

⚡ 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

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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** .

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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.



2

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



3

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



4

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



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

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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.

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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**.

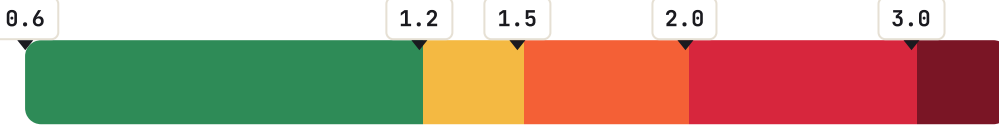
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Pharmacology Deep Dive

Levels · interactions · monitoring



Serum Lithium Level Spectrum (mEq/L)



0.6 - 1.2

Therapeutic /
Maintenance ✓

1.2 - 1.5

Acute mania
range / caution ⚠

1.5 - 2.0

Early toxicity 🟡

> 2.0

Severe → lethal
🔴

Lithium Carbonate

Mood Stabilizer · Antimanic

MECHANISM

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

EXCRETION

100% renal, unchanged.

Reabsorbed in the proximal tubule in **competition with Na^+** . Low Na^+ → Li^+ retention.

CONTRAINDICATIONS

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

ONSET / HALF-LIFE

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

COMMON SIDE EFFECTS

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

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)

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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**.



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.



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.



Keep Lab Appointments

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



Know the Warning Signs

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



Heat & Exercise

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



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.

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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 **"Elephant Early in pregnancy"** = avoid lithium in the first trimester.

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PSYCHOSOCIAL INTEGRITY & PHARMACOLOGICAL THERAPIES