Test Definition: LID

Lidocaine, S

Overview

Useful For

Assessing optimal lidocaine dosing during the acute management of ventricular arrhythmias following myocardial infarction or during cardiac manipulation such as surgery

Assessing potential lidocaine toxicity

Method Name

Enzyme-Multiplied Immunoassay Technique (EMIT)

NY State Available

Yes

Specimen

Specimen Type

Serum Red

Specimen Required

Collection Container/Tube: Red top (serum gel/SST are **not** acceptable)

Submission Container/Tube: Plastic vial

Specimen Volume: 0.5 mL

Collection Instructions: Centrifuge and aliquot serum 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 Red	Refrigerated (preferred)	14 days	
	Ambient	14 days	
	Frozen	14 days	

Clinical and Interpretive

Clinical Information

Lidocaine is commonly used as a local anesthetic, but it is also effective at controlling ventricular arrhythmia and ventricular fibrillation in children and adults. For cardiac therapy, optimal therapeutic response is seen when serum concentrations are between 1.5 and 5.0 mcg/mL. Lidocaine is protein-bound (60-80%), primarily to alpha-1-acid glycoprotein; concentrations of this protein increase after myocardial infarction, which may decrease the amount of free lidocaine and, thus, its efficacy.

Lidocaine undergoes extensive first-pass hepatic metabolism and, therefore, is not administered orally. It is eliminated via renal clearance, with a half-life of approximately 1.5 to 2 hours. Diseases that reduce hepatic or renal function reduce clearance and prolong elimination of lidocaine.

Toxicity occurs when the serum concentration of lidocaine is greater than 6.0 mcg/mL and is usually associated with symptoms of central nervous system excitation, light-headedness, confusion, dizziness, tinnitus, and blurred or double vision. This can be accompanied by bradycardia and hypotension leading to cardiovascular collapse.

Reference Values

Therapeutic: 1.5-5.0 mcg/mL

Critical value: >6.0 mcg/mL

Interpretation

Optimal response to lidocaine occurs when the serum concentration is between 1.5 and 5.0 mcg/mL.

Toxicity is more likely when concentrations exceed 6.0 mcg/mL.

Cautions

No significant cautionary statements

Clinical Reference

1. Milone MC, Shaw LM: Therapeutic drugs and their management. In: Rifai N, Horvath AR, Wittwer CT, eds. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, Elsevier; 2018:800-831

2. Brunton LL, Hilal-Dandan R, Knollmann BC, eds. Goodman and Gilman's: The Pharmacological Basis of Therapeutics. McGraw-Hill; 2018

Performance

Method Description

The enzyme-multiplied immunoassay technique (EMIT) assay is a homogeneous enzyme immunoassay technique used for the analysis of specific compounds in biological fluids. 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, resulting in an absorbance change, which 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: Seimens Lidocaine reagent. Seimens Healthcare Diagnostics, Ltd; 04/2015)

PDF Report

No

Day(s) Performed

Monday through Saturday

Report Available

Same day/1 day

Specimen Retention Time

2 weeks

Performing Laboratory Location

Rochester

Fees and 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 Regional Manager. For assistance, contact Customer Service.

Test Classification

This test has been modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

CPT Code Information

80176

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
LID	Lidocaine, S	3714-3

Result ID	Test Result Name	Result LOINC Value
8382	Lidocaine, S	3714-3