MAYO CLINIC LABORATORIES

Test Definition: PAMIK

Amikacin, Peak, Serum

Overview

Useful For
Monitoring adequacy of serum concentration during amikacin therapy

Method Name
Kinetic Interaction of Microparticles in Solution (KIMS)

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	Refrigerated (preferred)	14 days	

	Ambient	72 hours	
	Frozen	28 days	

Clinical & Interpretive

Clinical Information

Amikacin is an aminoglycoside used to treat severe blood infections by susceptible strains of gram-negative bacteria. Aminoglycosides induce bacterial death by irreversibly binding bacterial ribosomes to inhibit protein synthesis. Amikacin is minimally absorbed from the gastrointestinal tract, and thus can been used orally to reduce intestinal flora.

Peak serum concentrations are seen 30 minutes after intravenous infusion, or 60 minutes after intramuscular administration. Serum half-lives in patients with normal renal function are generally 2 to 3 hours. Excretion of aminoglycosides is principally renal, and all aminoglycosides may accumulate in the kidney at 50 to 100 times the serum concentration.

Toxicity can present as dizziness, vertigo, or, if severe, ataxia and a Meniere disease-like syndrome. Auditory toxicity may be manifested by simple tinnitus or any degree of hearing loss, which may be temporary or permanent, and can extend to total irreversible deafness. Nephrotoxicity is most frequently manifested by transient proteinuria or azotemia, which may occasionally be severe. Aminoglycosides also are associated with variable degrees of neuromuscular blockade leading to apnea.

Reference Values

Peak: 20.0-35.0 mcg/mL
Toxic peak: >40.0 mcg/mL

Interpretation

For conventional (nonpulse) dosing protocols, clinical effects may not be achieved if the peak serum concentration is <20.0 mcg/mL. Toxicity may occur if the peak serum concentration is maintained >35.0 mcg/mL for a prolonged period of time.

Cautions

Aminoglycosides are excreted primarily by glomerular filtration, thus, the serum half-life will be prolonged and significant accumulation will occur in patients with impaired renal function.

Clinical Reference

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. national academy of clinical biochemistry. Clin Chem 1998 May;44(5):1129-1140
3. Gonzalez LS III, Spencer JP: Aminoglcosides: a practical review. Am Fam Physician 1998 Nov 15;58(8):1811-1820

Performance

Method Description

Kinetic interaction of microparticles in solution (KIMS) as measured by changes in light transmission.
The assay is a homogeneous immunoassay based on the principle of measuring changes in scattered light or absorbance that result when activated microparticles aggregate in the presence of an amikacin antibody solution. When a sample containing amikacin is introduced, the aggregation reaction is partially inhibited, slowing the rate of the aggregation process. Antibody bound to sample drug is no longer available to promote microparticle aggregation, and subsequent particle lattice formation is inhibited. Thus, a classic inhibition curve with respect to amikacin concentration is obtained, with the maximum rate of aggregation at the lowest amikacin concentration. By monitoring the change in scattered light or absorbance, a concentration-dependent curve is obtained.(Package insert: Amikacin reagent. Roche Diagnostics; 06/2024)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
Same day/1 day

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
80150

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
PAMIK	Amikacin, Peak, S	3319-1

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Test Definition: PAMIK

Amikacin, Peak, Serum

Result ID	Test Result Name	Result LOINC® Value
PAMIK	Amikacin, Peak, S	3319-1