

Division of Laboratory Medicine

Biochemistry

Lithium (serum)

Lithium is used in the prophylaxis and treatment of a variety of psychiatric disorders including depression and mania. The complete actions of Lithium are not fully understood but it is thought that mood stabilisation is brought about by modulation of the neurotransmitters dopamine, NMDA, glutamate and GABA.

Lithium has a narrow therapeutic range where toxicity can cause tremor, renal impairment and convulsions. Early symptoms include apathy, sluggishness, drowsiness, lethargy, speech difficulties, irregular tremors, myoclonic twitching, muscle weakness and ataxia. Peak serum levels occur 2 to 4 hours after an oral dose. The half-life in serum is 48 to 72 hours and it is cleared through the kidneys (excretion parallels that of sodium). Reduced renal function can prolong clearance time and for this reason, creatinine is measured on all Lithium requests. Serum lithium concentrations are measured essentially to ensure compliance and to avoid toxicity.

Long term use of lithium has been associated with thyroid disorders and mild cognitive and memory impairment. Quantification is therefore important for therapeutic drug monitoring and patient management.

General information

Collection container: Serum (Sarstedt Brown top, 4.9ml)



Type and volume of sample: Serum 1.0ml (150µl separated serum required)

Specimen transport/special precautions

For non-A&E URGENT requests (suspected toxicity only) telephone the laboratory to notify them.

Samples should be taken 12 hours post dose. If the last dose is unknown (acute admission) please state this on the request.

In suspected acute toxicity, take a sample immediately and then again at 6 hours.

Laboratory information

Method principle: Colourimetric analysis on Roche equipment

Lithium present in the sample reacts with a substituted porphyrin compound at an alkaline pH, resulting in a change in absorbance which is directly proportional to the concentration of lithium in the sample.

Measured at all MFT biochemistry sites.

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Biological reference range: 0.4-1.0 mmol/L

Turnaround times:

Urgent - 2 hours from receipt

Routine - Next working day

Clinical Information

Clinical Decision Points: Results ≥ 1.5 mmol/l are telephoned

(Last updated December 2021)