DRUG NAME: LITHIUM
Brand names: Eskalith, Lithane, Lithobid, Lithonate, Lithotabs

General Information: Lithium is commonly used for acute and preventive treatment in bipolar disorder. It is one of an expanding group of drugs known as “mood stabilizers.” It is also used to augment other medicines in the treatment of depression, schizoaffective disorder, schizophrenia and other mental health conditions. It is used to help control chronic aggressive behavior. Lithium drugs are simple salts, lithium carbonate or lithium citrate. The mechanism of action of lithium is not completely understood, but is likely to involve effects on G-proteins and other “second messenger” molecules within neurons, which ultimately serves to re-regulate neuronal function. This is in contrast to antidepressant medicines, which operate on the “first messenger” neurotransmitters that communicate between neurons. Lithium is not habit-forming.

Guidelines for Use: Lithium is generally available in 300 mg. immediate-release as well as 300 and 450 mg. sustained-release tablets or capsules; a liquid preparation is also used in some situations. Some tablets can be broken in half to get the correct dose. Various brand and generic forms are available. It is important to swallow the sustained-release form whole to ensure smooth delivery of the drug over time. The usual starting dose is 300 to 600 mg. daily, often in divided doses. The dosage may be raised at 1 to 2 week intervals to achieve a therapeutic blood level (see below). The calming benefits of lithium on acute mania or hypomania are often apparent in 7 to 10 days, though stabilizing the mood within the normal range may take a few weeks. People on maintenance therapy with lithium may take it once daily, but some people have better results when they take it more than once daily. Maintenance therapy may be continued indefinitely. If you forget to take a dose of lithium, skip the missed dose; do not take double doses. Store the drug in a dry, tightly-closed, light-resistant container out of the reach of children.

Precautions: Do not take this drug if you have ever had an allergic reaction to lithium. Inform your clinician if you have any known drug allergies; if you have epilepsy, kidney, liver, or thyroid disease; if you are taking any other drug (prescription or non-prescription), vitamin, supplement or herb; if you will be undergoing anesthesia or surgery while taking this drug. Inform your clinician if you are or might be pregnant. Lithium can cause fetal harm. It can also cause toxicity to nursing babies, so breast-feeding while taking lithium is not advised. It has not been tested in children and is not recommended for use by infants or children. Elderly persons may need lower doses and may have side effects at lower blood levels than other adults. Diabetics taking lithium are at somewhat increased risk of ketoacidosis and should monitor blood glucose levels carefully.

Blood levels: Lithium has a narrow “therapeutic window,” which means that the difference between a therapeutic dose and a toxic dose is small. For this reason, blood levels of lithium are monitored, especially early in treatment. The standard protocol for measuring levels is to draw the blood sample in the morning approximately 12 hours after your evening dose of lithium and BEFORE you take your morning dose. You must
adhere to this protocol for the blood measurements to be meaningful to your clinician. If you have missed doses, you should delay getting the blood level drawn until you have taken the lithium exactly as ordered for 5 full days, or call your clinician for further instructions. The range of therapeutic blood levels of lithium is 0.5 to 1.5 mEq/L (milli-equivalents per liter of blood). Your clinician may set a target range of blood levels to best control your particular symptoms. At around 2.0 mEq/L, lithium toxicity occurs in most people. Dehydration increases toxicity; be sure to maintain good fluid intake when you are exercising, when the weather is hot, and when you are ill. Other factors that contribute to toxicity are high dosage of lithium, drug interactions, kidney impairment, a low-sodium diet, and advanced age.

**Toxicity:** Early signs of lithium toxicity include neurologic symptoms (marked hand tremor, dizziness, drowsiness, slurred speech, abnormal eye movements, lethargy or excitement, unsteady gait, muscle weakness) and gastrointestinal symptoms (nausea, vomiting, diarrhea, abdominal pain, dry mouth, poor appetite). As toxicity worsens with increasing blood level, more severe neurologic symptoms may appear (fainting, delirium, convulsions, stupor, coma). Dehydration increases toxicity; be sure to maintain good fluid intake when you are exercising, when the weather is hot, and when you are ill. Other factors that contribute to toxicity are high dosage of lithium, drug interactions, kidney impairment, a low-sodium diet, and advanced age.

**LITHIUM TOXICITY IS A MEDICAL EMERGENCY.** If you have mild toxic symptoms, STOP TAKING THE LITHIUM, drink non-caffeinated fluids, and call your clinician immediately. If you have serious symptoms, go to the nearest emergency room. It is also helpful to advise the people closest to you of the signs of lithium toxicity so they may help you recognize them and get appropriate treatment.

**Lithium may cause drowsiness,** especially early in treatment. If so, avoid driving or operating machinery until you are sure your alertness and coordination are not affected.

**Overdoses of lithium may be fatal.** Symptoms of overdose are the same as the symptoms of toxicity listed above. IMMEDIATE EMERGENCY MEDICAL CARE SHOULD BE SOUGHT IN CASES OF OVERDOSE.

**Interactions:**

**Alcohol:** You should not drink alcohol while taking lithium. Alcohol increases the side effects of lithium and may contribute to dehydration; lithium increases the effects of alcohol. Alcohol use may contribute to depression, so is not recommended for people experiencing mood swings.

**Food:** You should try to keep your sodium intake stable, including both table salt and salt from highly-processed or fast foods. Absorption of sodium and lithium are in dynamic equilibrium in the body, and any marked change in salt intake can disturb this balance. Large amounts of caffeine are not recommended due to excessive nervous
stimulation and possible dehydrating effects. Caffeine also reduces lithium blood levels so it may be less effective.

**Lab tests:** Lithium treatment can affect certain laboratory tests; inform any medical provider you see for any reason that you are taking lithium.

**Other drugs:** You should not take any of the non-steroidal anti-inflammatory drugs while taking lithium, as these drugs may increase blood levels and the risk of toxicity. This class of drugs includes ibuprofen (Advil, Motrin, Nuprin, Midol), naprosyn or naproxen sodium (Aleve), indomethacin (Indocin) and others. These drugs are also included in some combination cold/flu medicines, so it is important to check labels. You may use aspirin or Tylenol.

Some prescription drugs also increase lithium levels and risk of toxicity. Examples: many diuretics and blood pressure medicines, including thiazides, ACE inhibitors, and calcium channel blockers; the antibiotic tetracycline; antipsychotic medicines; antidepressant medicines; some anticonvulsants. (Note that antipsychotics, antidepressants and anticonvulsants are frequently used in combination with lithium to control the symptoms of bipolar disorder. Such combinations can be very effective, but they require careful monitoring and collaboration between patient and clinician.)

Theophylline drugs (Bronkaid, Primatene, Quibron, Slo-Phyllin, Theo-Dur, others) decrease lithium levels, which may reduce its effectiveness.

**Side Effects of Lithium:**

<table>
<thead>
<tr>
<th>Common Side Effects</th>
<th>Possible Remedies</th>
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<tbody>
<tr>
<td>--increased thirst</td>
<td>--frequent no-calorie fluids</td>
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<tr>
<td>--frequent urination</td>
<td>--report to clinician if severe</td>
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<tr>
<td>--nausea, vomiting, diarrhea, appetite loss</td>
<td>--take lithium with food and in divided doses; try a different form of lithium; try OTC preparations such as Pepto-Bismol, Imodium, Kaopectate, or Lomotil</td>
</tr>
<tr>
<td>--weight gain, fluid retention</td>
<td>--watch diet; exercise regularly; use no-calorie fluids to offset thirst; inform clinician</td>
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<tr>
<td>--tremor</td>
<td>--take lithium in divided doses; try a sustained-release form of lithium; reduce caffeine; may decrease with time; beta blockers are sometimes prescribed to reduce tremor</td>
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<tr>
<td>--fatigue, mild mental dullness</td>
<td>--be patient, as these may decrease with time</td>
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</tbody>
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Less-common Side Effects:

--acne, psoriasis, rash --try another form of lithium; usual treatments for these conditions

--hair loss --try another form of lithium

Note: Lithium is distributed throughout the body and may have effects on various organ systems, including the thyroid, the heart, and the kidneys. At the time lithium treatment is started, your clinician will likely take a medical history and order various screening studies and lab work, including thyroid function tests, electrolytes, and a creatinine level (a measure of kidney function). In addition, women of child-bearing age should have a pregnancy test and those over age 40 should have an electrocardiogram. Other tests may be ordered as needed. Blood levels of lithium are taken as often as weekly early in treatment and at more widely-spaced intervals later. The initial screening studies are usually repeated every 6 to 12 months as long as lithium is prescribed.

Recommended Reading: Bipolar Disorder by Francis Mark Mondimore, MD, Johns Hopkins Press, 1999.