

Overview

Useful For

Monitoring adequacy of drug clearance during gentamicin therapy

Method Name

Turbidimetric 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. Serum gel tubes should be centrifuged within 2 hours of collection.
2. 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 | Ambient | 72 hours | |
| | Refrigerated (preferred) | 7 days | |

| | | | |
|--|--------|---------|--|
| | Frozen | 14 days | |
|--|--------|---------|--|

Clinical & Interpretive

Clinical Information

Gentamicin is an antibiotic used to treat life-threatening blood infections caused by gram-negative bacilli, particularly *Citrobacter freundii*, *Acinetobacter* species, *Enterobacter* 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 gentamicin minimal inhibitory concentration (MIC) of 4.0 mcg/mL or less is considered susceptible for gram-negative bacilli. A MIC of 500 mcg/mL or less is considered synergistic when combined with appropriate antibiotics for treatment of serious enterococcal infections.

Conventional dosing of gentamicin is usually given 2 to 3 times per day by intravenous or intramuscular injections in doses to achieve peak blood concentration between 3.0 to 12.0 mcg/mL depending on the type of infection. Gentamicin also may be administered at higher doses (usually 5-7 mg/kg) once per day to patients with good renal function (known as pulse dosing). Dosing amount or interval must be decreased to accommodate for reduced renal function.

Ototoxicity and nephrotoxicity are the primary toxicities associated with gentamicin. This risk is enhanced in presence of other ototoxic or nephrotoxic drugs. Monitoring of serum levels and symptoms consistent with ototoxicity is important. For longer durations of use, audiology/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 less than 2.0 mcg/mL for conventional dosing. Prolonged exposure to trough levels exceeding 2.0 mcg/mL may lead to toxicity.

Cautions

Patient samples that contain the drug sisomicin will yield falsely elevated values for gentamicin. However, this drug is not usually coadministered with gentamicin.

High concentrations of penicillins or cephalosporins have been shown to inactivate gentamicin in vitro. The degree of inactivation is dependent on the particular aminoglycoside being measured, the type and concentration of the penicillin or cephalosporin that is also present, and the storage conditions of the sample. For patients receiving additional antibiotics of these types, 5 to 7 samples should be assayed immediately or stored frozen.

Interfering heterophile antibodies occur at low frequency in the general population. These antibodies can cause autoagglutination of the microparticle reagent leading to undetected erroneously low results.

Clinical Reference

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1. Wilson JW, Estes LL: Mayo Clinic Antimicrobial Therapy Quick Guide, 2008
 2. Hammett-Stabler CA, Johns T: Laboratory guidelines for monitoring of antimicrobial drugs. Clin Chem 1998 May;44(5):1129-1140
 3. Gonzalez LS III, Spencer JP: Aminoglycosides: a practical review. Am Fam Physician 1998 Nov 15;58(8):1811-1820

Performance

Method Description

The assay is a homogeneous particle-enhanced turbidimetric immunoassay. The assay is based on competition between drug in the sample and drug coated onto a microparticle for antibody binding sites of the gentamicin antibody reagent. The gentamicin-coated microparticle reagent is rapidly agglutinated in the presence of the antigentamicin antibody reagent and in the absence of any competing drug in the sample. The rate of absorbance change is measured photometrically. When a sample containing gentamicin is added, the agglutination reaction is partially inhibited, slowing down the rate of absorbance change. A concentration-dependent classic agglutination inhibition curve can be obtained with maximum rate of agglutination at the lowest gentamicin concentration and the lowest agglutination rate at the highest gentamicin concentration. (Package insert: Roche Gentamicin reagent, Roche Diagnostic Corp, Indianapolis, IN 01/2018)

PDF Report

No

Day(s) Performed

Monday through Sunday

Report Available

Same day/1 day

Specimen Retention Time

1 week

Performing Laboratory Location

Rochester

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

80170

LOINC® Information

| Test ID | Test Order Name | Order LOINC® Value |
|---------|-----------------------|--------------------|
| GENTA | Gentamicin, Trough, S | 3665-7 |

| Result ID | Test Result Name | Result LOINC® Value |
|-----------|-----------------------|---------------------|
| GENTA | Gentamicin, Trough, S | 3665-7 |