

Consider chronic lithium poisoning in patients treated therapeutically with lithium who present with neurological symptoms or signs

See 'Lithium (Li)- Acute Ingestion' guideline if the patient is taking lithium therapeutically + presents after an acute ingestion

## Toxicity / Risk Assessment

Neurotoxicity is the predominant feature: degree of CNS toxicity correlates approximately with lithium concentration

### Increased risk of lithium related neurotoxicity with:

- Increasing doses of lithium
- Acute / chronic renal impairment
- Significant fluid or Na<sup>+</sup> depletion
- Drugs causing ↓GFR: ACE inhibitors, A2RB, NSAIDs, diuretics
- Elderly, nephrogenic diabetic insipidus (NDI), thyroid dysfunction, hyperparathyroidism (↑Ca<sup>2+</sup>)

### Clinical features: (insidious onset)

**Mild:** tremor (can be present at therapeutic Li concentration), nausea, diarrhoea, hyperreflexia

**Moderate:** drowsy, confusion, ataxia, increased muscle tone

**Severe:** coma, seizures, ↓BP, bradycardia, ↑QT, myoclonus

**Metabolic:** ↑/↓Na<sup>+</sup>, ↑Ca<sup>2+</sup>, nephrogenic DI

**Endocrine:** NDI, thyroid dysfunction

**Long-term complications:** Cerebellar / cognitive impairment

**Management** Treat any underlying cause possibly contributing to accumulation (e.g. sepsis/renal failure), consider strict fluid/electrolyte management and enhanced lithium elimination

- Replace fluid loss with crystalloid (Consider normal saline if hyponatremic)
- Cease lithium and any nephrotoxic medications (ACEIs, A2RB, NSAIDs, diuretics)
- Optimize renal function, aim for urine output 1-2 mL/kg/hour
- Monitor electrolytes and fluid status (strict input and output). Large outputs are suspicious for NDI
- Monitor lithium concentrations 6 to 8 hourly. Check thyroid function.

### Indications for extracorporeal elimination:

- Haemodialysis should be considered (discuss with toxicologist) for any case with moderate-severe clinical features **regardless** of Li concentration OR any patient with a lithium concentration > 4.0 mmol/L
- Factors that should be considered and may lower threshold for haemodialysis:
  - Co-existing renal impairment
  - Raised lithium concentration and confusion with no other cause
  - Co-existing dehydration, significant electrolyte abnormalities

- **Endpoint:** lithium concentration < 1.0 mmol/L and clinical evidence of improvement

- Toxicity may take days/weeks to improve even after lithium concentration has become <1mmol/L

### Disposition

- All patients with chronic toxicity are likely to require inpatient management for >24 hours
- Patients with severe neurological features require admission to an HDU/ICU with access to extracorporeal elimination