

Methotrexate

Synonyms

MTX

Clinical Indication

Methotrexate is used to treat acute lymphoblastic leukemia and a number of other haematologic malignancies as well as rheumatoid arthritis and psoriasis. Methotrexate prevents cells from using folate by inhibiting the enzyme dihydrofolate reductase which is essential for the synthesis of DNA and RNA, slowing the growth of new cancer cells. Because it can also deter the growth of new skin cells, methotrexate is also used to treat psoriasis.

Available only for monitoring patients after administration of high dose methotrexate. The test is typically ordered at regular intervals (e.g. 24hrs, 48hrs, 72hrs as needed) after administration of high dose methotrexate. It is not available for monitoring patients on low dose methotrexate therapy.

Leucovorin/Folinic acid can be given as a rescue treatment to protect from the toxic effects of methotrexate and analysis of MTX levels identifies the requirement for leucovorin and guides the timing and dose of administration. The main toxicities of HDMTX are elevated serum transaminases and renal insufficiency, which can delay drug clearance. Leucovorin can only rescue normal cells that have not already had lethal DNA damage from the toxic effects of MTX. Thus to be effective, treatment with leucovorin must be initiated within 24 to 36 hours of starting high dose MTX.

Part of Profile / See Also

Request Form

Combined Pathology manual Blood form or ICE request

Availability / Frequency of Analysis

Referred Test: Analysed by Biochemistry, University College London Hospital [8097](#) if clinically indicated.

Turnaround Time

Same day turnaround if the laboratory is contacted in advance of samples being sent.

Patient Preparation

Please ensure the time the high dose MTX was given is clearly stated on the request form.

Sample Requirements

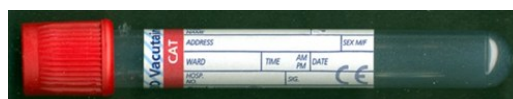
Specimen Type

Serum (plain)

Volume

2ml

Container



Red top (plain) tube is preferred



Paediatric lithium heparin (Orange top – Sarstedt tube)



Paediatric lithium heparin (Pale green top – BD

Microtainer)

Reference Range & Units

< 0.10 umol/L after 48 hours

Interferences

Interpretation & Clinical

Decision Value (if applicable)

Studies show that the risk of MTX-associated toxicity is minimal in the absence of elevated MTX concentrations, and that in most circumstances, the development of MTX-associated toxicities can be ameliorated or prevented when patients receive pharmacokinetically guided doses of leucovorin rescue.

<https://bnf.nice.org.uk/drug/methotrexate.html>

References

Up to Date – Therapeutic Use and Toxicity of High-Dose Methotrexate –

Searched November 2018.

Test code

METR

Lab Handling

Aliquot 500ul and store in referrals rack at 4C. Sent daily by courier to UCLH.

Ensure any MTX requests are discussed with the Duty Biochemist to assess the urgency with which the result is required. An additional courier run may need to be scheduled to transport the sample to UCLH.



8097
Accredited to
ISO 15189:2012