

South Australian Neonatal Medication Guidelines

adrenaline (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 available. This guideline uses the undiluted 1mg/mL form and it requires diluting prior to intravenous infusion.

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

Synonyms

Epinephrine

Dose and Indications

Circulatory Support

Intravenous infusion

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

Infusion through a central line is preferable

ISBN number:
Endorsed by:
Last Revised:
Contact:

978-1-74243-375-2
South Australian Maternal & Neonatal Clinical Network
06/11/2012
South Australian Neonatal Medication Guidelines Workgroup at:
NeoMed@health.sa.gov.au

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Reactive Oedema Post-Extubation**Inhaled via nebuliser**

Gestational Age (Weeks)	Dose (mL of 1mg/mL strength)
< 36	2mL of adrenaline 1mg/mL diluted with 2mL of 0.9% sodium chloride, regardless of weight
≥36	4mL of adrenaline 1mg/mL, regardless of weight.

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 reintubate.

Preparation and Administration**Inhaled**

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

Intravenous Infusion

Select the strength required based on the weight of the infant in the context of any fluid restrictions. Adrenaline 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 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 20microgram/mL (equivalent to 0.02mg/mL)
- > Adrenaline 60micrograms/mL (equivalent to 0.06mg/mL)
- > Adrenaline 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 Concentration Selection Table for 25mL syringes**Adrenaline 20microgram/mL**

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

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 60microgram/mL

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

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

Adrenaline 180microgram/mL

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

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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Adrenaline Concentration Selection Table for **50mL** syringes

Adrenaline 20microgram/mL

Dilute 1mL adrenaline (1mg/mL) with 49mL of compatible fluid (total of 50mL). This makes a 20microgram/mL solution (0.02mg/mL).

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 60microgram/mL

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

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

Adrenaline 180microgram/mL

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

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 and hyperglycaemia.

Infrequent

Peripheral ischaemia and necrosis at infusion site, excessive increase in blood pressure, ventricular arrhythmias, cerebral haemorrhage, renal vascular ischaemia and 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 available
- > Adrenaline may be of value in obvious stridor
- > Adrenaline 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 is sensitive to light and air. Protection from light is recommended.

Version control and change history

PDS reference: OCE use only

Version	Date from	Date to	Amendment
1.0	November 2012	current	Original version

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