South Australian Neonatal Medication Guidelines

DOPamine

200mg/5mL injection

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.

Dose and Indications

Circulatory Support

Hypotension

Severe sepsis and septic shock

Intravenous infusion

3 to 20microgram/kg/minute; commence at low dose* and titrate dose every 5-10 minutes if required according to clinical response.

**Initial rate should be based on clinical context*

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Preparation and Administration

Intravenous Infusion

Administer preferably via a central line but may be used peripherally in an emergency when central access is not available.

Select the strength required based on the weight of the infant in the context of any fluid restrictions. DOPamine 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 DOPamine injection 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:

- DOPamine 800microgram/mL (0.8mg/mL)
- DOPamine 1600microgram/mL (1.6mg/mL)
- DOPamine 3200microgram/mL(3.2mg/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):

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

Dilution for DOPamine 800microgram/mL

To make 25mL syringe:

Dilute 0.5mL DOPamine (40mg/mL) with 24.5mL of compatible fluid (total of 25mL). The resulting solution contains 800microgram/mL DOPamine.

To make 50mL syringe:

Dilute 1mL DOPamine (40mg/mL) with 49mL of compatible fluid (total of 50mL). The resulting solution contains 800microgram/mL DOPamine.

Table 1: Concentration selection table for DOPamine 800microgram/mL

Recommended for neonates weighing <1kg

Rate (mL/hr)	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	Rate (mL/hr)
Weight (kg)	Approximate microgram/kg/minute									Weight (kg)
0.5	5	8	11	13	16	19	21	24	27	0.5
1	3	4	5	7	8	9	11	12	13	1
1.5	2	3	4	4	5	6	7	8	9	1.5
2	1	2	3	3	4	5	5	6	7	2
2.5	1	2	2	3	3	4	4	5	5	2.5
3	1	1	2	2	3	3	4	4	4	3
3.5	1	1	2	2	2	3	3	3	4	3.5

Dilution for DOPamine 1600microgram/mL

To make 25mL syringe:

Dilute 1mL DOPamine (40mg/mL) with 24mL of compatible fluid (total of 25mL). The resulting solution contains 1600microgram/mL DOPamine.

To make 50mL syringe:

Dilute 2mL DOPamine (40mg/mL) with 48mL of compatible fluid (total of 50mL). The resulting solution contains 1600microgram/mL DOPamine.

Table 2: Concentration selection table for DOPamine 1600microgram/mL

Generally used for neonates weighing 1kg to 3kg

Rate (mL/hr)	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	Rate (mL/hr)
Weight (kg)	Approximate microgram/kg/minute									Weight (kg)
1	5	8	11	13	16	19	21	24	27	1
1.5	4	5	7	9	11	12	14	16	18	1.5
2	3	4	5	7	8	9	11	12	13	2
2.5	2	3	4	5	6	7	9	10	11	2.5
3	2	3	4	4	5	6	7	8	9	3
3.5	2	2	3	4	5	5	6	7	8	3.5
4	1	2	3	3	4	5	5	6	7	4

Dilution for DOPamine 3200microgram/mL

To make 25mL syringe:

Dilute 2mL DOPamine (40mg/mL) with 23mL of compatible fluid (total of 25mL). The resulting solution contains 3200microgram/mL DOPamine.

To make 50mL syringe:

Dilute 4mL DOPamine (40mg/mL) with 46mL of compatible fluid (total of 50mL). The resulting solution contains 3200microgram/mL DOPamine.

Table 3: Concentration selection table for DOPamine 3200microgram/mL

Generally used for neonates weighing >3kg

Rate (mL/hr)	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1	Rate (mL/hr)
Weight (kg)	Approximate microgram/kg/minute									Weight (kg)
2	5	8	11	13	16	19	21	24	27	2
2.5	4	6	9	11	13	15	17	19	21	2.5
3	4	5	7	9	11	12	14	16	18	3
3.5	3	5	6	8	9	11	12	14	15	3.5
4	3	4	5	7	8	9	11	12	13	4
4.5	2	4	5	6	7	8	9	11	12	4.5
5	2	3	4	5	6	7	9	10	11	5

Compatible Fluids

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

Adverse Effects

Common

Tachycardia, hypotension or hypertension

Infrequent

Arrhythmia, bradycardia, mydriasis, vasocontriction, extravasation (may cause necrosis and sloughing of surrounding tissue)

Rare

Allergic reaction (due to sodium metabisulfite)

Monitoring

- Observe intravenous site for inflammation, extravasation and extreme vasoconstriction (tracking)
- Continuous heart rate
- Invasive blood pressure monitoring is recommended

Practice Points

- Correct hypovolaemia and acidosis prior to administration
- Doses >10microgram/kg/min can cause an increase in systemic resistance, fall in gastrointestinal blood flow and reduction in cardiac output especially in the first week of life
- DOPamine is incompatible with alkaline solutions such as sodium bicarbonate
- Phenytoin when given together with DOPamine may cause severe hypotension
- Do not bolus other drugs via DOPamine infusion
- Caution when changing IV line, avoid bolus or prolonged interruption of drug infusion
- Y-site compatible with parenteral nutrition where dopamine concentration is 3200microg/mL or weaker.
- Avoid co-infusion of dopamine with SMOFlipid®. However, if no alternative option, co infuse with caution, and only with dopamine concentrations less than or equal to 1600microgram/mL. There is conflicting data on the Y-site compatibility of intravenous lipids and dopamine. Y-site compatibility has been reported with parenteral nutrition solutions containing Intralipid® and dopamine infusions, however studies using dopamine concentrations greater than 1600microgram/mL has shown physical incompatibility. There is no evidence to guide practice with SMOFlipid®. Additionally, co-infusion of PN or fat emulsions with inotropic agents can result in pulsatile flow of inotropic agents.
- Use cautiously in patients with heart disease, or persistent pulmonary hypertension
- DOPamine causes reversible suppression of serum TSH, T4 and prolactin levels in very low birth weight infants. Caution with long-term use.
- Contraindicated in ventricular fibrillation or other uncorrected tachyarrhythmias and phaechromocytoma

References

> Filippi L, Pezzati M, Poggi C, Rossi S, Cecchi A, Santoro C, 2007, Dopamine versus dobutamine in very low birthweight infants: endocrine effects, Arch Dis Child Fetal Neonatal Ed, vol 92, pp 367–371.

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