

South Australian Neonatal Medication Guidelines

adrenaline (epinephrine) (undiluted)

1mg/mL injection (1 in 1000)

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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

This is a High Risk Medication 

An overdose can be rapidly fatal.

There are two strengths of adrenaline (epinephrine) available. This guideline uses the undiluted 1mg/mL form and it requires diluting prior to intravenous infusion.

For information on adrenaline (epinephrine) for resuscitation, see adrenaline (epinephrine) (diluted) 0.1mg/mL for resuscitation

Synonyms

Epinephrine

Dose and Indications

Circulatory Support

Intravenous infusion

0.05 to 1microgram/kg/minute; commence at low dose and titrate based on clinical response

Infusion through a central line is preferable.



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Reactive Oedema Post-Extubation

Inhaled via nebuliser

0.5mL/kg (maximum 0.5mL per dose, regardless of weight) of adrenaline (epinephrine) 1mg/mL diluted with 2mL of 0.9% sodium chloride

If there is an initial response but subsequent worsening, repeat same dose. If there is no response to the first dose and airway obstruction is severe, re-intubate.

Preparation and Administration

Inhaled

Adrenaline (epinephrine) may be administered undiluted via nebuliser. If small volumes of adrenaline (epinephrine) 1mg/mL (1 in 1000) are required, dilute with 2mL of 0.9% sodium chloride prior to administration.

Intravenous Infusion

Select the strength required based on the weight of the infant in the context of any fluid restrictions. Adrenaline (epinephrine) 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 1mg/mL adrenaline (epinephrine) solution using compatible fluid; and administer by continuous infusion. Diluted preparation is stable for 24 hours at room temperature.

The three standard concentrations to select from are:

Adrenaline (epinephrine) 20microgram/mL (equivalent to 0.02mg/mL)

Adrenaline (epinephrine) 60micrograms/mL (equivalent to 0.06mg/mL)

Adrenaline (epinephrine) 180micrograms/mL (equivalent to 0.18mg/mL)

Formulae

To calculate infusion rate (mL/hr):

$$\text{Rate (mL/hr)} = \frac{60 \times \text{dose (micrograms/kg/min)} \times \text{weight(kg)}}{\text{Strength(microgram/mL)}}$$

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

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



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Adrenaline (epinephrine) Concentration Selection Table

Adrenaline (epinephrine) 20microgram/mL

To make 25mL syringe:

Dilute 0.5mL adrenaline (epinephrine) (1mg/mL) with 24.5mL of compatible fluid (total of 25mL). This makes a 20microgram/mL solution (0.02mg/mL).

To make 50mL syringe:

Dilute 1mL adrenaline (epinephrine) (1mg/mL) with 49mL of compatible fluid (total of 50mL). This makes a 20microgram/mL solution (0.02mg/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 | 0.13 | 0.27 | 0.40 | 0.53 | 0.67 | 0.5 |
| 1 | 0.07 | 0.13 | 0.20 | 0.27 | 0.33 | 1 |
| 1.5 | 0.04 | 0.09 | 0.13 | 0.18 | 0.22 | 1.5 |
| 2 | 0.03 | 0.07 | 0.1 | 0.13 | 0.17 | 2 |
| 2.5 | 0.03 | 0.05 | 0.08 | 0.11 | 0.13 | 2.5 |
| 3 | 0.02 | 0.04 | 0.07 | 0.09 | 0.11 | 3 |
| 3.5 | 0.02 | 0.04 | 0.06 | 0.08 | 0.1 | 3.5 |

Discard remaining solution.

Adrenaline (epinephrine) 60microgram/mL

To make 25mL syringe:

Dilute 1.5mL adrenaline (epinephrine) (1mg/mL) with 23.5mL of compatible fluid (total of 25mL). This makes a 60micrograms/mL solution (0.06mg/mL).

To make 50mL syringe:

Dilute 3mL adrenaline (epinephrine) (1mg/mL) with 47mL of compatible fluid (total of 50mL). This makes a 60micrograms/mL solution (0.06mg/mL).

Generally used for neonates weighing 1kg -3kg

| Rate (mL/hr) | 0.2 | 0.4 | 0.6 | 0.8 | 1 | Rate (mL/hr) |
|--------------|---------------------------------|-----|-----|-----|-----|--------------|
| Weight (kg) | Approximate microgram/kg/minute | | | | | Weight (kg) |
| 1 | 0.2 | 0.4 | 0.6 | 0.8 | 1 | 1 |
| 1.5 | 0.1 | 0.3 | 0.4 | 0.5 | 0.7 | 1.5 |
| 2 | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 2 |
| 2.5 | 0.1 | 0.2 | 0.2 | 0.3 | 0.4 | 2.5 |
| 3 | 0.1 | 0.1 | 0.2 | 0.3 | 0.3 | 3 |
| 3.5 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 3.5 |
| 4 | 0.1 | 0.1 | 0.2 | 0.2 | 0.3 | 4 |

Discard remaining solution.



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Adrenaline (epinephrine) 180microgram/mL

To make 25mL syringe:

Dilute 4.5mL adrenaline (epinephrine) (1mg/mL) with 20.5mL of compatible fluid (total of 25mL). This makes a 180micrograms/mL solution (0.18mg/mL).

To make 50mL syringe:

Dilute 9mL adrenaline (epinephrine) (1mg/mL) with 41mL of compatible fluid (total of 50mL). This makes an 180micrograms/mL solution (0.18mg/mL).

Generally for neonates weighing >3kg

| Rate (mL/hr) | 0.2 | 0.4 | 0.6 | 0.8 | 1 | Rate (mL/hr) |
|--------------|-------------------------------|-----|-----|-----|-----|--------------|
| Weight (kg) | Approximate micrograms/kg/min | | | | | Weight (kg) |
| 2 | 0.3 | 0.6 | 0.9 | 1.2 | 1.5 | 2 |
| 2.5 | 0.2 | 0.5 | 0.7 | 1 | 1.2 | 2.5 |
| 3 | 0.2 | 0.4 | 0.6 | 0.8 | 1 | 3 |
| 3.5 | 0.2 | 0.3 | 0.5 | 0.7 | 0.9 | 3.5 |
| 4 | 0.2 | 0.3 | 0.5 | 0.6 | 0.8 | 4 |
| 4.5 | 0.1 | 0.3 | 0.4 | 0.5 | 0.7 | 4.5 |
| 5 | 0.1 | 0.2 | 0.4 | 0.5 | 0.6 | 5 |

Discard remaining solution.



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Compatible Fluids

Glucose 5%, glucose 10%, sodium chloride 0.9%, glucose / sodium chloride combinations

Adverse Effects

Common

Tachycardia, tremor, sweating, hyperglycaemia

Infrequent

Peripheral ischaemia and necrosis at infusion site, excessive increase in blood pressure, ventricular arrhythmias, cerebral haemorrhage, renal vascular ischaemia, pulmonary oedema. These are mostly related to overdose or rapid IV administration.

Rare

Allergic reaction (sodium metabisulfite in preparations)

Monitoring

When administering by the intravenous route:

- > ECG monitoring and continuous medical supervision advised
- > Continuous heart rate
- > Intra-arterial blood pressure
- > Observe intravenous site for signs of extravasation

Practice Points

- > Caution - there are two strengths of adrenaline (epinephrine) available.
- > Adrenaline (epinephrine) may be of value in obvious stridor.
- > Adrenaline (epinephrine) is not a substitute for intubation, if intubation indicated.
- > Provide adequate hydration and correct underlying hypovolaemia.
- > Correct acidosis prior to administration to enhance effectiveness.
- > Adrenaline (epinephrine) is sensitive to light and air. Protection from light is recommended.



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Document Ownership & History

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|-------------------------|---|
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