# Propranolol HCl

## Brand names

| Brand names | Inderal, generic |

## Medication error potential

High-alert medication (adrenergic agonist) that has an increased risk of causing significant patient harm if it is used in error.\(^{(1)}\)

Look-alike, sound-alike drug names. Confusion has been reported between Inderal and Adderall\(^{(2,3)}\) and between Inderal and Enduron, Imdur, Imuran, Inderide, Isordil, and Toradol.\(^{(2)}\)

*Significant differences exist between oral and IV dosing. Use caution when converting from one route of administration to another.*

## Contraindications and warnings

### U.S. boxed warning:

Abrupt withdrawal in patients with coronary artery disease may exacerbate angina or precipitate myocardial infarction; hence, propranolol should be gradually discontinued over about 2 weeks.\(^{(4)}\)

### Contraindications:

Known hypersensitivity to propranolol or any of the components of the formulation.\(^{(4)}\) Patients with a history of anaphylactic reactions may be more reactive to a repeated allergen challenge and may not respond to doses of epinephrine used to treat an allergic reaction.\(^{(4,23)}\) Propranolol is contraindicated in cardiogenic shock; sinus bradycardia and greater than first-degree block.\(^{(4)}\)

### Other warnings:

Use cautiously in patients with diabetes mellitus as propranolol may block hypoglycemia-induced tachycardia and blood pressure changes.\(^{(4)}\) Acute elevations in blood pressure have been reported after insulin-induced hypoglycemia.\(^{(4)}\) Beta blockers may aggravate arterial insufficiency and should be used with caution in those with peripheral vascular disease.\(^{(4)}\) Propranolol should be used cautiously in patients with asthma or bronchospastic disease.\(^{(4)}\)

## Infusion-related cautions

Rapid administration may cause hypotension and cardiac standstill.\(^{(4,5)}\)

## Dosage

*Significant differences exist between oral and IV dosing. Use caution when converting from one route of administration to another.*

### Arrhythmias:

0.01–0.25 mg/kg (maximum dose 1 mg) over 10 minutes\(^{(6-9)}\) not to exceed 1 mg/min.\(^{(4)}\) Repeat dose every 2 minutes.\(^{(6,7)}\) (See the Maximum Dosage section.) IV propranolol was successfully used to treat a 9-year-old girl with catecholaminergic polymorphic ventricular tachycardia, a rare genetic disorder.\(^{(22)}\)

### Burn patients:

0.5–1 mg/kg q 4–8 hr for 5–10 days.\(^{(10-12)}\) Used to decrease heart rate, cardiac work, and metabolic stress associated with severe burn.\(^{(24)}\)

### Hypertensive emergency:

IV labetalol is the preferred beta blocker.\(^{(13,14)}\) If propranolol is used, give 0.01 mg/kg over 10 minutes; may repeat every 6–8 hours (maximum dose 0.15 mg/kg).

### Infundibular spasm (“Tet” spell):

Oxygen should be given before propranolol.\(^{(15)}\) 0.01–0.02 mg/kg over 10 minutes and titrate to effect (up to 0.1–0.2 mg/kg/dose).\(^{(16-18)}\) May repeat dose in 15 minutes.\(^{(17,18)}\) Maximum initial dose is 1 mg.\(^{(17)}\) One study suggests starting doses of 0.15–0.25 mg/kg/dose infused over 10 minutes followed by one repeat dose if needed.\(^{(15)}\)

## Dosage adjustment in organ dysfunction

No adjustment in renal dysfunction.\(^{(19)}\) Use cautiously in hepatic dysfunction and consider dosage reduction.

## Maximum dosage

0.2 mg/kg,\(^{(7,16)}\) not to exceed 1 mg as initial dose for infants.\(^{(14,6,16)}\) Although the AAP recommends a maximum initial dose in children of 10 mg,\(^{(6)}\) the usual dose for adults is 1–3 mg.\(^{(4)}\)

## Additives

None reported
### Suitable diluents

D5W, NS, D5NS, D5½NS, ½NS, LR\(^{(20)}\)

### Maximum concentration

1 mg/mL\(^{(20)}\)

### Preparation and delivery

*Parenteral products should be visually inspected for particulate matter and discoloration before use. Refer to appropriate references for more information on compatibility with other drugs and solutions; compatibility following Y-site delivery, and suggested storage and extended stability.*\(^{(20)}\)

**Stability:** Store at room temperature and protect from freezing or excessive heat. Once diluted product is stable in D5W or NS for 24 hours at room temperature.\(^{(20)}\)

**Photosensitivity:** Protect from light.\(^{(20)}\)

### IV push

Not recommended\(^{(4)}\)

### Intermittent infusion

1 mg/mL\(^{(20)}\) administered over 10 minutes.\(^{(4,6)}\) Not to exceed 1 mg/min.\(^{(4)}\)

### Continuous infusion

Not used

### Other routes of administration

None reported

### Comments

**Monitoring:** ECG, blood pressure, and heart rate should be monitored during IV administration.

**Drug interactions:** Consult appropriate resources for dosing recommendations before combining any drug with propranolol. Propranolol is primarily metabolized by CYP2D6.\(^{(4)}\)

**Pharmacodynamic considerations:** Caution should be exercised when administering propranolol with drugs that slow atrioventricular nodal conduction (e.g., digitalis, lidocaine, and calcium channel blockers).\(^{(4)}\)

### REFERENCES