lithium (lith-ee-um)

- Carbolith, Lithane, Lithmax, Lithobid

**Classification**
- Therapeutic: mood stabilizers

**Pregnancy Category D**

**Indications**
- Manic episodes of bipolar I disorder (treatment, maintenance, prophylaxis).

**Action**
- Alters cation transport in nerve and muscle. May also influence reuptake of neurotransmitters.

**Therapeutic Effects:**
- Prevents/decreases incidence of acute manic episodes.

**Pharmacokinetics**
- **Absorption:** Completely absorbed after oral administration.
- **Distribution:** Widely distributed into many tissues and fluids; CSF levels are 50% of plasma levels. Crosses the placenta; enters breast milk.
- **Metabolism and Excretion:** Excreted almost entirely unchanged by the kidneys.
- **Half-life:** 20–27 hr.

**TIME/ACTION PROFILE (antimanic effects)**

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<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
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<tbody>
<tr>
<td>PO, PO–ER</td>
<td>5–7 days</td>
<td>10–21 days</td>
<td>days</td>
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**Contraindications/Precautions**
- **Contraindicated in:** Hypersensitivity; Severe cardiovascular or renal disease; Dehydrated or debilitated patients; Brugada syndrome; Should be used only where therapy, including blood levels, may be closely monitored; Some products contain alcohol or tartrazine and should be avoided in patients with known hypersensitivity or intolerance.

**Lactation:** Lactation.

**Use Cautiously in:**
- Any degree of cardiac, renal, or thyroid disease;
- Diabetes mellitus.

**OB:**
- Fetal cardiac anomalies are associated with lithium use; however, potential maternal benefits may warrant use in some pregnant women. Great initial dosage is recommended.

**Adverse Reactions/Side Effects**
- **CNS:** SEIZURES, fatigue, headache, impaired memory, ataxia, sedation, confusion, dizziness, drowsiness, paresthesia, tremors, stupor, ENEE, aphasia, tremors; headache, dizziness, nausea, dry mouth, metallic taste.
- **EENT:** Aphasias, blurred vision, dysarthria, tinnitus.
- **CV:** ECG changes, arrhythmias, edema, hypotension, unmasking of Brugada syndrome.
- **GI:** Abdominal pain, anorexia, bloating, diarrhea, constipation, flatulence, rectal bleeding, dry mouth, metallic taste.
- **GU:** Polyuria, glycosuria, nephrogenic diabetes insipidus, renal toxicity.
- **Derm:** Acneiform eruption, folliculitis, alopecia, diminished sensation, pruritus.
- **Endo:** Hypothyroidism, goiter, hyperglycemia, hypothyroidism.
- **F and E:** Hyponatremia.
- **Hemat:** Leukocytosis.
- **Metab:** Weight gain.
- **MS:** Muscle weakness, hyperirritability, rigidity.
- **Neuro:** Tremors.

**Interactions**
- **Drug-Drug:** May prolong the action of neuromuscular blocking agents; risk of neurologic toxicity with haloperidol. Diuretics, methyldopa, probenecid, fluoxetine, and NSAIDs may increase risk of toxicity. Blood levels may be monitored for signs of lithium toxicity. Hypothyroidism may be additive with potassium iodide or antithyroid agents. Aminophylline, phenothiazines, and drugs containing large amounts of sodium may result in dehydration and accumulation of lithium and/or lithium levels.

**Drug-Natural Products:** Caffeine-containing herbs (cola nut, guarana, mate, tea, coffee) may alter serum levels and efficacy.

**Drug-Food:** Large changes in sodium intake may alter the renal elimination of lithium.

**Route/Dosage**
- Precise dosing is based on serum lithium levels. 300 mg lithium carbonate contains 8–12 mEq lithium.

**PO (Adults and children ≥12 yr):**
- Tablets/capsules — 300–600 mg 3 times daily initially; usual maintenance dose is 300 mg 3–4 times daily.
- Extended-release tablets — 450–900 mg twice daily or 300–600 mg 3 times daily initially; usual maintenance dose is 450 mg twice daily or 300 mg 3 times daily.

**PO (Children <12 yr):**
- 15–20 mg (0.4–0.5 mEq)/kg/day in 2–3 divided doses; dosage may be adjustedweekly.
NURSING IMPLICATIONS

Assessment

- Assess mental status (orientation, mood, behavior) initially and periodically. Institute suicide precautions if indicated.
- Monitor intake and output ratios. Report significant changes in totals. Unless contraindicated, fluid intake of at least 2000–3000 mL/day should be maintained.
- Weight should also be monitored at least every 3 mo.

- Lab Test Considerations: Evaluate renal and thyroid function, WBC with differential, serum electrolytes, and glucose periodically during therapy.

- Toxicity and Overdose:
  - Monitor serum lithium levels twice weekly during initiation of therapy and every 2 mo during chronic therapy. Draw blood samples in the morning immediately before next dose. Therapeutic levels range from 0.5 to 1.5 mEq/L for acute mania and 0.6–1.2 mEq/L for long-term control. Serum concentrations should not exceed 2.0 mEq/L.
  - Assess patient for signs and symptoms of lithium toxicity (vomiting, diarrhea, slurred speech, decreased coordination, drowsiness, muscle weakness, or twitching). If these occur, report before administering next dose.

Potential Nursing Diagnoses

- Disturbed thought process (Indications)
- Ineffective coping (Indications)
- Imbalanced nutrition: risk for more than body requirements (Side Effects)

Implementation

- Do not confuse lithium carbonate with lanthanum carbonate.
- PO: Administer with food or milk to minimize GI irritation. Extended-release preparations should be swallowed whole; do not break, crush, or chew.

Patient/Family Teaching

- Instruct patient to take medication as directed, even if feeling well. Take missed doses as soon as remembered unless within 2 hr of next dose (6 hr if extended release).
- Lithium may cause dizziness or drowsiness. Caution patient to avoid driving or other activities requiring alertness until response to medication is known.
- Low sodium levels may precipitate patient to toxicity. Advise patient to drink 2000–3000 mL/d daily and eat a diet with consistent and moderate sodium intake. Excessive amounts of coffee, tea, and cola should be avoided because of diuretic effect. Avoid activities that cause excess sodium loss (heavy exertion, exercising in hot weather, sodium-free diet). Notify health care professional of liver, vomiting, and diarrhea, which also cause sodium loss.
- Advise patient that weight gain may occur. Review principles of low-calorie diet.
- Advise patient to notify health care professional of all Rx or OTC medications, vitamins, or herbal products being taken and to consult with health care professional before taking other medications, especially NSAIDs.
- Review side effects and symptoms of toxicity with patient; instruct patient to stop medication and report signs of toxicity to health care professional promptly.
- Advise patient to notify health care professional of fainting, irregular pulse, or difficulty breathing occurs.
- Advise patient to use contraception and to consult health care professional if pregnancy is suspected or if breast feeding.
- Emphasize the importance of periodic lab tests to monitor for lithium toxicity.

Evaluation/Desired Outcomes

- Resolution of the symptoms of mania (hyperactivity, pressured speech, poor judgment, need for little sleep).
- Decreased incidence of mood swings in bipolar disorders.
- Improved affect in unipolar disorders. Improvement in condition may require 1–3 wk.
- Decreased incidence of acute manic episodes.

Why was this drug prescribed for your patient?