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**labetalol (la-bet-a-low)**

- **Trandate**

**Classification**

Therapeutic: antihypertensives, antanginals

Pharmacologic: beta blockers

Pregnancy Category C

**Indications**

Management of hypertension.

**Action**

Blocks stimulation of beta1 (myocardial)- and beta2 (pulmonary, vascular, and uterine)-adrenergic receptor sites. Also has alpha1-adrenergic blocking activity, which may result in more orthostatic hypotension.

**Therapeutic Effects:**

Decreased BP.

**Pharmacokinetics**

**Absorption:** Well absorbed but rapidly undergoes extensive first-pass hepatic metabolism, resulting in 25% bioavailability.

**Distribution:** Some CNS penetration; crosses the placenta.

**Protein Binding:** 50%.

**Metabolism and Excretion:** Undergoes extensive hepatic metabolism.

**Half-life:** 3–8 hr.

**TIME/ACTION PROFILE (cardiovascular effects)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>20 min–2 hr</td>
<td>1–4 hr</td>
<td>8–12 hr</td>
</tr>
<tr>
<td>IV</td>
<td>2–5 min</td>
<td>5 min</td>
<td>16–18 hr</td>
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</tbody>
</table>

**Contraindications/Precautions**

Contraindicated in:

- Uncompensated HF
- Pulmonary edema
- Cardiogenic shock
- Bradycardia or heart block.

Use Cautiously in:

- Renal impairment
- Hepatic impairment
- Pulmonary disease (including asthma)
- Diabetes mellitus (may mask signs of hypoglycemia)
- Thyrotoxicosis
- Patients with a history of severe allergic reactions (intensity of reactions may be >1)
- OB: May cause fetal/neonatal bradycardia, hypotension, hypoglycemia, or respiratory depression; lactation: Usually compatible with breast feeding (AAP); Lactation: Limited data available; ADE: Sensitivity to beta blockers (risk of orthostatic hypotension); initial dosage recommended.

**Adverse Reactions/Side Effects**

- **CNS:** Fatigue, weakness, anxiety, depression, dizziness, drowsiness, memory loss, mental status changes, nightmares.
- **EENT:** Blurred vision, dry eyes, intraocular pressure, nasal stuffiness.
- **Resp:** Bronchospasm, wheezing.
- **CV:** Arrhythmias, bradycardia, CHF, pulmonary edema, orthostatic hypotension.
- **GI:** Constipation, diarrhea, nausea.
- **GU:** Erectile dysfunction, libido.
- **Derm:** Itching, rashes.
- **Endo:** Hyperglycemia, hypoglycemia.
- **MS:** Arthralgia, back pain, muscle cramps.
- **Neuro:** Paresthesia.

**Interactions**

- **Drug-Drug:** General anesthesia and verapamil may cause additive myocardial depression. Additive bradycardia may occur with atropine, verapamil, or diltiazem. Additive hypotension may occur with other antihypertensives, acute ingestion of alcohol, or nitrites. Concurrent thyroid administration may affect effectiveness. May alter the effectiveness of insulin or oral hypoglycemic agents (dose adjustments may be necessary). May alter the effectiveness of adrenergic bronchodilators and sympathomimetics. May mask beneficial beta adrenergic effects of dopaminergic or adrenergic bronchodilators. Use cautiously within 14 days of MAO inhibitor therapy (may result in hypertension). Effects may be potentimized or antagonized. Concurrent NSAIDs may potentiate antihypertensive action.

**Route/Dosage**

- **PO (Adults):** 100 mg twice daily initially, may be increased by 100 mg twice daily q 2–3 days as needed (usual range 400–800 mg/day in 2–3 divided doses; doses up to 1.2–2.4 g/day have been used).
- **PO (Infants and Children):** 1–3 mg/kg/day divided BID (maximum dose: 10–12 mg/kg/day, up to 1200 mg/day).
- **IV (Adults):** 20 mg (0.25 mg/kg) initially, additional doses of 40–80 mg may be given q 5 min as needed (not to exceed 300 mg total dose) or 2 mg/min infusion (range 50–300 mg total dose required).
- **IV (Infants and Children):** 0.2–1 mg/kg/dose (maximum: 40 mg/kg/day).

**Contraindicated in:** Uncompensated HF, Pulmonary edema, Cardiogenic shock, Bradycardia or heart block.

**Use Cautiously in:** Renal impairment, Hepatic impairment, Pulmonary disease (including asthma), Diabetes mellitus (may mask signs of hypoglycemia), Thyrotoxicosis, Patients with a history of severe allergic reactions (intensity of reactions may be >1), OB: May cause fetal/neonatal bradycardia, hypotension, hypoglycemia, or respiratory depression; lactation: Usually compatible with breast feeding (AAP); Lactation: Limited data available; ADE: Sensitivity to beta blockers (risk of orthostatic hypotension); initial dosage recommended.
NURSING IMPLICATIONS

Assessment
- Monitor BP and pulse frequently during dose adjustment and periodically during therapy. Assess for orthostatic hypotension when assisting patient from recumbent position.
- Check frequency of refills to determine compliance.
- Patients receiving labetalol IV must be supine during and for 3 hr after administration. Vital signs should be monitored every 5–15 min during and for several hours after administration.
- Monitor intake and output ratios and daily weight. Assess patient routinely for evidence of fluid overload (peripheral edema, dyspnea, rales/crackles, fatigue, weight gain, jugular venous distention).
- Lab Test Considerations: May cause q BUN, serum lipoprotein, potassium, triglycerides, and uric acid levels.
- May cause q ANA titers.
- May cause q in blood glucose levels.
- May cause q serum alkaline phosphatase, LDH, AST, and ALT levels. Discontinue if jaundice or laboratory signs of hepatic function impairment occur.
- Toxicity and Overdose: Monitor patients receiving beta blockers for signs of overdose (bradycardia, severe dizziness or fainting, severe shortness of breath, blood pressure or pulse, seizures). Notify health care professional immediately if these signs occur.
- Glucagon has been used to treat bradycardia and hypotension.

Potential Nursing Diagnoses
Decreased cardiac output (Side Effects)
Noncompliance (Patient/Family Teaching)

Implementation
- High Alert: IV vasoactive medications are inherently dangerous. Before administering intravenously, have second practitioner independently check original order, dosage calculations, and infusion pump settings.
- Do not confuse labetalol with Lamictal.
- Discontinue concurrent dopamine should take place gradually, with beta blocker discontinued first. Then, after several days, discontinue dopamine.
- PO: Take apical pulse prior to administering. If $50 bpm or arrhythmia occurs, withhold medication and notify health care professional. Avoid administering with foods high in fat to enhance absorption.
- Avoid administering within 1 hr of food.

IV Administration
- Direct IV: Labetalol—Administer undiluted. Concentration: 5 mg/mL. Rate: Administer slowly over 2 min.
- Continuous infusion: Labetalol—Add 200 mg of labetalol to 160 mL of D5W or 0.9% NaCl. Concentration: Diluted: 1 mg/mL. Rate: Administer at a rate of 2 mg/min. Titrate for desired response. Infuse using infusion pump to ensure accurate dose.
labetalol

**CONTRAINDICATIONS:**

- Hypotension
- Headache
- Migraine
- Gingival hyperplasia
- Hypersensitivity to drugs in this class

**Precautions:**

- Labetalol may be used in conjunction with other antihypertensive agents.

**Drug Interactions:**

- **CYP3A4 inhibitors:**
  - Ketoconazole
  - Clarithromycin
  - Itraconazole

- **CYP3A4 inducers:**
  - Phenytoin
  - Carbamazepine

**Adverse Effects:**

- **Cardiovascular:**
  - Bradycardia
  - Tachycardia

- **Respiratory:**
  - Bronchospasm

- **Skin:**
  - Rash

- **Gastrointestinal:**
  - Diarrhea

**Dosage and Administration:**

- **Adults:**
  - Oral: 200-400 mg/day in divided doses
  - IV: 20 mg/hr

**Patient/Family Teaching:**

- Instruct patient to take medication as directed, at the same time each day, even if feeling well; do not skip or double up on missed doses. Take missed doses as soon as possible up to 6 hr before next dose. Abrupt withdrawal may precipitate life-threatening arrhythmias, hypotension, or myocardial ischemia.

- Advise patient to make sure enough medication is available for weekends, holidays, and vacations. A written prescription may be kept in wallet in case of emergency.

- Teach patient and family how to check pulse and BP. Instruct them to check pulse daily and BP biweekly. Advise patient to hold dose and contact health care professional if pulse is ≥ 50 bpm or BP changes significantly.

- May cause drowsiness or dizziness. Caution patients to avoid driving or other activities that require alertness until response to the drug is known. Carcin patients receiving labetalol IV to call for assistance during ambulation or transfer.

- Advise patient to make position changes slowly to minimize orthostatic hypotension, especially during initiation of therapy or when dose is increased. Patients taking oral labetalol should be especially cautious when drinking alcohol, standing for long periods, or exercising, and during hot weather, because orthostatic hypotension is enhanced.

- Carcin patients taking this medication may increase sensitivity to cold.

- Instruct patient to notify health care professional of medication regimen prior to treatment or surgery.

- Advise patient to carry identification describing disease process and medication regimen at all times.

**Hypertension:**

- Reinforce the need to continue additional therapies for hypertension (weight loss, sodium restriction, stress reduction, regular exercise, moderation of alcohol consumption, and smoking cessation). Medication controls but does not cure hypertension.

**Evaluation/Desired Outcomes:**

- Decrease in BP.