**liothyronine** (lye-oh-thye-roe-neen)  
Cytomel, l-triiodothyronine, T3, Triostat

**Classification**  
Therapeutic: hormones  
Pharmacologic: thyroid preparations

**Pregnancy Category A**

**Indications**  
Thyroid supplementation in hypothyroidism. Treatment or suppression of endogenous goiters. Diagnostic agent for suppression tests to differentiate mild hyperthyroidism from thyroid gland autonomy. Treatments of myxedema coma (IV formulation).

**Action**  
Replacement of or supplementation to endogenous thyroid hormones. Principal effect is increasing metabolic rate of body tissues: Promote gluconeogenesis, Increase utilization and mobilization of glycogen stores, Stimulate protein synthesis, Promote cell growth and differentiation, Aid in the development of the brain and CNS.  
**Therapeutic Effects:** Replacement in hypothyroidism to restore normal hormonal balance.

**Pharmacokinetics**  
**Absorption:** Liothyronine is well absorbed.  
**Distribution:** Distributed into most body tissues. Thyroid hormones do not readily cross the placenta, minimal amounts enter breast milk.  
**Metabolism and Excretion:** Metabolized by the liver and other tissues. Thyroid hormone undergoes enterohepatic recirculation and is excreted in the feces via the bile.  
**Half-life:** 1–2 days.

**TIME/ACTION PROFILE**  
**ROUTE** ONSET PEAK DURATION  
Liothyronine PO unknown 24–72 hr 72 hr  
Liothyronine IV unknown unknown unknown

**Contraindications/Precautions**  
**Contraindicated in:** Hypersensitivity; Recent MI; Hyperthyroidism.  
**Use Cautiously in:** Cardiovascular disease (initiate therapy with lower doses); Severe renal insufficiency; Uncorrected adrenocortical disorders; Geri: q sensitivity to thyroid hormones; initial dose should be p.

**Adverse Reactions/Side Effects**  
Usually only seen when excessive doses cause iatrogenic hyperthyroidism  
**CNS:** Insomnia, irritability, headache.  
**CV:** Arrhythmias, tachycardia, angina pectoris.  
**GI:** Abdominal cramps, diarrhea, vomiting.  
**Derm:** Hyperhidrosis.  
**Endo:** Hyperthyroidism, menstrual irregularities.  
**Metab:** Weight loss, heat intolerance.  
**MS:** Accelerated bone maturation in children.

**Interactions**  
**Drug-Drug:** Bile acid sequestrants p absorption of orally administered thyroid preparations. Alters the effectiveness of warfarin (INR will q with thyroid hormone supplementation). May q requirement for insulin or oral hypoglycemic agents in diabetics. Concurrent estrogen therapy may q thyroid replacement requirements. q cardiovascular effects with adrenergics (sympathomimetics).

**Route/Dosage**  
**PO (Adults):**  
Mild hypothyroidism—25 mcg once daily; may q 12.5–25 mcg/day q 1–2 wk intervals; usual maintenance dose is 25–50 mcg/day. Thyrotoxicosis—2.5–5 mcg once daily initially; 5 mcg–10 mcg q 1–2 wk up to 25 mcg/day; then ↑ by 12.5–25 mcg/day; usual maintenance dose is 25–50 mcg/day. Simple goiter—5 mcg once daily initially; 10 mcg–20 mcg q 1–2 wk up to 25 mcg/day; then ↑ by 25–50 mcg/day until desired effect is obtained; usual maintenance dose is 50–100 mcg/day. T3 suppression test—75–100 mcg daily for 7 days. Repeated every 3 months before and after 7-day course.  
**PO (Geriatric Patients or Patients with Cardiovascular Disease):** 5 mcg/day initially; ↑ by no more than 5 mcg/day q 2 wk.  
**IV (Adults):** Myxedema coma—25–50 mcg initially, if cardiovascular disease is present, initial dose should be 10–20 mcg. Additional doses may be given, to a total
NURSING IMPLICATIONS

Assessment
- Assess apical pulse and BP prior to and periodically during therapy.
- Assess for tachyarrhythmias and chest pain.

Children
- Monitor height, weight, and psychomotor development.

Lab Test Considerations
- Monitor thyroid function studies prior to and during therapy.
- Monitor blood and urine glucose in diabetic patients. Insulin or oral hypoglycemic doses may need to be increased.

Toxicity and Overdose:
- Overdose is manifested as hyperthyroidism (tachycardia, chest pain, nervousness, insomnia, diaphoresis, tremors, weight loss). Emergency treatment is to withhold dose for 2–6 days. Acute overdose is treated by induction of emesis or gastric lavage, followed by activated charcoal. Symptomatic overstimulation may be controlled by antiadrenergic drugs (beta blockers), such as propranolol. Oxygen and supportive measures to control symptoms are also used.

Potential Nursing Diagnoses
- Deficient knowledge, related to medication regimen (Patient/Family Teaching)

Implementation
- PO: Administer as a single dose, preferably before breakfast to prevent insomnia.
- Initial dose is low, especially in geriatric and cardiac patients. Dose is increased gradually, based on response to therapy. Side effects occur more rapidly with liothyronine because of its rapid onset of effect.
- For patients with difficulty swallowing, tablets can be crushed and placed in 5–10 mL of water and administered immediately via dropper or spoon; do not store suspension.

IV Administration
- pH: No Data.
- IV: Liothyronine injection is for IV use only. Do not give IM or subcut. Administer doses at least 4 hr and not more than 12 hr apart.

Patient/Family Teaching
- Instruct patient to take medication as directed at the same time each day. Take missed doses as soon as remembered unless almost time for next dose. If more than 2–3 doses are missed, consult health care professional.

Potential nursing diagnoses related to medication regimen (Patient/Family Teaching)
- Deficient knowledge, related to medication regimen

Evaluation/Desired Outcomes
- Resolution of symptoms of hypothyroidism and normalization of hormone levels.