PRESCRIPTION MONOGRAPH

Compounded Active Ingredients: Levothyroxine Sodium/Liothyronine Sodium
Form: Oral Capsule

Drug Class:

- Levothyroxine: Synthetic thyroid hormone (T4 analog)
- Liothyronine: Synthetic thyroid hormone (T3 analog)

Mechanism of Action[1]: Using levothyroxine with liothyronine can help replicate natural thyroid physiology.

- Levothyroxine is intended to restore circulating T4, which is converted to T3, activating thyroid receptors and regulating metabolism, growth, and development.
- Liothyronine is intended to directly supply active T3, bypassing conversion, and bind thyroid receptors to rapidly stimulate gene transcription and metabolic activity.

Indications Commonly Prescribed for:

- Hypothyroidism: Treatment of primary, secondary, or tertiary hypothyroidism (alone or in combination with levothyroxine).
- Thyroid suppression test: As part of diagnostic evaluation of thyroid function.

Before Use: Let your health care provider know if you have any medication allergies before you take this compounded preparation. Let your health care provider know if you have any liver or kidney problems. Let your healthcare provider know of all supplements you are currently taking.

Contraindications:

- Uncorrected adrenal insufficiency.
- Untreated thyrotoxicosis.
- Known hypersensitivity to levothyroxine or liothyronine.

Cautions: Let your Healthcare provider know if you experience any adverse side effects.

How to Use: This compounded preparation is in the form of an oral capsule. Swallow the capsule whole with a glass of water. Do not chew or crush the capsule. If you miss a dose, take as soon as you remember, but not at the time for the next dose. Desired results may take up to several weeks.

Warnings and Precautions:

- Do not use for weight loss: ineffective and potentially life-threatening when combined with sympathomimetics.
- Cardiovascular risk: Both agents can exacerbate angina, arrhythmias, and heart failure — start low and titrate carefully in elderly or cardiac patients.
- Bone health: Chronic overtreatment increases risk of osteoporosis.
- Malabsorption risks: Absorption reduced by GI disorders (celiac disease, atrophic gastritis, IBD) and interfering medications.

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Adverse Reactions:

- Common
  - Headache
  - Insomnia, irritability,
  - Menstrual irregularities
- Signs of Over-Replacement
  - Palpitations, tachycardia, arrhythmias
  - Tremor, anxiety, sweating, chest pain
  - Diarrhea, weight loss.

Interactions:

- Absorption reduced by calcium, iron, bile acid sequestrants, sucralfate, and aluminum antacids; separate administration by several hours.
- Proton pump inhibitors and H2 blockers may lower absorption.
- CYP inducers such as phenytoin, carbamazepine, and rifampin can increase metabolism, lowering hormone levels.
- Estrogens and oral contraceptives increase thyroxine-binding globulin, often raising dose requirements.
- Warfarin effect may be potentiated.
- Insulin and oral diabetes medications may need adjustment.
- Sympathomimetics combined with thyroid hormones may increase risk of arrhythmia.

Use in Specific Populations:

- Pregnancy: Safe and essential; requirements often increase (monitor every 4 weeks in first half of pregnancy).
- Lactation: Minimal transfer into breast milk; considered safe.
- Elderly/heart disease: Start at low doses (12.5–25 mcg daily), titrate slowly.
- Pediatrics: Critical in congenital hypothyroidism for normal neurodevelopment; dose based on weight.

Storage:

- Store in original container at room temperature (up to 30°C or 86°F)
- Store in a cool dry place away from heat, sunlight, and moisture

Monitoring Parameters:

- TSH and free T4/free T3: Recheck 4–6 weeks after initiation or dose change.
- Cardiac monitoring: Watch for palpitations, tachyarrhythmias, or chest pain.
- Clinical monitoring: Track energy, weight, mood, sleep, menstrual cycles, and symptoms of over/under-treatment.
- Bone health: Consider periodic BMD in long-term therapy (esp. postmenopausal women).

Citations:

1. Nassar M, Hassan A, Ramadan S, Desouki MT, Hassan MA, Chaudhuri A. Evaluating the effectiveness of combined T4 and T3 therapy or desiccated thyroid versus T4 monotherapy in hypothyroidism: a systematic review and meta-analysis. *BMC Endocr Disord*. 2024;24(1):90. Published 2024 Jun 14. doi:10.1186/s12902-024-01612-6