

**BLOOD SCIENCES
DEPARTMENT OF CLINICAL BIOCHEMISTRY**Title of Document: *Lithium Monitoring: Statement of Good Practice*Q Pulse Reference N^o: BS/CB/DCB/PROTOCOLS/22

Authoriser: P Beresford

Version N^o: 5

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Lithium Monitoring: Statement Of Good Practice**1) Introduction****1.1 Scope and purpose**

The purpose of this protocol is to provide information relating to the therapeutic monitoring of Lithium therapy.

1.2 Responsibility for document

This document is to be reviewed on a 2 yearly basis by the author of the protocol or nominated clinical biochemist.

1.3 Location of Copies

- 1) Duty Biochemist File
- 2) Severn Pathology website

1.4 References

1. British National Formulary, accessed on 02/07/2018 via:
<https://bnf.nice.org.uk/drug/lithium-citrate.html>
2. NICE clinical guideline 185, September 2014 updated April 2018. Bipolar disorder; The assessment and management of bipolar disorder in adults, children and young people, in primary and secondary care.
<https://www.nice.org.uk/guidance/cg185>
3. Patient Safety Alert: Safer lithium therapy. NPSA/2009/PSA005 December 2009,
<https://www.sps.nhs.uk/articles/npsa-alert-safer-lithium-therapy-2009/>

1.4 Definitions

None required

1.5 Related documents

Guidelines for Therapeutic Drug Monitoring BS/CB/DCB/TOX/3

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- 1 Patients prescribed lithium should be monitored in accordance with NICE guidance.
- 2 For each patient the responsibility for lithium monitoring must be agreed, communicated and clearly documented. All patients are started on lithium by a psychiatrist and it is their responsibility to establish a shared care arrangement with the patient's GP for prescribing lithium and monitoring adverse effects. Such shared care arrangements should be agreed in writing and a copy held by the psychiatrist and the GP.
- 3 A lithium treatment pack should be given to patients on initiation of treatment with lithium. The pack consists of a patient information booklet, lithium alert card and a record book for recording serum lithium concentrations. The Patient Safety Alert, supporting documentation and PDFs of a Lithium Therapy Record book, Lithium Therapy – Important information for patients booklet and Lithium Alert Card can be accessed and downloaded from the NPSA website at <http://www.npsa.nhs.uk>. Supplies of the patient information booklet, lithium alert card and record book are available from the current NHS Non-Secure Contract held by 3M. Orders should be sent to:

Telephone 0845 610 1112 Email: nhsforms@spsl.uk.com

The pack should be given to the patient by the psychiatrist initiating the treatment and a record of its issue made in the patient's notes.
- 4 When starting lithium, the patient should be advised that poor adherence or rapid discontinuation may increase the risk of relapse. They should also be educated about possible side effects (e.g. tremor, ataxia, nausea, nystagmus, diarrhoea, polyuria, polydipsia, etc.) and advised to seek immediate medical attention if they occur. The counselling may be reinforced at the time of issuing repeat prescriptions.
- 5 The patient's weight or BMI should be recorded and urea and electrolytes, including calcium, estimated GFR (eGFR), thyroid function and full blood count should be requested. Lithium therapy is contraindicated in untreated hypothyroidism and Addison's disease, and greater caution (with more intensive monitoring) is needed in patients with renal and cardiovascular disease. Concurrent use of diuretics (particularly thiazides) should be avoided as sodium depletion can worsen features of lithium toxicity.
- 6 An ECG should be arranged for people with cardiovascular disease or risk factors for it.
- 7 Measure serum lithium levels 1 week after starting lithium and 1 week after every dose change, and weekly until the levels are stable. The blood sample for lithium measurement should be taken twelve hours after the preceding dose, preferably at the same time for each patient. The time of the blood sample and the time of the last dose must be recorded on the request form.

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- 8 Serum lithium should be measured every 3 months for the first year of therapy. After the first year, measure serum lithium every 6 months, or every 3 months for people in any of the following groups:
- Older people
 - People taking drugs that interact with lithium
 - People who are at risk of impaired renal or thyroid function, raised calcium levels or other complications
 - People who have poor symptom control
 - People with poor adherence
 - People whose last lithium level was 0.8 mmol/L or higher
- 9 Additional serum lithium measurements should be made if a patient develops significant intercurrent illness or if there is a significant change in the patient's sodium or fluid intake.
- 10 The NICE clinical guideline for long-term management of bipolar disorder (Ref 2) quotes the following therapeutic ranges:
Aim for:
0.6-0.8 mmol/L normally, or
0.8-1.0 mmol/L if the patient has relapsed previously on lithium or has sub-threshold symptoms with functional impairment.
- 11 The BNF (Ref 1); recommends the following therapeutic ranges: 0.4-1.0 mmol/L at 12 hours post dose (lower end of the range for maintenance therapy and elderly patients). A target serum lithium concentration of 0.8 – 1.0 mmol/L is recommended for acute episodes of mania and for patients who have previously relapsed or have sub-syndromal symptoms.
- 12 In patients receiving lithium, calcium, thyroid function and renal function (including eGFR) should be assessed every 6 months, more often if there is evidence of impaired renal or thyroid function, raised calcium or an increase in mood symptoms that might be related to impaired thyroid function. The patient's weight or BMI should also be recorded every 6 months.
- 13 Monitor lithium dose and serum lithium levels more closely if urea and creatinine levels become elevated, or eGFR falls over 2 or more tests, and assess the rate of deterioration of renal function. For further information, see NICE's guidance on chronic kidney disease and acute kidney injury. Other risk factors, warranting more regular testing, may include starting ACE inhibitors, NSAIDS or diuretics.
- 14 Advise patients taking lithium to:
- Seek medical attention if they develop diarrhoea or vomiting or become acutely ill for any reason
 - Ensure they maintain their fluid intake, particularly after sweating (for example, after exercise, in hot climates or if they have a fever), if they are immobile for long periods or if they develop a chest infection or pneumonia.
 - Talk to their doctor as soon as possible if they become pregnant or are planning a pregnancy

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- Not take over the counter NSAIDs and avoid prescribing these drugs for people with bipolar disorder if possible. If they are prescribed, this should be on a regular (not prn) basis and the person should be monitored monthly until a stable lithium level is reached and then every 3 months.
- 15 Overdosage, usually with serum lithium concentration >1.5 mmol/L, may be fatal and toxic effects include tremor, ataxia, dysarthria, nystagmus, renal impairment, and convulsions. If these potentially hazardous signs occur, treatment should be stopped, serum lithium re-measured, and steps taken to reverse lithium toxicity.
- 16 In mild cases, withdraw lithium and ensure adequate hydration and correction of electrolyte imbalance. Use of IV sodium chloride (0.9%) should be considered to maintain urine output.
- 17 Serum lithium concentration >2.0 mmol/L requires urgent treatment. Haemodialysis may be necessary. Advice may be sought from National Poisons Information Service (www.toxbase.org) Tel: 0844 8920111
- 18 The patient should be monitored at every appointment for symptoms of neurotoxicity including paraesthesia, ataxia, tremor and cognitive impairment which can occur at therapeutic levels of lithium.
- 19 There must be reliable systems in place to ensure blood test results are communicated between laboratories and prescribers. Patients' blood samples need to be taken in advance of clinical assessment.
- 20 Laboratory turnaround times should be known and audited.
- 21 Many medications have been reported as interacting with lithium. The following are particularly of mention:
- a) Thiazides and related diuretics
 - b) Non-steroidal anti-inflammatory drugs (NSAIDs)
 - c) Sodium bicarbonate containing non-prescription antacids or urinary alkalisating agents.
- Further information on drug interactions can be found at:
https://www.medicinescomplete.com/#/content/bnf/480859452_interactions
- 22 Long term use of lithium has been associated with thyroid disorders and mild cognitive and memory impairment. Lithium treatment increases the risk of clinical hypothyroidism up to five-fold, the risk being particularly high in women aged 40-59 years. The need for continued therapy should be assessed regularly and patients should be maintained on lithium after 3-5 years only if benefit persists.
- 23 If stopping lithium, reduce the dose gradually over at least 4 weeks, and preferably up to 3 months, even if the person has started another antimanic drug. During dose reduction and for 3 months after lithium is stopped, the patient should be monitored closely for early signs of mania and depression