⚕ PSYCHOPHARMACOLOGY · MOOD STABILIZERS · NCLEX 2026

Lithium

First-line mood stabilizer for bipolar disorder — narrow therapeutic index, high-yield NCLEX content. The gold standard. The one with the fence.

Class: Mood Stabilizer / Antimanic

Brand: Lithobid · Eskalith

Therapeutic: 0.6–1.2 mEq/L

Toxic: > 1.5 mEq/L

1 Definition & Overview

What it is · why it matters

- **Lithium carbonate** is a naturally occurring salt and the **first-line treatment for acute mania and long-term maintenance of bipolar disorder.** It is the only mood stabilizer proven to reduce suicide risk in bipolar patients.
- Has a **narrow therapeutic index** — the difference between a therapeutic and toxic dose is small. `Therapeutic 0.6–1.2 mEq/L`; `toxicity > 1.5 mEq/L`.
- **Slow onset** — antimanic effects in 5–7 days, full mood stabilization takes **2–3 weeks**. A short-acting antipsychotic (e.g., olanzapine) or benzodiazepine often bridges the gap during acute mania.
- Lithium is **excreted unchanged by the kidneys** and competes with sodium for reabsorption — this is why **sodium and fluid balance matter so much**.

2 Pathophysiology & Mechanism

Step-by-step · simplified

1 In bipolar disorder, **neurotransmitter signaling is dysregulated** — excessive norepinephrine, dopamine, and glutamate drive manic episodes; deficient serotonin drives depressive episodes.

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2 Lithium enters neurons via **sodium channels** and substitutes for Na^+, **altering ion flux and dampening neuronal excitability.**

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3 It **inhibits the second-messenger systems** (inositol monophosphatase, GSK-3) that amplify catecholamine signaling — reducing dopamine and norepinephrine transmission.

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4 Simultaneously **increases serotonin synthesis and release** — stabilizing mood from the depressive side.

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5 **Net effect:** reduced manic excitability, elevated mood floor, and neuroprotective effects (GSK-3 inhibition increases BDNF). Mood is "stabilized" between the poles.

3 Signs & Symptoms of Toxicity ⚠️

Early/mild vs late/severe — level-dependent

🟠 EARLY / MILD TOXICITY · 1.5 - 2.0 MEQ/L

- 🤢 **GI symptoms first** — nausea, vomiting, diarrhea, abdominal pain
- 🖐️ **Fine hand tremor** worsening into **coarse tremor**
- 😵 Mild confusion, drowsiness, lethargy
- 💪 Muscle weakness, lack of coordination
- 👅 Slurred speech, dry mouth, metallic taste
- 🚽 Polyuria, polydipsia (often **baseline** side effects)

🔴 LATE / SEVERE TOXICITY · > 2.0 MEQ/L

- 🚶 **Ataxia** — wide-based unsteady gait
- 👁️ **Nystagmus**, blurred vision
- ⚡ **Hyperreflexia, myoclonus, seizures**
- 💓 Cardiac dysrhythmias, hypotension, bradycardia
- 🌀 Severe confusion, disorientation, psychosis
- ⚰️ **Coma, cardiovascular collapse, death** at > 3.0 mEq/L

🚨 **RED FLAG — HOLD THE DOSE**

If the patient develops **persistent vomiting/diarrhea, coarse tremor, ataxia, confusion, or slurred speech — HOLD the next dose, notify the provider, and draw a STAT lithium level.** These mean toxicity until proven otherwise. Mild fine tremor and polyuria are expected and **not** reasons to hold.

4 Priority Nursing Interventions

ABCs · Safety · Maslow · NCLEX prioritization

#1 PRIORITY: Monitor **serum lithium levels** + assess for signs of toxicity every shift. ABCs first if toxic — airway, then seizure precautions, then call provider.

Monitor Drug Levels

Draw trough levels **12 hours after the last dose**. Check **twice weekly on initiation**, then every 2–3 months once stable. Therapeutic: **0.6–1.2 mEq/L**.

Ensure Hydration

Encourage 2–3 L of fluid/day and a **consistent sodium intake**. Dehydration and Na^+ loss → lithium retention → toxicity.

Baseline & Ongoing Labs

Before starting: **BUN/creatinine, eGFR, TSH, electrolytes, ECG, pregnancy test**. Recheck renal & thyroid **every 6 months**.

Safety / Seizure Precautions

During acute mania or toxicity: **seizure precautions, fall risk, padded side rails, suicide assessment**. Quiet, low-stimulation environment.

Administer Properly

Give **with food or milk** to reduce GI upset. Do **not** crush extended-release. Same time daily for stable levels.

Bridge Therapy

Onset is 5–7 days. Expect **short-term antipsychotic or benzodiazepine** for acute mania until lithium is therapeutic.

If Toxicity Suspected

HOLD dose → STAT level → notify provider. Severe: prepare for **IV fluids (NS) and possible**

Pregnancy Screening

Lithium is **teratogenic — Ebstein's anomaly** (cardiac defect). Screen before initiation

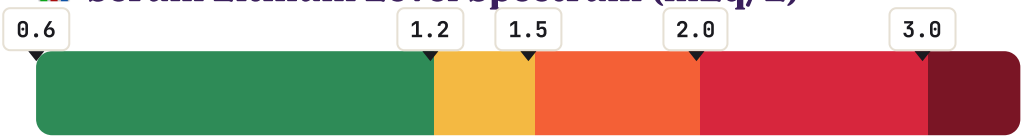
hemodialysis (level > 2.5 or symptomatic).

and **educate on reliable contraception**.

5 Pharmacology Deep Dive

Levels · interactions · monitoring

Serum Lithium Level Spectrum (mEq/L)



0.6 – 1.2	1.2 – 1.5	1.5 – 2.0	> 2.0
Therapeutic / Maintenance ✅	Acute mania range / caution ⚠️	Early toxicity 🟠	Severe → lethal 🔴

Lithium Carbonate

Mood Stabilizer · Antimanic

MECHANISM

Substitutes for Na^+ in neurons; inhibits inositol & GSK-3 second messengers; ↓ dopamine & norepinephrine, ↑ serotonin.

ONSET / HALF-LIFE

Onset **5–7 days**; full effect **2–3 weeks**. Half-life **~24 h** (longer with age & renal impairment).

EXCRETION

100% renal, unchanged. Reabsorbed in the proximal tubule in **competition with Na^+**. Low Na^+ → Li^+ retention.

COMMON SIDE EFFECTS

Fine hand tremor, polyuria, polydipsia, weight gain, GI upset, metallic taste, acne, hypothyroidism, nephrogenic DI.

CONTRAINDICATIONS

Severe renal/cardiac disease, severe dehydration, hyponatremia, first trimester pregnancy (relative), breastfeeding.

ANTIDOTE / REVERSAL

No specific antidote. Treatment: **IV normal saline** for hydration; **hemodialysis** for severe toxicity (> 2.5 or symptomatic).

⬆️ ↑ Lithium Levels (Toxicity Risk)

- **NSAIDs** (ibuprofen, naproxen)
- **Thiazide diuretics** (HCTZ)
- **ACE inhibitors** (lisinopril) / ARBs

⬇️ ↓ Lithium Levels (Subtherapeutic)

- **Caffeine** (↑ renal excretion)
- **Theophylline**
- **High sodium intake**

- **Low-sodium diet**, dehydration
- Excessive sweating, fever, vomiting

- **Osmotic diuretics** (mannitol)
- Pregnancy (↑ GFR)

6 NCLEX Test Traps

What students confuse · priority vs distractor

Fine tremor VS Coarse tremor

Fine hand tremor = expected side effect; manage with propranolol if bothersome. **Coarse tremor = TOXICITY**; hold the dose. Don't pick "reassure the patient" if the tremor is coarse.

"Low-sodium diet" is the wrong answer

If a stem says the patient started a **low-sodium diet** or began **HCTZ** → that's the cause of toxicity. Lithium needs a **consistent, normal sodium intake** — not low, not high. Test-takers wrongly assume low-Na is "healthy."

"It's not working" trap

Lithium takes **1–3 weeks** for full effect. If the patient is still manic on day 3, do **NOT** increase the dose without a level. Expect a bridging antipsychotic/benzodiazepine. Don't pick "ask provider to increase the dose."

Polyuria VS Diabetes

Lithium-induced polyuria = **nephrogenic diabetes insipidus** (vasopressin-resistant), **NOT** type 2 diabetes. The answer is "encourage fluids," not "check blood sugar."

NSAIDs for headache → toxicity

If a patient on lithium says "I've been taking **ibuprofen** for headaches" → that's the cause of rising levels. The teaching is to use **acetaminophen** instead. NSAIDs reduce renal lithium excretion.

When to draw a level

Trough levels are drawn **12 hours after the last dose** — typically the morning dose held until the level is drawn. Levels drawn at any

other time are unreliable. Pick "draw level before AM dose."

Pregnancy / breastfeeding

Ebstein's anomaly = lithium teratogenicity (cardiac). If the patient is pregnant or planning pregnancy, lithium is generally **contraindicated in the first trimester**. Lithium is also excreted in breast milk — **don't breastfeed**.

7 Patient & Family Education

Empowering self-management & safety

💧

Drink Consistently

Drink **2–3 liters of water/day** and **maintain a steady salt intake**. Do not start a low-sodium diet without telling your provider.

🤒

Sick Day Rules

If you have **fever, vomiting, diarrhea, or heavy sweating** — stop the dose and call your provider. Dehydration causes toxicity.

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Avoid NSAIDs

Do **not** use ibuprofen, naproxen, or aspirin for pain. Use **acetaminophen (Tylenol)**. Always tell pharmacists you're on lithium.

⏰

Take Consistently

Take **at the same time daily, with food**. Don't double up if you miss a dose; skip and resume.

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Keep Lab Appointments

Routine **lithium levels, kidney & thyroid checks** are non-negotiable. Don't skip them — they keep you safe.

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Know the Warning Signs

Call provider immediately if you have **vomiting, diarrhea, coarse hand shaking, unsteady walking, slurred speech, or confusion.**

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Heat & Exercise

Heavy sweating from hot weather, saunas, or strenuous exercise can **concentrate lithium**. Drink more fluids and avoid extremes.

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Watch the Caffeine

Don't make sudden changes in coffee or tea intake — caffeine **increases lithium excretion** and can drop your level.

🤰

Pregnancy Planning

Use **reliable contraception**. Lithium can cause **heart defects** in the fetus. Tell your provider **before** trying to conceive.

8 Memory Boosters & Mnemonics

Pattern recognition · quick recall

✨ " L·I·T·H·I·U·M " — Side Effects & Care

L — **Leukocytosis** (mild, benign)

I — **Insipidus** (nephrogenic diabetes insipidus → polyuria/polydipsia)

T — **Tremor** (fine = OK · coarse = toxic) & **Thyroid** ↓ (hypothyroidism)

H — **Hydration** required · maintain consistent fluid & salt intake

I — **Interactions** — NSAIDs, thiazides, ACE-Is ↑ levels · caffeine ↓ levels

U — **Urine output** & renal function — monitor BUN/Cr · 100 % renal excretion

M — **Mania control** (first-line) · **Monitor** levels (0.6–1.2 mEq/L)

🎯 **The "Salt Rule":** **Low salt → high lithium · High salt → low lithium.** Lithium and sodium fight for the same kidney transporter — whoever loses gets dumped. Less Na^+ in the body means less competition, so the kidney holds onto lithium → toxicity.

🎯 **The "12-Hour Rule":** Lithium **trough levels** are always drawn **12 hours after the last dose**. Morning dose held until after the lab draw. Outside this window = the level is meaningless.

🎯 **The "Three GI Symptoms":** **N/V/D** (nausea, vomiting, diarrhea) are the **first warning signs of toxicity**. They also cause dehydration → which

causes more toxicity. A dangerous loop. **Always hold the dose.**

🎯 **"Lithium has a fence":** Therapeutic **0.6–1.2** is a narrow corral. Fall over the fence at **1.5** = toxic. **2.0** = severe. **3.0** = lethal. There is no antidote — only **hydration + dialysis**.

🎯 **Ebstein's = Elephant's heart:** Lithium in pregnancy → **Ebstein's anomaly** (tricuspid valve defect). Picture an "**E**lephant **E**arly in pregnancy" = avoid lithium in the first trimester.