		Type: Drug Guideline	Document reference: 0559	Manual Classification: Waikato DHB Drug Guidelines
Title: Adrenaline for Neonates			Effective date: 20 April 2022	
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BRIEF ADMINISTRATION GUIDE

For detailed information refer to [The Australasian Neonatal Medicines Formulary guidelines: adrenaline IV infusion adrenaline IV bolus adrenaline intratracheal bolus adrenaline nebulised](#)



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

Indications:

- 1) Cardiac resuscitation
- 2) Refractory hypotension
- 3) Relief of upper airways obstruction

Route:

- Intravenous (bolus and infusion), preferably via UVC
- Intracardiac
- Intratracheal
- Nebulised
- **Buccal** (if other routes are unavailable i.e. last resort)
 - Supplied as: adrenaline 1 in 10,000 injection (0.1 mg/mL) 10 ml ampoule and adrenaline 1 in 1,000 injection (1 mg/mL) 1 mL ampoule

Dose:

- 1) **Cardiac Resuscitation**
IV push or intracardiac (over 30-60 seconds)
0.1– 0.3 mL/kg/dose of 1:10,000 concentration
Intratracheal
0.5-1 mL/kg/dose (0.05 to 0.1 mg/kg) of 1:10,000 concentration via ET tube.
Repeat dose every 3 to 5 minutes as necessary
- 2) **Refractory hypotension**
Continuous IV infusion
0.1 mcg/kg/minute up to a usual maximum of 1 mcg/kg/min via CVAD
- 3) **Relief of upper airways obstruction**
Nebulised (unlicensed indication, permitted under Section 25 of the Medicines Act)
0.1 mL/kg of **1:1,000** concentration (Note concentration)

Preparation and administration

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


Slow IV push, intracardiac and intratracheal

Draw up dose prescribed of 1;10,000 concentration and administer over 3 to 5 minutes.

Continuous IV infusion

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

Final Adrenaline Concentration	20 microgram/mL	100 microgram/mL	300 microgram/mL
Volume of adrenaline 1 in 1,000 (1 mg/mL)	1 mL	5 mL	9 mL
Volume of compatible fluid	49 mL	45 mL	21mL
Total volume for infusion	50 mL	50 mL	30 mL

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- Wrap tubing in tinfoil and cover syringe
- Administer via CVAD at prescribed rate

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

Nebulised

Draw up dose prescribed of **1:1,000** concentration and dilute up to 2 mL with sodium chloride 0.9%. Nebulise over at least 5 minutes (refer to [Administering nebuliser for infant on ventilator or CPAP in NICU](#))

Buccal

Draw up dose prescribed and administer in the mouth between the gum and cheek.

Monitoring

- Continuous blood pressure monitoring or 5 minute BP recordings
- Continuous cardiorespiratory monitoring
- Document vital signs hourly and PRN
- Assess need for endotracheal suctioning. Mucous plugs may become more difficult to dislodge
- Observe IV site for signs of infiltration

Storage and Stability

- Change solutions 8 hourly or more frequently if BP not maintained. Adrenaline in solution is decomposed by light and air and solutions that are pink or brown in colour or contain particles should not be used.
- Discard ampoule after opening.

Competency for Administration

Administration of nebulised adrenaline & continuous infusion ONLY:


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 **and** Neonatal specific certifications NCV/NAC and NIC2, as well as Guardrails competency.

Administration of, IV push, intracardiac and endotracheal adrenaline are all given during resuscitation with medical staff managing the administration: This is a medical staff only procedure and should be administered with a 22 gauge needle.

Guardrails Information

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

Guardrails Drug Name	Adrenaline
Concentration (microgram/mL)	
Minimum	20
Maximum	300
Dose rate (microgram/kg/min)	
Default	0.1
Soft minimum	0.05
Soft maximum	1.05
Hard max	2.6

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Associated Documents


- Waikato DHB procedure "[Administering nebuliser for infant on ventilator or CPAP in NICU](#)", reference 3277

References

- Australian Neonatal Medicines Formulary. Adrenaline Drug Guidelines, 2016 & 2017. Available from: <https://www.slhd.nsw.gov.au/rpa/neonatal/NeoMedPaperCopy.html>
- Douglas Pharmaceuticals Ltd. Ibiamox® Data Sheet. 11 April 2018. Available from <https://www.medsafe.govt.nz/profs/datasheet/i/ibiamoxinj.pdf>
- Truven Health Analytics Inc. Pediatrics and Neofax®. 2019. Adrenaline monograph. Accessed 25.3.2020. Available from: <http://www.micromedexolutions.com>
- New Zealand Formulary for Children (NZFC). Adrenaline. Accessed 25.3.2020. Available from https://nzfchildren.org.nz/nzf_1896
- Phelps SJ, Hagemann TM, Lee KR, Thompson AJ. The Teddy Bear Book: Pediatric Injectable Drugs. 11th edition. American Society of Health-System Pharmacists; 2018.
- The Royal Children's Hospital Melbourne. Paediatric Injectable Guidelines. Accessed 25.3.2020. Available from <https://piq.rch.org.au>.
- Auckland DHB New born Services. Adrenaline Drug Protocol. November 2011. Available from <http://www.adhb.govt.nz/newborn/DrugProtocols/AdrenalinePharmacology.htm>
- Canterbury DHB Neonatal Services. Adrenaline Drug Information Sheet. April 2017. Available from <https://cdhb.health.nz/wp-content/uploads/fa9afe80-adrenaline-236640.pdf>
- Waikato DHB. Guardrails Database. 2018.

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Appendix

Infusion tables to assist concentration selection

Table 1: Infusion rates when using adrenaline concentration **20 microgram/mL**
(most useful for neonates ≤ 1 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 micrograms/kg/minute									
0.5	0.07	0.13	0.2	0.27	0.33	0.4	0.47	0.53	0.6	0.67
1	0.03	0.07	0.1	0.13	0.17	0.2	0.23	0.27	0.3	0.33
1.5	0.02	0.04	0.07	0.09	0.11	0.13	0.16	0.18	0.20	0.22
2	0.02	0.03	0.05	0.07	0.08	0.1	0.12	0.13	0.15	0.17

Table 2: Infusion rates when using adrenaline concentration **100 microgram/mL**
(likely useful for neonates 1 – 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 micrograms/kg/minute									
0.5	0.33	0.67	1	1.33	1.67	2	2.33	2.67	3	3.33
1	0.17	0.33	0.50	0.67	0.83	1	1.17	1.33	1.5	1.67
1.5	0.11	0.22	0.33	0.44	0.56	0.67	0.78	0.89	1	1.11
2	0.08	0.17	0.25	0.33	0.42	0.5	0.58	0.67	0.75	0.83
2.5	0.07	0.13	0.20	0.27	0.33	0.4	0.47	0.53	0.6	0.67
3	0.06	0.11	0.17	0.22	0.28	0.33	0.39	0.44	0.5	0.56
3.5	0.05	0.10	0.14	0.19	0.24	0.29	0.33	0.38	0.43	0.48
4	0.04	0.08	0.13	0.17	0.21	0.25	0.29	0.33	0.38	0.42
4.5	0.04	0.07	0.11	0.15	0.19	0.22	0.26	0.3	0.33	0.37
5	0.03	0.07	0.1	0.13	0.17	0.2	0.23	0.27	0.3	0.33

Table 3: Infusion rates when using adrenaline concentration **300 microgram/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 micrograms/kg/minute									
1	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5
1.5	0.33	0.67	1	1.33	1.67	2	2.33	2.67	3	3.33
2	0.25	0.50	0.75	1	1.25	1.5	1.75	2	2.25	2.5
2.5	0.2	0.4	0.6	0.8	1	1.2	1.4	1.6	1.8	2
3	0.17	0.33	0.5	0.67	0.83	1	1.17	1.33	1.5	1.67
3.5	0.14	0.29	0.43	0.57	0.71	0.86	1	1.14	1.29	1.43
4	0.13	0.25	0.38	0.5	0.63	0.75	0.88	1	1.13	1.25
4.5	0.11	0.22	0.33	0.44	0.56	0.67	0.78	0.89	1	1.11
5	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1