Propranolol

Newborn use only

2019

Alert	**For dosing on infantile haemangiomas – please refer to "Propranolol for Infantile Haemangioma" formulary.** For infants with comorbidities that are likely to lead to hypoglycaemia (e.g. hyperinsulinism/preterm/low weight) – dose schedule needs to be cautious. Ensure infant has adequate enteral or parenteral nutrient intake.
Indication	Supraventricular and ventricular tachycardia Prevention of hypercyanotic episodes in unrepaired Tetralogy of Fallot Hypertrophic cardiomyopathy Systemic hypertension Thyrotoxicosis – treatment of sympathetic overactivity Phaeochromocytoma (with an alpha-blocker) Retinopathy of prematurity (not recommended) Infantile haemangioma – Please refer to "Propranolol for Infantile Haemangioma" formulary.
Action	Beta-blockers competitively block beta-adrenoceptors in heart, peripheral vasculature, bronchi, pancreas, uterus, kidney, brain and liver. Beta-blockers reduce heart rate, blood pressure (BP) and cardiac contractility; also depress sinus node rate and slow conduction through the atrioventricular (AV) node and prolong atrial refractory periods.
Drug Type	Beta-adrenergic blocker
Trade Name	Deralin, Inderal tablets, Hemangiol, Propranolol Auspman
Presentation	Deralin, Inderal, tablet 10 mg, 40 mg Deralin tablet 160 mg Propranolol (Auspman) 2 mg/mL Oral Solution Hemangiol 3.75 mg/mL Oral Solution Propranolol suspension (formulas for multiple concentrations exist) compounded by Pharmacy Department
Dosage / Interval	**Cardiac conditions and hypertension:** Commence at 0.5–1 mg/kg/dose* 8 hourly and increase to 1–2 mg/kg/dose 8 hourly once dose tolerated. *For infants with comorbidities that are likely to lead to hypoglycaemia (e.g. hyperinsulinism/preterm/low weight) – commence at 0.5 mg/kg/dose 8 hourly and increase to 1–2 mg/kg/dose 8 hourly as tolerated. **Thyrotoxicosis:** 1–2 mg/kg/day in 2–3 divided doses to be titrated to heart rate and in consultation with endocrinologist/cardiologist. **Phaeochromocytoma**: See evidence review. **Retinopathy of prematurity**: See evidence review.
Maximum daily dose	Hypertrophic cardiomyopathy – doses as high as 5 mg/kg/dose 8 hourly may be used.
Route	Oral
Preparation/Dilution	
Administration	If using suspension compounded by Pharmacy, shake well before measuring dose. To reduce the risk of hypoglycaemia, administer orally during or immediately after a feed.
Monitoring	Heart rate and blood pressure for 2 hours after initiation or dose increases. Bradycardia: newborns (<1 month old) <70 beats per minute; infants (1–12 months old) <80 beats per minute. Blood glucose levels in premature infants and during intercurrent illness, especially in the setting of restricted oral intake.
Contraindications	Shock (cardiogenic and hypovolaemic). Bradycardia (45–50 beats/minute), second or third-degree AV block, sick sinus syndrome (without pacemaker), severe hypotension or uncontrolled heart failure.
Precautions	Consider discontinuing propranolol during intercurrent illness, especially in the setting of restricted oral intake, to prevent hypoglycaemia. Hyperthyroidism — beta-blockers may mask clinical signs, e.g. tachycardia. Phaeochromocytomas — beta-blockers may aggravate hypertension; an alpha-blocker should be given first.

	Beta-blockers may reduce the response to usual doses of adrenaline (epinephrine) for anaphylaxis. Myasthenia symptoms — may worsen. Beta-blockers may worsen first-degree AV block. Beta-blockers may impair peripheral circulation and exacerbate symptoms of peripheral arterial disease (PAD). Beta-blockers may mask important signs of acute hypoglycaemia (e.g. tachycardia, tremor). They may also increase the incidence and severity of hypoglycaemia but data are conflicting. Can precipitate bronchospasm.
Drug Interactions	β-Blockers and cholinomimetics cause bradycardia, AV blocks and hypotension via their synergistic negative chronotropic effect. β-Blockers and non-dihydropyridine calcium channel blockers (diltiazem, verapamil) cause bradycardia, asystole, sinus arrest due to their additive effect on the heart. β-Blockers and digoxin cause bradycardia and AV block via their additive effect. β-Blockers and dronedarone cause bradycardia as both drugs slow heart rate and dronedarone can inhibit CYP2D6 metabolism of some β-blockers. β-Blockers and antipsychotic phenothiazines cause hypotension as they have an additive effect. β-Blockers and propafenone cause profound hypotension and cardiac arrest as they have a similar effect on the heart, propafenone can inhibit metabolism of some β-blockers through inhibition of CYP2D6. Some β-blockers and some SSRIs (citalopram, escitalopram) cause bradycardia, AV blocks and hypotension can occur with fluoxetine and paroxetine which are potent inhibitors of CYP2D6 and thus slow metabolism of some β-blockers. Increased blood levels/toxicity: Inhibitors of CYP2D6 including amiodarone, cimetidine (but not ranitidine), delavudin, fluoxetine, paroxetine, quinidine and ritonavir; and inhibitors of CYP1A2 including imipramine, cimetidine, ciprofloxacin, fluvoxamine, isoniazid, ritonavir, theophylline, zileuton, zolmitriptan and rizatriptan. Decreased blood levels/decreased efficacy: Inducers of hepatic drug metabolism including rifampin, ethanol, phenytoin and phenobarbital.
Adverse Reactions	May cause transient worsening of heart failure symptoms (e.g. in too fast up-titration). The manifestations of β-blocker overdose include bradycardia, atrioventricular (AV) blockade, hypotension, left ventricular failure and cardiogenic shock. Common (>1%) adverse reactions include bradycardia, hypotension, orthostatic hypotension, transient worsening of heart failure (when treatment starts), nausea, diarrhoea, bronchospasm, dyspnoea, cold extremities, exacerbation of Raynaud's phenomenon, fatigue, dizziness, abnormal vision, alteration of glucose and lipid metabolism.
Compatibility	
Incompatibility	
Stability	Auspman Oral Solution: 2-year shelf life. Refer to expiry on bottle. Hemangiol Oral Solution: Use within 2 months of opening. Compounded suspension from Pharmacy Department: Shelf life usually 30 days. Refer to expiry on bottle.
Storage	Do not freeze. Protect from light. Auspman Oral Solution: Store below 30°C. Hemangiol Oral Solution: Store below 30°C. Do not freeze. Protect from light. Compounded suspension from Pharmacy Department: Refrigerate or store according to instructions on bottle.
Special Comments	Initiation of treatment is recommended after stabilisation of heart failure symptoms. Avoid too fast up-titration.
Evidence summary	Refer to full version.
References	Refer to full version.

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