



MONOGRAPH

ISOPRENALINE

Scope (Staff):	Medical, Pharmacy, Nursing, Anaesthetic Technicians
Scope (Area):	Paediatric Critical Care, Theatre, Emergency Department

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [DISCLAIMER](#)

! HIGH RISK MEDICINE !

QUICKLINKS

Dosage/Dosage Adjustments	Administration	Compatibility	Monitoring
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DRUG CLASS

Isoprenaline is a beta-1 and beta-2 adrenergic agonist. It is a positive chronotrope and inotrope.

- Its actions include increasing cardiac output, increasing systolic blood pressure, decreasing diastolic blood pressure by lowering peripheral vascular resistance, increasing heart rate by increasing automaticity and AV node conduction and improving coronary blood flow.⁽¹⁾
- Isoprenaline is a [High Risk Medicine](#)

INDICATIONS AND RESTRICTIONS

- Severe bradycardia (which is unresponsive to atropine)^(1, 2)
- Heart block (short term, until pacing is available)^(1, 2)
- Treatment of Adams-Stokes syndrome^(1, 2)

CONTRAINDICATIONS

NOTE: *Contraindications are relative as isoprenaline can be life saving*

- Hypersensitivity to isoprenaline or any component of the formulation.⁽²⁾
- Patients with tachyarrhythmias.^(1, 2)

- Patients with tachycardia or heart block caused by digoxin toxicity.^(1, 2)
- Patients with ventricular arrhythmias requiring inotropic therapy.^(1, 2)
- Recent myocardial infarction.^(1, 2)
- Ischaemic heart disease.^(1, 2)
- Pheochromocytoma.^(1, 2)
- Simultaneous therapy with adrenaline (epinephrine) or digoxin – this may induce serious cardiac arrhythmias.^(1, 2)

PRECAUTIONS

- Correct hypovolaemia before using isoprenaline.^(1, 2)
- Cardiogenic shock – may detrimentally increase myocardial oxygen consumption.⁽²⁾
- Hyperthyroidism – may increase risk of tachycardia and arrhythmias.^(1, 2)
- Hypertension – monitor blood pressure closely.⁽²⁾
- Diabetes – isoprenaline increases insulin production, therefore, blood glucose should be monitored.⁽²⁾

FORMULATIONS

Listed below are products available at PCH, other formulations may be available, check with pharmacy if required:

- Isoprenaline 200 microgram/1 mL ampoule

NOTE: 200 microgram/1 mL = 1:5000

Imprest location: [Formulary One](#)

DOSAGE & DOSAGE ADJUSTMENTS

Neonates: [Refer to Neonatal Medication Protocols](#)

Continuous Intravenous/Intraosseous Infusion:

4 weeks to 18 years⁽¹⁻³⁾

- Initially: 0.05–0.5 microg/kg/minute. Titrate to clinical response, up to maximum rate of 2 microg/kg/min.⁽¹⁾ Higher doses may be required in patients who have received beta-blockers.^(2, 3)
- Dosage adjustment is not necessary in either renal or hepatic insufficiency.⁽⁴⁾
- Onset of action is immediate.
- Duration of effect is 10 to 15 minutes and half-life is 2 to 5 minutes.

- Consider reducing or discontinuing infusion if patient becomes tachycardic. Do not stop infusion suddenly, gradual dose reduction is recommended.⁽⁵⁾

RECONSTITUTION & ADMINISTRATION

Isoprenaline must only be administered in critical care areas where continuous monitoring is available.⁽²⁾

Continuous IV / Intraosseous Infusion⁽⁶⁾:

Administration through a Central Venous Access Device (CVAD) is preferred, however, in some circumstances it may be necessary to initially use a large peripheral vein. Stop the infusion if there are signs of extravasation and take appropriate and immediate action.^(1, 4, 5)

Patient's Weight	Concentration (in Glucose 5%)	Notes
10 kg or less	1 mg in 30 mL (33 microg/mL)	In a 3 kg patient, 0.1 microg/kg/min = 0.5 mL/hr
Above 10 kg	3 mg in 50 mL (60 microg/mL)	In a 20 kg patient, 0.1 microg/kg/min = 2 mL/hr

COMPATIBILITY (LIST IS NOT EXHAUSTIVE)

Compatible fluids:

Sodium chloride 0.9%, glucose 5%.⁽⁵⁾

Giving other drugs via Y-site may change the infusion rate of isoprenaline. A dedicated line is preferred.⁽⁵⁾

[Compatibilities of IV drugs](#) must be checked when two or more drugs are given concurrently.

MONITORING

- Continuous monitoring of blood pressure, heart rate, ECG.^(2, 4)
- Urine output, blood gases (acid/base balance, electrolytes).^(2, 4)
- Monitor for signs of 'Compartment Syndrome' in patients receiving isoprenaline by the intraosseous route as this is often caused by extravasation.⁽⁶⁾

ADVERSE EFFECTS

Extravasation of isoprenaline may cause local ischaemia and necrosis. Therefore, the insertion site should be monitored closely for signs of phlebitis and extravasation.⁽⁶⁾ Extravasation management is described [here](#).

Common: Palpitations, tachycardia, hypotension, flushing, headache, nervousness, restlessness, fine tremor.^(1, 2, 4)

Rare: Arrhythmias, angina, hypertension, nausea, dry mouth, insomnia, rash, itch, wheeze, allergic reactions.^(1, 2, 4)

STORAGE

Ampoules should be stored below 25°C.^(2, 4)

Protect undiluted solution from light during storage. Do not use if discoloured or if any particulate matter is seen.

INTERACTIONS

Isoprenaline may interact with other medications; consult PCH approved references (e.g. [Clinical Pharmacology](#)), a clinical pharmacist or PCH Medicines Information Service on extension 63546 for more information.

****Please note:** The information contained in this guideline is to assist with the preparation and administration of **Isoprenaline**. Any variations to the doses recommended should be clarified with the prescriber prior to administration**




Related external legislation, policies and guidelines

[Central Venous Access Devices \(CVAD\) and Midline Insertion and Management](#)
[Intraosseous access](#)

References

1. Australian Medicines Handbook. Adelaide, S. Aust.: Australian Medicines Handbook; 2024 [cited 2024 May 22]. Available from: <https://amhonline-amh-net-au.pklibresources.health.wa.gov.au/>.
2. MIMS Australia. MIMS online [full product information]. St Leonards, N.S.W: CMP Medica Australia.; 2024 [cited 2024 May 22].
3. Cardiovascular Writing Group. Therapeutic Guidelines. West Melbourne: Therapeutic Guidelines Ltd; 2024.
4. Clinical Pharmacology powered by ClinicalKey [Internet]. Elsevier. 2024 [cited 22/05/2024]. Available from: <http://www.clinicalpharmacology-ip.com.pklibresources.health.wa.gov.au/default.aspx>.
5. Symons K. Ermer J. (editors). Australian injectable drugs handbook. Collingwood: The Society of Hospital Pharmacists of Australia; 2024.
6. Perth Children's Hospital. Perth Children's Hospital Intraosseous Access 2024. Available from: <https://pch.health.wa.gov.au/For-health-professionals/Emergency-Department-Guidelines/Intraosseous-access>.

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