### Hypothyroidism

<table>
<thead>
<tr>
<th>Use</th>
<th>Half-life: 6–7 days</th>
<th>Onset: PO: UK IV: 6–8 h Peaks: 24 h–1 wk 24–48 h</th>
<th>Duration: 1–3 wk UK</th>
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</table>

**Example** Levothyroxine (Synthroid)  
**Route:** PO/IV  
**Pregnancy category:** A  
**Pharmacokinetic:** Variable incomplete absorption from GI tract. PB: >99%; widely distributed; deiodinated in peripheral tissues, minimal metabolism in liver; eliminated by biliary excretion.

**How it works**  
- Involved in normal metabolism, growth and development (especially CNS of infants). Possesses catabolic and anabolic effects. Increases basal metabolic rate, enhances gluconeogenesis, stimulates protein synthesis.

**Adult dose**  
**Hypothyroidism:**  
- PO: Initially 0.05 mg/day. Increase by 0.025 mg q2–3 wks. Maintenance: 0.1–0.2 mg/day.

Myxedema coma or stupor (medical emergency):  
- IV: Initially 0.4 mg. Follow with daily supplements at 0.2–0.2 mg. Maintenance: 0.05–0.1 mg/day.

**Thyroid suppression therapy:**  
- PO: 2–6 mcg/kg/day for 7–10 days.

**TSH suppression in thyroid cancer, nodules, euthroid goiters:**  
- Use larger doses than that used for replacement therapy.
### Hypothyroidism (continued)

| Adult dose (continued) | Congenital hypothyroidism:  
| | • >0.15/mg/day.  
Usual parenteral dosage:  
| | IV: Initial dosage approximately one-half the previously established oral dosage.  

| Before administration | • Question for hypersensitivity to tartrazine, aspirin, lactose.  
| | • Obtain baseline weight, vital signs.  
| | • Signs and symptoms of diabetes mellitus or diabetes insipidus, adrenal insufficiency, hypopituitarism may become intensified.  
| | • Treat with adrenocortical steroids prior to thyroid therapy in coexisting hypothyroidism and hypoadrenalism.  

| Administration | • Note: Do not interchange brands because there have been problems with bioequivalence between manufacturers.  
| | • PO: Give at same time each day to maintain hormone levels.  
| | • Administer before breakfast to avoid insomnia.  
| | • Tablets may be crushed.  
| | • IV: Use immediately after reconstitution of 200 mcg or 500 mcg vial with 5 mL 0.9 NaCl to provide a concentration of 40 or 100 mcg/mL respectively; shake until clear; use immediately and discard unused portion; given each 100 mcg or less over 1 min.  

| After administration | • Monitor pulse for rate, rhythm (report pulse of 100 or marked increase from baseline).  
| | • Assess for tremors, nervousness.  
| | • Check appetite and sleep pattern.  

| Contraindications | • Thyrotoxicosis and myocardial infarction uncomplicated by hypothyroidism, hypersensitivity to any component (with tablets: tartrazine, allergy to aspirin, lactose intolerance); treatment of obesity.  
| | • Caution: Elderly, angina pectoris, hypertension or other cardiovascular disease.  

### Hypothyroidism  *(continued)*

| Side effects/ adverse reaction | Occasional: Children may have reversible hair loss upon initiation.  
|                               | Rare: Dry skin, GI intolerance, skin rash, hives, pseudotumor cerebri (severe headache in children).  
| Adverse/toxic:                | Excessive dosage produces signs/symptoms of hyperthyroidism: weight loss, palpitations, increased appetite, tremors, nervousness, tachycardia, increased B/P, headache, insomnia, menstrual irregularities. Cardiac arrhythmias occur rarely. |

| Patient education             | Do not discontinue: replacement for hypothyroidism is lifelong.  
|                               | Follow up with health care visits and thyroid functions tests as ordered.  
|                               | Take medication at the same time every day preferably in the morning.  
|                               | Monitor pulse, report marked increase, pulse of 100 or above, change of rhythm.  
|                               | Do not change brands.  
|                               | Notify provider promptly of chest pain, weight loss, nervousness or tremors, and insomnia.  
|                               | Children may have reversible hair loss or increased aggressiveness during the first few months of therapy.  
|                               | Full therapeutic effect may take 1–3 weeks. |