunoassay technique used for the quantitative analysis of tobramycin in human serum or plasma. The assay is based on competition between drug in the sample and drug labeled with the enzyme glucose-6-phosphate dehydrogenase (G6PD) for antibody binding sites. Enzyme activity decreases upon binding to the antibody, so the drug concentration in the sample can be measured in terms of enzyme activity. Active enzyme converts oxidized nicotinamide adenine dinucleotide (NAD[+]) to NADH (the reduced form of NAD[+]), resulting in an absorbance change that is measured spectrophotometrically. Endogenous serum G6PD does not interfere because the coenzyme functions only with the bacterial (Leuconostoc mesenteroides) enzyme employed in the assay.(Package insert: ONLINE TDM Tobramycin reagent. Roche Diagnostics; 07/2024)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

Same day/1 to 2 days

Specimen Retention Time

1 week

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 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

80200

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
TOBRA	Tobramycin, Random, S	35670-9

Result ID	Test Result Name	Result LOINC® Value
TOBRA	Tobramycin, Random, S	35670-9