**metaproterenol**  
**met-a-proe-ter-e-nole**

**Classification**  
Therapeutic: bronchodilators  
Pharmacologic: adrenergics

**Pregnancy Category:** C

**Indications**  
Treatment/prevention of bronchospasm due to reversible airway disease (a short-term control agent).

**Action**

Results in the accumulation of cyclic adenosine monophosphate (cAMP) at beta-2 adrenergic receptors. Produces bronchodilation. Inhibits the release of mediators of immediate hypersensitivity reactions from mast cells. Relatively selective for beta_2(adrenergic) adrenergic receptor sites, with less effect on beta_1(adrenergic) adrenergic receptors. Therapeutic Effects: Bronchodilation.

**Pharmacokinetics**

**Absorption:** Small amounts may be systemically absorbed following inhalation, but rapidly undergo extensive metabolism.  
**Distribution:** Unknown.  
**Metabolism and Excretion:** Extensively metabolized by the liver and other tissues.  
**Half-life:** Unknown.

**TIME/ACTION PROFILE (bronchodilation)**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>ONSET</th>
<th>PEAK</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>30 min</td>
<td>1 hr</td>
<td>1–5 hr</td>
</tr>
<tr>
<td>Inhaln-IPPB</td>
<td>5–30 min</td>
<td>unknown</td>
<td>2–6 hr</td>
</tr>
</tbody>
</table>

**Contraindications/Precautions**

**Contraindicated in:** Hypersensitivity to adrenergic amines; Selected products may contain bisulfites or alcohol (in some oral liquid preparations) and should be avoided in patients with known hypersensitivity to these ingredients.

- *Cardinal drug name*  
- *Generic Implication*  
- **OPTIX** indicates life-threatening side effects indicate most frequent

**Use Cautiously in:** Cardiac disease; Hypertension; Hyperthyroidism; Diabetes; Glaucoma; GLP: More susceptible to adverse reactions; may require dose adjustment.  
**Notify physician:** Pregnancy (near term) and lactation.

**Adverse Reactions/Side Effects**

**CNS:** nervousness, restlessness, tremor, headache, insomnia.  
**Resp:** PARADOXICAL BRONCHOSPASM (excessive use of inhalers).  
**CV:** angina, arrhythmias, hypertension, tachycardia.  
**GI:** nausea, vomiting.  
**Endo:** hyperglycemia.

**Drug-Drug:** Concurrent use with other adrenergics (sympathomimetic) will have additive adrenergic side effects. Use with MAO inhibitors may lead to hypertensive crisis. Beta blockers may negate therapeutic effect.  
**Drug-Natural Products:** Use with caffeine-containing herbs (cola nut, guarana, mate, tea, coffee) may potentiate effect.

**Route/Dosage**

<table>
<thead>
<tr>
<th>ROUTE</th>
<th>OFFICE</th>
<th>MAX</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO (Adults and Children ≥ 9 yr):</td>
<td>20 mg</td>
<td>3–4 times/day</td>
<td></td>
</tr>
<tr>
<td>PO (Children 6–9 yr):</td>
<td>10 mg</td>
<td>3–4 times/day</td>
<td></td>
</tr>
<tr>
<td>PO (Children 2–6 yr):</td>
<td>5–10 mg/kg/dose</td>
<td>3–4 times/day</td>
<td></td>
</tr>
<tr>
<td>Inhaln (Adults and Children ≥ 12 yr):</td>
<td>0.2–0.3 mL of 5% solution or 2.5 mL of 0.4–0.6% solution for nebulization</td>
<td>3–4 times daily</td>
<td></td>
</tr>
<tr>
<td>Inhaln (Children &lt; 1 yr):</td>
<td>0.5–1 mg/kg</td>
<td>0.01–0.02 mL/kg/min (0.5% solution via nebulization) q 6–8 hr maximum dose 0.1 mL/kg (5 mg) maximum dose 0.3 mL (15 mg)</td>
<td></td>
</tr>
</tbody>
</table>

**NURSING IMPLICATIONS**

**Assessment**

- **Bronchodilator:** Auscult lung sounds, respiratory pattern, pulse, and BP before administration and during peak of medication. Note amount, color, and character of sputum produced. Report abnormal findings.  
- **Monitor pulmonary function tests before and periodically during therapy to determine effectiveness of medication.**  
- **Observe for paradoxic bronchospasm (wheezing).** If condition occurs, withhold medication and notify health care provider immediately.
Observe for drug tolerance and rebound bronchospasm. Patients requiring more than 3 inhalation treatments in 24 hr should be under close supervision. If minimal or no relief is seen after 3–5 inhalation treatments within 6–12 hr, further treatment with aerosol alone is not recommended.

Lab Test Considerations:
May cause serum potassium concentrations; usually transient and dose related; rarely occurs at recommended doses and is more pronounced with frequent use of high doses.

Toxicity and Overdose:
Symptoms of overdose include persistent agitation, chest pain or discomfort, decreased BP, dizziness, hyperglycemia, hypokalemia, seizures, tachyarrhythmias, persistent trembling, and vomiting.

Treatment includes discontinuing beta-adrenergic agonists and sympotomatically supportive therapy. Cardioselective beta-adrenergic blocking agents are used cautiously as they may induce bronchospasm.

Potential Nursing Diagnoses

Ineffective airway clearance

Implementation

PO: Give with food to minimize GI distress.

Inhaln: For IPPB administration, dilute each dose in 2–3 mL of 0.9% NaCl. Do not use if solution is brown or darker than slightly yellow, if it contains a precipitate.

Patient/Family Teaching

Instruct patient to take medication as directed. If on a scheduled dosing regimen, take a missed dose as soon as possible; space remaining doses at regular intervals. Do not double doses. Caution patient not to exceed recommended dose; may cause adverse effects, paradoxical bronchospasm, or loss of effectiveness of medication.

Instruct patient to contact health care professional immediately if shortness of breath is not relieved by medication or is accompanied by diaphoresis, tachypnea, palpitations, or chest pain.

Advise patient to maintain adequate hydration (2000–3000 mL/day) to help liquefy tenacious secretions.

Inhaln:

Advise patient to rinse mouth with water after each inhalation dose to minimize dry mouth.

Advise patient to use bronchodilator first if using other inhalation medications, and allow 5 min to elapse before administering other inhalant medications, unless otherwise directed.

Advise patient to rinse mouth with water after each inhalation dose to minimize dry mouth.

Advise patient to maintain adequate fluid intake (2000–3000 mL/day) to help liquefy tenacious secretions.

Evaluation/Desired Outcomes

Prevention or relief of bronchospasm.

Increase in ease of breathing.

Prevention of exercise-induced asthma.

Why was this drug prescribed for your patient?