Isoprenaline

APPLICABLE AREAS

THIS SECTION WILL BE LEFT BLANK FOR EACH HOSPITAL TO COMPLETE IN ACCORDANCE WITH LOCAL PRACTICE. EXAMPLES: ICU, ED, OR, WARD 2B

MECHANISM OF ACTION/PHARMACOLOGY

Isoprenaline is a non-selective β-adrenergic agonist.[1,2] It has positive inotropic and chronotropic effects, increasing cardiac output by increasing the heart rate and cardiac contractility.[1,2] Isoprenaline also decreases diastolic blood pressure by lowering peripheral vascular resistance.[1,2]

Onset of action: Immediate.[3]

Duration of action (IV): 10–15 minutes.[3]

Half-life: 2.5–5 minutes.[3]

INDICATIONS

Heart block.[2]

Bradycardia with haemodynamic compromise.[2]

PRECAUTIONS

- Hypersensitivity to isoprenaline or any of the excipients[4]
- Hypotension due to uncorrected hypovolaemia[2,4]
- Tachyarrhythmias[4]
- Recent myocardial infarction – may increase myocardial oxygen demand[2,4]
- Angina – may exacerbate[2]
- Heart block due to digoxin toxicity[4]
- Phaeochromocytoma.[2]

MEDICATION PRESENTATION

1 mg/5mL ampoule (1:5000)

Also available as 200 microg/1mL ampoule (1:5000); however, due to the number of vials that would be required, this concentration is not usually used to prepare infusions.

MEDICATION STORAGE

Store ampoules below 25°C. Protect from light.[5]

Infusion solutions are stable for up to 24 hours.[6]

PREPARATION

	Infusion pump	Syringe driver
Prescribe	6 mg in 100 mL	3 mg in 50 mL
Make up infusion in	100 mL bag of glucose 5%*	Glucose 5%* (to a total of 50 mL in the syringe)
Volume to be removed from IV bag	30 mL	Not applicable Draw up 35 mL in the syringe
Drug dose to be added	6 mg (30 mL)	3 mg (15 mL)
Final volume	100 mL	50 mL
Final concentration	60 microg/mL	60 microg/mL
1mL/hr =	1 microg/min	1 microg/min

*Glucose 5% is preferred for diluting all inotropes and vasopressors. However, isoprenaline is also compatible with sodium chloride 0.9%.[5]

ADMINISTRATION – THIS GUIDELINE IS INTENDED FOR CENTRAL ACCESS ONLY

Administer continuous intravenous infusion through a central access line.

Infusions should be administered via a syringe driver or infusion pump, preferably with medication error reduction software enabled.

Avoid administration in lines where other drugs or fluids may be bolused or flushed.

DOSING

Starting dose: 0.5 to 2 microg/min.

Titrate in accordance with prescribed parameters – for example, by increments of 0.5 to 1 microg/min.

Usual dose range: 2 to 10 microg/min.[3]

Maximum dose: rates greater than 30microg/min have been used in advanced stages of shock.[4]

MONITORING

- Continuous blood pressure and cardiac monitoring for the duration of the infusion[5]
- Daily 12-lead ECG
- Monitor fluid balance and electrolytes at least daily, especially magnesium and potassium.

SIDE EFFECTS

- Tachycardia[2]
- Hypotension[2]

- Arrhythmias[2]
- Angina.[2]

COMPATIBILITIES

Consult the following references, which are available online through the Clinicians Health Channel:

- Australian injectable drugs handbook
- Trissel's™ in IV compatibility (Micromedex) – from the site homepage, select the 'IV Compatibility' tab.

IMPORTANT DRUG INTERACTIONS

- Combined use with other medications with **beta-agonist effects (e.g. adrenaline)** may increase the risk of arrhythmias.[4]
- **β-antagonists** may decrease the efficacy of isoprenaline.[2]
- **Entacapone** is a catechol-O-methyltransferase (COMT) inhibitor, which may inhibit the metabolism of isoprenaline, increasing the risk of side effects. Dose isoprenaline conservatively.[2,7]
- **Theophylline** may potentiate hypokalaemia induced by isoprenaline, monitor potassium. Isoprenaline may also decrease theophylline concentration and consequently clinical effect. Monitor theophylline concentration and adjust accordingly.[2]

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