Waikato District Health Board	Type: **Drug Guideline**	Document reference: **2957**	Manual Classification: **Waikato DHB Drug guidelines**	
Title: **Alprostadil (Prostaglandin E1) for neonates**			Effective date: **20 October 2021**	
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			Document expiry date: **20 October 2024**	

BRIEF ADMINISTRATION GUIDE

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

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

Indications:
- To promote dilation of ductus arteriosus in infants with ductal dependant congenital heart disease
- Pulmonary hypertension

Route: Intravenous (continuous intravenous infusion via a large vein or Umbilical Artery Catheter (UAC); positioned near the ductus arteriosis)

- Supplied as alprostadil 0.5 mg/mL ampoule
  - pH of alprostadil is 5.5

Dose:
- Initially 5 nanogram/kg/minute (= 0.005 microgram/kg/minute)
- Adjust by 5 nanogram/kg/minute increments until therapeutic response. Usual dose range 5 to 50 nanogram/kg/minute
- Maximum rate 100 nanogram/kg/minute (= 0.1 microgram/kg/minute)
- After a therapeutic response has been obtained, reduce infusion rate to lowest possible dosage that maintains the desired response (weigh oxygenation versus adverse effects)
- In general, higher infusion rates do not produce greater therapeutic effects but increase the incidence of adverse effects

Preparation and administration

Compatible fluids: glucose 5%, glucose 10%, sodium chloride 0.9%

- Draw up 49.5 mL of compatible diluent in a 50 mL syringe.
  Note: draw up diluent first as undiluted alprostadil may turn hazy when in contact with plastic.
- Draw up 0.5 mL (250 microgram) from the alprostadil 0.5 mg/mL ampoule and add this to the 49.5 mL of compatible fluid. This gives a final concentration of **5 microgram/mL**

Note: In exceptional circumstances an alternative concentration may be required – in these instances use the NICU drug computer software

- Mix well by inverting the syringe several times.
- Administer by continuous infusion at the prescribed rate using a syringe driver with Guardrails settings

$$\text{Rate (mL/hr)} = \frac{\text{Dose (nanogram/kg/minute)} \times 60 \times \text{Weight (kg)}}{\text{Concentration (microgram/mL)} \times 1000}$$

Monitoring

- Continuous pulse oximetry, heart rate, ECG and blood pressure monitoring
- Closely monitor infant temperature
- Renal function, full blood count daily initially, then as clinically indicated

Storage and Stability

- Store unopened ampoules in the fridge (2-8°C), do not freeze
- Discard any unused portion of the injection solution from the ampoule
- If haziness occurs (when diluting alprostadil) discard solution
- Diluted solutions should be used within 24 hours

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 plus Guardrails competency as well as Neonatal specific competency NCV/NAC (if administering via CVAD).

Guardrails Information

Alprostadil is Guardrail profiled on the CC pump for NICU. Following are the guardrail limits:

Guardrails Drug Name	**Alprostadil**
Concentration (microgram/ml)	
Standard	5
Minimum	1.2
Maximum	20
Dose rate (nanogram/kg/min)	
Default	5
Soft minimum	5
Soft maximum	50
Hard max	100

References

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- Waikato DHB. Guardrails Database. 2018.

Note: **Printed copies are only valid on the day of printing – they are not controlled and may not be the current version in use. Please refer to the online version.**

Appendix

Infusion table: Infusion rates when using alprostadil concentration **5 microgram/mL**

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 nanogram/kg/minute**									
0.5	17	33	50	67	83	100	117	133	150	167
1	8.3	17	25	33	42	50	58	67	75	83
1.5	5.6	11	17	22	28	33	39	44	50	56
2	4.2	8	13	17	21	25	29	33	38	42
2.5	3.3	7	10	13	17	20	23	27	30	33
3	2.8	6	8	11	14	17	19	22	25	28
3.5	2.4	5	7	10	12	14	17	19	21	24
4	2.1	4	6	8	10	13	15	17	19	21
4.5	1.9	4	6	7	9	11	13	15	17	19
5	1.7	3	5	7	8	10	12	13	15	17