BRIEF ADMINISTRATION GUIDE

For detailed information refer to The Australasian Neonatal Medicines Formulary **furosemide** guideline

Critical Note: there are minor variations between the ANMF and Waikato DHB best practice within this drug guideline – see yellow shaded text

Indications:
- Fluid overload, oedema
- Chronic lung disease

Route: Intravenous (Direct IV Injection and continuous IV infusion) or Oral
- Injection supplied as furosemide 20 mg/2 mL ampoule (concentration 10 mg/mL)
  - pH of furosemide 8 to 9.3
- Oral supplied as furosemide 10 mg/mL oral solution, or can use injection solution to avoid alcohol content (Note: commercial oral solution contains 12.7% ethanol)

Dose:

Intravenous Injection
- 1 mg/kg/dose (range 0.5 to maximum 2 mg/kg/dose)
  Dose interval according to table below:

Corrected Gestational Age	Interval
Preterm infant < 34 weeks	Every 24 hours
Preterm infant > 34 weeks	12 – 24 hours
Term infant 0-30 days	Every 12 hours
Term infant >30 days	8 – 12 hours

Continuous Intravenous Infusion
- 0.05 – 0.2 mg/kg/hour, adjusted according to urine output
  Maximum dose rate 1 mg/kg/h

Oral
- 0.5 – 2 mg/kg every 12 – 24 hours.
  Maximum 6 mg/kg/dose

Preparation and administration

Compatible fluids: sodium chloride 0.9% (preferred), glucose 5% and glucose 10%

Direct IV Injection
- Draw up dose of undiluted solution
- Give via a peripheral or central line slowly over 2 to 5 minutes (not exceeding rate of 0.5 mg/kg/min)

Continuous IV Infusion
- Select the concentration of furosemide required based on the weight of the infant and in the context of any fluid restrictions (refer to appendix 2 for assistance) and dilute the appropriate volume of furosemide injection using compatible fluid in accordance with the table below:

Final Furosemide Concentration	0.5 mg/mL	3 mg/mL
Volume of furosemide (20 mg / 2 mL)	2 mL	6 ml
Volume of compatible fluid	38 mL	14 mL
Total volume	40 mL	20 mL

- Administer at the prescribed rate by continuous IV infusion using a syringe driver with Guardrails settings (furosemide contin)

$$\text{Rate (mL/hr)} = \frac{\text{Dose (mg/kg/hr) x Weight (kg)}}{\text{Concentration (mg/mL)}}$$

Oral

- Draw up prescribed dose in an oral syringe
- Administer on an empty stomach if possible (but can administer with milk to reduce gastrointestinal distress)

Monitoring

- Serum electrolytes, renal function, blood pressure
- Fluid status (input and output and body weight)
- Observe for extravasation
- Hearing if prolonged or high dose treatment or co-administration with other ototoxic medication

Storage and Stability

- Discard any unused ampoule contents
- Diluted IV solutions are stable for up to 24 hours at 2 to 8 °C
- Prepare a fresh solution at least every 24 hours if using continuous IV
- Discard bottle of oral solution 8 weeks after opening

Competency for administration

This procedure is carried out by, or under, the direct supervision of a registered nurse/registered midwife who holds current Waikato DHB Generic Medicine Management and IV certification. For CVAD administration Neonatal specific competency NCV/NAC is also required.

Guardrails

Furosemide is not currently Guardrail profiled on the CC pump for NICU, however the continuous infusion will be added during the next upload. The limits will be:

Guardrails Drug Name	**Furosemide (contin)**
Concentration (mg/ml)	
Standard	0.5 and 3
Minimum	0.4
Maximum	10
Dose rate (mg/kg/hr)	
Default	0.1
Soft minimum	0.05
Soft maximum	0.4
Hard max	1

Associated Documents

- Audiology testing

References

- Australasian Neonatal Medicines Formulary. Furosemide 2021. Available from www.anmfonline.org
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Appendix

Infusion tables

Table 1: Infusion rates when using furosemide concentration **0.5 mg/mL**
(most useful for neonates ≤ 3 kg)

Rate (mL/hr)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Weight (kg)	**Approximate mg/kg/hour**									
0.5	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
1	0.05	0.1	0.15	0.2	0.25	0.30	0.35	0.40	0.45	0.5
1.5	0.03	0.07	0.1	0.13	0.17	0.2	0.23	0.27	0.3	0.33
2	0.03	0.05	0.08	0.1	0.13	0.15	0.18	0.2	0.23	0.25
2.5	0.02	0.04	0.06	0.08	0.1	0.12	0.14	0.16	0.18	0.2
3	0.02	0.03	0.05	0.07	0.08	0.1	0.12	0.13	0.15	0.17
3.5	0.01	0.03	0.04	0.06	0.07	0.09	0.1	0.11	0.13	0.14
4	0.01	0.03	0.04	0.05	0.06	0.08	0.09	0.1	0.11	0.13
4.5	0.01	0.02	0.03	0.04	0.06	0.07	0.08	0.09	0.1	0.11
5	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1

Table 2: Infusion rates when using furosemide concentration **3 mg/mL**
(most useful for neonates > 3 kg)

Rate (mL/hr)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Weight (kg)	**Approximate mg/kg/hour**									
2	0.15	0.3	0.5	0.6	0.75	0.9	1.05	1.2	1.35	1.5
2.5	0.12	0.24	0.36	0.48	0.6	0.72	0.84	0.96	1.08	1.2
3	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
3.5	0.09	0.17	0.26	0.34	0.43	0.51	0.6	0.69	0.77	0.86
4	0.08	0.15	0.23	0.3	0.38	0.45	0.53	0.6	0.68	0.75
4.5	0.07	0.13	0.2	0.27	0.33	0.4	0.47	0.53	0.6	0.67
5	0.06	0.12	0.18	0.24	0.3	0.36	0.42	0.48	0.54	0.6