South Australian Neonatal Medication Guidelines

Furosemide(frusemide)

10mg/mL injection, 10mg/mL oral suspension

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

Dose and Indications

Diuretic

Oral

1 to 2mg/kg/dose

Corrected Age (weeks) [Gestational age PLUS postnatal age]	Frequency (hours)
<29	Every 24 hours
≥29	Every 12 to 24 hours

Higher doses may be used for renal failure under specialist supervision

Intravenous injection

1mg/kg/dose

Corrected Age (weeks) [Gestational age PLUS postnatal age]	Frequency (hours)
<29	Every 24 hours
≥29	Every 12 to 24 hours

Higher doses may be used for renal failure under specialist supervision

Continuous intravenous infusion

Initial rate 0.1 mg/kg/hour

Double the dose every 2 hours (to a maximum of 0.4mg/kg/hour) if the urine output is less than 1mL/kg/hour.

Strict monitoring of fluid input and urine output is mandatory.

Preparation and Administration

Intravenous injection

Dose	1mg	2.5mg	5mg	7.5mg	10mg
Volume	0.1mL	0.25mL	0.5mL	0.75mL	1mL

Administer undiluted over 15 to 30 minutes. Rate should not exceed 0.5mg/kg/minute.

Discard remaining solution

Continuous intravenous infusion

Dilute 10mL of furosemide(frusemide) 10mg/mL injection with 40mL of sodium chloride 0.9% (final volume 50mL). This results in a 2mg/mL furosemide(frusemide) solution.

Do not use if discoloured. Discard solution after 24 hours.

Oral

Dose	1mg	2.5mg	5mg	7.5mg	10mg
Volume	0.1mL	0.25mL	0.5mL	0.75mL	1mL

May be administered without regards to feeds

Lasix® (furosemide(frusemide)) 10mg/mL oral solution contains 12.7%v/v ethanol. Concerns have been expressed in relation to its safety for use in premature infants and young children, particularly when chronic therapy is required. At Women's and Children's Hospital, a compounded formulation is available.

The intravenous preparation may be given orally and is more cost effective when giving a single dose or expected short term use

Furosemide(frusemide) tablets (20mg) can be used in halves and quarters (dispersed in water) if the dose can be rounded to these values.

Compatible Fluids

Sodium chloride 0.9%

Adverse Effects

Common

Electrolyte disturbances (hyponatraemia, hypokalaemia, hypomagnesaemia, hypocalcaemia, hypochloraemia), dehydration, hyperuricaemia, increased serum creatinine concentration

Nephrocalcinosis in preterm neonates

Infrequent

Dyslipidaemia, rash

Rare

Deafness (especially with rapid IV administration), acute pancreatitis, jaundice, thrombocytopenia, haemolytic anaemia, agranulocytosis, interstitial nephritis, exfoliative dermatitis, Stevens-Johnson syndrome, bullous eruptions

Supraventricular tachycardia with higher doses of furosemide(frusemide) continuous infusion

Monitoring

- Urine output
- Weight
- Serum electrolytes
- Acid/base balance
- Renal function

Practice Points

- The commercially available oral solution contains alcohol, thereby intravenous preparation is preferred to be given whilst inpatient. At discharge, parents should be counselled as to the options, which are to use the commercial preparation or to use the compounded product available from the WCHN. The risks of using the commercial preparation are unknown but considered to be very low
- Patients on long-term treatment with furosemide(frusemide) may require supplementation with oral potassium chloride to prevent hypokalaemia
- Do not use intravenous solution if discoloured yellow
- Risk of ototoxicity is increased with renal impairment, high doses, rapid IV administration and the use of other ototoxic drugs such as aminoglycosides
- Administration with other drugs with a hypotensive effect may cause an additional drop in blood pressure
- Precipitation can occur when mixed with any IV fluid such as glucose, with a pH less than 5.5. It should thereby be diluted with just 0.9% sodium chloride and always be separated by a 0.9% sodium chloride bolus
- Continuous infusion of furosemide(frusemide) compared to intermittent dosing has been reported to yield more controlled diuresis in infants post cardiac surgery

References

- Luciani G, et al, Continuous Versus Intermittent Furosemide Infusion in Critically Ill Infants After Open Heart Operations, 1997, The Society of Thoracic Surgeons, pp. 1133-1139
- Van der Vorst M.M., et al, Absence of tolerance and toxicity to high-dose continuous intravenous furosemide in haemodynamically unstable infants after cardiac surgery. British Journal of Clinical Pharmacology, 2007, pp796–803

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