

Overview

Useful For

Monitoring adequate clearance of tobramycin near the end of a dosing cycle

Method Name

Immunoassay

NY State Available

Yes

Specimen

Specimen Type

Serum

Specimen Required

Collection Container/Tube:

Preferred: Serum gel

Acceptable: Red top

Submission Container/Tube: Plastic vial

Specimen Volume: 0.5 mL

Collection Instructions:

1. Draw blood no more than 30 minutes before next scheduled dose.
2. Serum gel tubes should be centrifuged within 2 hours of collection.
3. Red-top tubes should be centrifuged, and the serum aliquoted into a plastic vial 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 | 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* species. 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

Therapeutic: <2.0 mcg/mL

Toxic: >2.0 mcg/mL

Interpretation

Goal levels depend on the type of infection being treated. Goal trough levels should be below 2.0 mcg/mL for conventional (nonpulse) dosing. Prolonged exposure to 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 (G6PDH) 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, resulting in an absorbance change that is measured spectrophotometrically. Endogenous serum G6PDH does not interfere because the coenzyme functions only with the bacterial (*Leuconostoc mesenteroides*) enzyme employed in the assay.( Package insert: Roche Tobramycin reagent, Roche Diagnostic Corp, Indianapolis, IN)

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 |
|---------|-----------------------|--------------------|
| TOBTA   | Tobramycin, Trough, S | 4059-2             |

| Result ID | Test Result Name      | Result LOINC® Value |
|-----------|-----------------------|---------------------|
| TOBTA     | Tobramycin, Trough, S | 4059-2              |