Test Definition: MTXSG

Methotrexate Post Glucarpidase, Serum

Overview

Useful For

Monitoring methotrexate concentrations post-glucarpidase therapy

Documenting failure to respond that may be due to noncompliance

Guiding dosage adjustments in patients with kidney failure

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 (T915)
Collection Container/Tube:
Preferred: Red top
Acceptable: Serum gel
Submission Container/Tube: Amber vial
Specimen Volume: 1 mL
Collection Instructions: Within 2 hours of collection, centrifuge and aliquot serum into an amber vial.

Forms

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

Specimen Minimum Volume

0.5 mL

Reject Due To

Gross hemolysis	OK

Gross lipemia	OK
Gross icterus	OK
Exposed to light >24 hours	Reject

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Methotrexate (MTX) is a folate antimetabolite that reversibly inhibits dihydrofolate reductase. MTX is used alone or in combination with other agents to treat a variety of cancers (ie, breast, leukemia, lymphoma, head and neck, lung, and sarcomas). Administration of intravenous high-dose MTX (ie, 1-15 g/m2) occurs at different intervals in treatments and depends on the regimen being used. Therapy is guided by measurement of serum concentration: 24 hours after dosage, the serum concentration should be less than 10 mcmol/L; 48 hours after therapy, concentration should be less than 1 mcmol/L; and 72 hours after dosage, the concentration should be less than 0.1 mcmol/L or less than 0.05 mcmol/L, depending on clinical protocol. MTX can also be used at lower doses (ie, a single dose of 5-15 mg/wk) to treat patients with rheumatoid arthritis and severe psoriasis. In adults, oral absorption appears to be dose dependent. Peak serum concentrations are reached within 1 to 3 hours after oral dosing and 0.5 to 1 hour after intramuscular injection. Protein binding is approximately 50%. Volume of distribution is 0.4 to 0.8 L/kg. Elimination is concentration dependent with an apparent elimination half-life of 3 to 10 hours for patients on low dose therapy (<30 mg/m2) compared to 8 to 15 hours for patients on high doses of MTX.

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

1. Cadman EC, Durivage HJ. Cancer chemotherapy: alkylating agents. In: Wilson JD, Braunwald E, Isselbacher KJ, eds. Harrison's Principles of Internal Medicine. 12th ed. McGraw-Hill Book Company; 1991:1592-1594

2. Jameson JL, Fauci AS, Kasper DL, Hauser SL, Longo DL, Loscalzo J, eds. Harrison's Principles of Internal Medicine. 20th ed. McGraw-Hill Education; 2018
3. Rifai N, Horvath AR, Wittwer CT. Tietz Textbook of Clinical Chemistry and Molecular Diagnostics. 6th ed. Elsevier; 2017
4. Voraxaze (Gl ucarpidase). Package insert. BTG International Inc; 2012

Performance

Method Description
The serum sample is diluted in a methanol containing internal standard. The protein precipitate is mixed and centrifuged, and a portion of the supernatant is diluted with mobile phase for detection by tandem mass spectrometry.(Unpublished Mayo method)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
Same day/1 day

Specimen Retention Time
14 days

Performing Laboratory Location
Mayo Clinic Laboratories - Rochester Superior Drive

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 was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information
80204

LOINC® Information

Test Definition: MTXSG

Methotrexate Post Glucarpidase, Serum

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