

Milrinone for neonates

BRIEF ADMINISTRATION GUIDE

For detailed information refer to [The Australasian Neonatal Medicines Formulary \(ANMF\) milrinone guideline](#)



Note: Shaded text indicates where Health NZ Waikato practice differs from ANMF

1. Medicine

1.1. Indications

- Refractory pulmonary hypertension
- Low cardiac output
- Post PDA ligation syndrome

Note: consult with SMO if considering milrinone use

1.2. Route and Presentation

Intravenous

- Supplied as milrinone lactate 10mg in 10mL ampoule
 - pH 3.2 - 4

1.3. Dose

Preterm infant: 0.2 microgram/kg/minute. Be cautious when increasing the dose due to the risk of hypotension.

Term infant: 0.33 – 0.75 microgram/kg/minute

- A loading dose is not recommended in preterm neonates and should be used with caution in term neonates due to the risk of hypotension
- Reduce dose in renal dysfunction (initiate according to degree of dysfunction and individualise titration based on haemodynamic parameters and clinical response – discuss with SMO) to prevent medicine accumulation (half-life significantly increased)

2. Preparation and Administration

2.1. Compatible fluids

Sodium chloride 0.9%, sodium chloride 0.45%, glucose 5%, glucose 10% (untested)

2.2. Administration Method

Continuous IV Infusion

- Select the **standard concentration** of milrinone required based on the weight of the infant and in the context of any fluid restrictions, and prepare as per the table below:

Final Milrinone Concentration	50 microgram/mL	200 microgram/mL
Volume of milrinone (1 mg/mL)	2.5 mL	6 mL
Volume of compatible fluid	47.5 mL	24 mL
Total volume	50 mL	30 mL

- Administer by continuous intravenous infusion via a syringe driver, preferably via a central line

Note: Taper the infusion slowly when discontinuing treatment

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

2.3. Monitoring

- Continuous cardiac monitoring
- Blood pressure, heart rate
- Fluid balance and electrolytes
- Renal function

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2.4. Storage and Stability

- Diluted solution can be stored at room temperature for 24 hours

2.5. Competency for Administration

This procedure is carried out by, or under, the direct supervision of a registered nurse/registered midwife who holds current Health NZ Waikato Generic IV / Medicine Administration skills verification plus Guardrails competency (if administering IV) as well as Neonatal specific competency NCV/NAC (if administering via CVAD).

2.6. Guardrails

Milrinone is not currently Guardrail profiled on the CC syringe driver for NICU, but will be included at the next upload. Infusions will need to be run as “mL/hr” until milrinone is added (see calculation in section 2.2).

3. References

- Australian Neonatal Medicines Formulary. Milrinone Drug Guideline. 2021. Available from: www.anmfonline.org/wp-content/uploads/2021/06/milrinone-18022021-3.0.pdf
- New Zealand Formulary for Children (NZFC), version 141, 2024. Milrinone Available from: https://www.nzfchildren.org.nz/nzfc_993
- King Edward Memorial Hospital & Perth Children’s Hospital Neonatal Milrinone guideline. www.kemh.health.wa.gov.au/~media/HSPs/NMHS/Hospitals/WNHS/Documents/Clinical-guidelines/Neonatal-MPs/Milrinone.pdf
- Phelps SJ, Hagemann TM, Lee KR, Thompson AJ. The Teddy Bear Book: Pediatric Injectable Drugs. 11th edition. American Society of Health-System Pharmacists; 2018.
- Canterbury DHB Neonatal Services Milrinone Drug Information Sheet. June 2022. Available from: <https://edu.cdhb.health.nz/Hospitals-Services/Health-Professionals/Neonatal-Clinical-Resources/Neonatal-Drug-Information-Sheets/Documents/Milrinone.pdf>
- Notes on Injectable Drugs. NZ Hospital Pharmacists’ Association. Accessed via www.noids.nz/wp-content/uploads/2020/11/Milrinone-S.pdf
- Australian Injectable Drugs Handbook 9th edition, 2023. Society of Hospital Pharmacists of Australia.

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Appendix A - Infusion tables to assist concentration selection

Table 1: Infusion rates when using milrinone concentration 50 microgram/mL

(most useful for babies <2kg)

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 microgram/kg/min									
0.5	0.17	0.33	0.5	0.67	0.83	1	1.17	1.33	1.5	1.67
1	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83
1.5	0.06	0.11	0.17	0.22	0.28	0.33	0.39	0.44	0.5	0.56
2	0.04	0.08	0.13	0.17	0.21	0.25	0.29	0.33	0.38	0.42
2.5	0.03	0.07	0.1	0.13	0.17	0.2	0.23	0.27	0.3	0.33
3	0.03	0.06	0.08	0.11	0.14	0.17	0.19	0.22	0.25	0.28

Table 2: Infusion rates when using milrinone concentration 200 microgram/mL

(most useful for babies >2kg)

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 microgram/kg/min									
1	0.33	0.67	1	1.33	1.67	2	2.33	2.67	3	3.33
1.5	0.22	0.44	0.67	0.89	1.11	1.33	1.56	1.78	2	2.22
2	0.17	0.33	0.5	0.67	0.83	1	1.17	1.33	1.5	1.67
2.5	0.13	0.27	0.4	0.53	0.67	0.8	0.93	1.07	1.2	1.33
3	0.11	0.22	0.33	0.44	0.56	0.67	0.78	0.89	1	1.11
3.5	0.10	0.19	0.29	0.38	0.48	0.57	0.67	0.76	0.86	0.95
4	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83
4.5	0.07	0.15	0.22	0.3	0.37	0.44	0.52	0.59	0.67	0.74
5	0.07	0.13	0.2	0.27	0.33	0.4	0.47	0.53	0.6	0.67