South Australian Neonatal Medication Guidelines

Isoprenaline

200microgram/mL injection (SAS)

Note:

This guideline provides advice of a general nature. This statewide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this statewide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected to review specific details of each patient and professionally assess the applicability of the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient's medical record, the decision made, by whom, and detailed reasons for the departure from the guideline.

This statewide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for discussing care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes:

- The use of interpreter services where necessary,
- Advising consumers of their choice and ensuring informed consent is obtained,
- Providing care within scope of practice, meeting all legislative requirements and maintaining standards of professional conduct, and
- Documenting all care in accordance with mandatory and local requirements

Synonyms

Isoproterenol

Dose and Indications

Consult with cardiology prior to use

Symptomatic bradyarrhythmia or heart block

Intravenous infusion

0.05 to 1microgram/kg/min

Start at the lower dose range and titrate according to heart rate up to a maximum of 2microgram/kg/min

Higher doses may be used in the management of beta blocker overdose. Contact Poisons Information Centre on 13 11 26 (24 hour service)

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Preparation and Administration

Continuous Intravenous infusion

Administer via a central line only. Extravasation may cause local ischaemia and necrosis

Select the strength required based on the weight of the infant in the context of any fluid restrictions. Maximum concentration for infusion is 64microgram/mL.

Isoprenaline Concentration Selection Tables can be found on the following pages of this guideline to assist prescribers to gauge which strength is best for the patient.

Dilute the appropriate volume of the 200microgram/mL isoprenaline solution using compatible fluid; and administer by continuous infusion. Diluted preparation is stable for 24 hours at room temperature. Discard any remaining solution.

The three standard concentrations to select from are:

- Isoprenaline 16microgram/mL
- Isoprenaline 32microgram/mL
- Isoprenaline 64microgram/mL

Formulae

To calculate infusion rate (mL/hr):

$$\text{Rate (mL/hr)} = \frac{60 \times \text{Dose (microgram/kg/min)} \times \text{Weight(kg)}}{\text{Strength(microgram/mL)}}$$

To calculate the dose (microgram/kg/min):

$$\text{Dose (microgram/kg/min)} = \frac{\text{Rate(mL/hr)} \times \text{Strength (microgram/mL)}}{60 \times \text{Weight (kg)}}$$

Isoprenaline Concentration Selection Tables

Isoprenaline 16microgram/mL

To make 25mL syringe:

Dilute 2mL isoprenaline (200microgram/mL) with 23mL of compatible fluid (total of 25mL).
The resulting solution contains 16microgram/mL isoprenaline

To make 50mL syringe:

Dilute 4mL isoprenaline (200microgram/mL) with 46mL of compatible fluid (total of 50mL).
The resulting solution contains 16microgram/mL isoprenaline

Table 1: Concentration selection table for isoprenaline 16microgram/mL

Recommended for neonates weighing <1kg

Rate (mL/hr)	0.2	0.4	0.6	0.8	1	Rate (mL/hr)
Weight (kg)	Approximate microgram/kg/minute					Weight (kg)
0.5	0.11	0.21	0.32	0.43	0.53	0.5
1	0.05	0.11	0.16	0.21	0.27	1
1.5		0.07	0.11	0.14	0.18	1.5
2		0.05	0.08	0.11	0.13	2
2.5		0.04	0.06	0.09	0.11	2.5
3			0.05	0.07	0.09	3
3.5			0.05	0.06	0.08	3.5
4			0.04	0.05	0.07	4

Isoprenaline 32microgram/mL

To make 25mL syringe:

Dilute 4mL isoprenaline (200microgram/mL) with 21mL of compatible fluid (total of 25mL).
The resulting solution contains 32microgram/mL isoprenaline

To make 50mL syringe:

Dilute 8mL isoprenaline (200microgram/mL) with 42mL of compatible fluid (total of 50mL).
The resulting solution contains 32microgram/mL

Table 2: Concentration selection table for isoprenaline 32microgram/mL

Generally used for neonates weighing 1kg to 3kg

Rate (mL/hr)	0.2	0.4	0.6	0.8	1	Rate (mL/hr)
Weight (kg)	Approximate microgram/kg/minute					Weight (kg)
0.5	0.21	0.43	0.64	0.85	1.07	0.5
1	0.11	0.21	0.32	0.43	0.53	1
1.5	0.07	0.14	0.21	0.28	0.36	1.5
2	0.05	0.11	0.16	0.21	0.27	2
2.5	0.04	0.09	0.13	0.17	0.21	2.5
3		0.07	0.11	0.14	0.18	3
3.5		0.06	0.09	0.12	0.15	3.5
4		0.05	0.08	0.11	0.13	4

Isoprenaline 64microgram/mL

To make 25mL syringe:

Dilute 8mL isoprenaline (200microgram/mL) with 17mL of compatible fluid (total of 25mL). The resulting solution contains 64microgram/mL isoprenaline

To make 50mL syringe:

Dilute 16mL isoprenaline (200microgram/mL) with 34mL of compatible fluid (total of 50mL). The resulting solution contains 64microgram/mL isoprenaline

Table 3: Concentration selection table for isoprenaline 64microgram/mL
Generally used for neonates >3kg

Rate (mL/hr)	0.2	0.4	0.6	0.8	1	Rate (mL/hr)
Weight (kg)	Approximate microgram/kg/minute					Weight (kg)
0.5	0.43	0.85	1.28	1.71	2.13	0.5
1	0.21	0.43	0.64	0.85	1.07	1
1.5	0.14	0.28	0.43	0.57	0.71	1.5
2	0.11	0.21	0.32	0.43	0.53	2
2.5	0.09	0.17	0.26	0.34	0.43	2.5
3	0.07	0.14	0.21	0.28	0.36	3
3.5	0.06	0.12	0.18	0.24	0.30	3.5
4	0.05	0.11	0.16	0.21	0.27	4

Compatible Fluids

Sodium chloride 0.9%, glucose 5%, glucose 10%

Adverse Effects

Common

Tachycardia, cardiac arrhythmias, tachycardia, hypotension, vomiting, fine tremor, flushing, restlessness

Infrequent

Arrhythmias, hypertension, angina, insomnia, rash, itch, hypoglycaemia

Monitoring

- Continuous heart rate, ECG and blood pressure
- Urine output and peripheral perfusion
- Electrolyte balance
- Blood glucose

Practice Points

- Contraindicated in patients with tachyarrhythmia; tachycardia or heart block due to digoxin toxicity; ventricular arrhythmias requiring inotropes; or coronary insufficiency
- Isoprenaline may increase systolic blood pressure. In hypertension, monitor closely and adjust dose if necessary
- Do not give simultaneously with adrenaline as their combined effects may induce serious arrhythmia

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