MAYO CLINIC LABORATORIES

Test Definition: MTXSG

Methotrexate Post Glucarpidase, S

Overview

Useful For

Monitoring methotrexate concentrations postglucarpidase therapy

Method Name

Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)

NY State Available

Yes

Specimen

Specimen Type

Serum

Shipping Instructions

Ship specimen in amber vial to protect from light.

Specimen Required

Supplies: Amber Frosted Tube, 5 mL (T192)

Collection Container/Tube:

Preferred: Red top

Acceptable: Serum gel

Submission Container/Tube: Amber vial (T192)

Specimen Volume:1 mL

Forms

If not ordering electronically, complete, print, and send a Therapeutics Test Request (T831) with the specimen.

Specimen Minimum Volume

0.2 mL

Reject Due To

Gross hemolysis	OK
Gross lipemia	OK
Gross icterus	OK
Other	Exposed to light >24 hours

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	7 days	LIGHT PROTECTED
	Frozen	14 days	LIGHT PROTECTED
	Ambient	7 days	LIGHT PROTECTED

Clinical and Interpretive

Clinical Information

Methotrexate, an antimetabolite (folate reductase inhibitor), is used at high dose (12 gm/m[2]) to treat neoplastic diseases, such as lymphocytic leukemia. Therapy is guided by measurement of serum concentration: 24 hours after dosage, the serum concentration should be <10 mcmol/L; 48 hours after therapy, concentration should be <1 mcmol/L; and 72 hours after dosage, the concentration should be <0.1 mcmol/L or <0.05 mcmol/L, depending on clinical protocol. It is also administered at low dose (a single dose of 5-15 mg per week) to treat severe psoriasis and rheumatoid arthritis. Methotrexate is 65% orally bioavailable. Peak serum concentrations are reached 2 to 3 hours after dosing. Protein binding is approximately 45%. Volume of distribution is 0.4 L/kg. Elimination is concentration dependent with an apparent elimination half-life of 1.8 hours when the serum concentration is >1 mcmol/L, 8 hours when between 0.1 and 1 mcmol/L, and approximately 30 hours when <0.1 mcmol/L.

Voraxaze (glucarpidase) is a carboxypeptidase enzyme indicated for the treatment of toxic plasma methotrexate (MTX) concentrations (>1 mcmol/L) in patients with delayed methotrexate clearance due to impaired renal function. Measurement of methotrexate using immunoassays is unreliable for specimens collected within 48 hours following Voraxaze administration since it can result in falsely elevated results. As a result, this liquid chromatography-tandem mass spectrometry assay should be used to monitor MTX concentrations postglucarpidase therapy.

Reference Values

Nontoxic drug concentration after 72 hours: <0.1 mcmol/L

Interpretation

Following a 4 to 6 hour intravenous infusion of methotrexate, postinfusion concentrations greater than the following indicate an increased risk of toxicity if conventional low-dose leucovorin rescue is given:

-24-hour postinfusion concentration: 5.0 to 10.0 mcmol/L

-48-hour postinfusion concentration: 0.5 to 1.0 mcmol/L

-72-hour postinfusion concentration: 0.1 mcmol/L

Cautions

The specimen must be protected from light.

Clinical Reference

Cadman EC, Durivage HJ: Cancer chemotherapy: alkylating agents. In Harrison's Principles of Internal Medicine. 12th edition. Edited by JD Wilson, E Braunwald, KJ Isselbacher, et al. New York, McGraw-Hill Book Company, 1991, pp 1592-1594

Performance

Method Description

Methotrexate is isolated from serum using a methanol crash extraction. Analysis is performed by liquid chromatography-mass spectrometry/mass spectrometry using selected ion monitoring.(Package insert: Voraxaze [Glucarpidase], BTG International Inc, Brentwood, TN, 2012)

PDF Report

No

Day(s) and Time(s) Test Performed

Monday through Sunday; Varies

Analytic Time

Same day/1 day

Maximum Laboratory Time

1 day

Specimen Retention Time

14 days

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 was developed and its performance characteristics 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

80299

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
MTXSG	Methotrexate Post Glucarpidase, S	51602-1

Result ID	Test Result Name	Result LOINC Value
62580	Methotrexate Post Glucarpidase, S	51602-1