

**ADRENALINE****This drug must be guardrailed**

<b>Trade Name</b>	Adrenaline (generic)
<b>Class</b>	Sympathomimetic / vasopressor
<b>Mechanism of Action</b>	<p><math>\alpha</math> &amp; <math>\beta</math> receptor stimulation resulting in cardiac stimulation and relaxation of bronchial smooth muscle</p> <p>positive inotrope and chronotrope</p> <p>increased systemic vascular resistance at higher doses<sup>3</sup></p>
<b>Supplied As</b>	<p>1:10 000 = 100 microgram/mL = 1mg/10mL</p> <p>1:1 000 = 1000 microgram/mL = 1mg/mL</p>
<b>Indication 1:</b>  <b>Dosage</b>  <b>Dilution</b>  <b>Interval</b>  <b>Administration</b>	<p><b>Cardiopulmonary resuscitation:</b> (heart rate &lt; 80/min despite adequate respiratory support)</p> <p>ETT: 1:10000, 1mL/kg</p> <p>UVC: 1:10000, 0.1mL/kg, then 0.3mL/kg, then repeat 0.3mL/kg, then 1mL/kg</p> <p>Nil needed but can be diluted with saline to assist administration if the dose is tiny</p> <p>Repeat every 3-5 mins if no response to previous dose.</p> <p>IV bolus is the ideal route</p> <p>If no IV access: first 2 doses may be given down the ETT; but the 3<sup>rd</sup> dose should be IV, preferably via a UVC</p> <p>Intraosseous route may be used (flush with saline).</p>
<b>Indication 2:</b>  <b>Dosage</b>  <b>Guardrail</b> <b>*Must chart guardrail and use Alaris pump*</b>  <b>Dilution</b>	<p><b>Cardiac Support:</b></p> <p><b>Inotropic dosing</b> 0.05 - 0.1 microgram/kg/min</p> <p><b>Hypotension dosing</b> 0.2 - 1.0 microgram/kg/min</p> <p>Conc Min - 0.9 microgram/mL    Conc Max - 60 microgram/mL</p> <p>Soft Min: 0.02 microgram/kg/min    Hard Max: 1.0 microgram/kg/min</p> <p>Soft Max: 0.6 microgram/kg/min    Default: 0.05 microgram/kg/min</p> <p><b>Print off a separate adrenaline infusion sheet for charting</b></p> <p><b>Single Strength:</b> Take 6mL/kg (600 microgram/kg) of 1:10000 adrenaline, make up to 50mL with 5% dextrose or 0.9S</p> <p><b>0.1 microgram/kg/min = 0.5mL/hr</b></p> <p><b>Double Strength:</b> Take 12 mL/kg (1200 microgram/kg) of 1:10000 adrenaline, make up to 50mL with 5% dextrose only</p> <p><b>0.1 microgram/kg/min = 0.25mL/hr</b></p> <p>If &gt;2.5kg will exceed maximum concentration and will need to use single strength solution</p> <p><b>Interval/Administration</b> Continuous IV infusion. Central line preferred but can be infused peripherally with close observation in critical situations</p>

<b>Indication 3:</b>	<b>Acute anaphylaxis:</b>
<b>Dosage</b>	1:10000, 0.1 mL/kg iv 1:1000, 0.01 mL/kg subcutaneous
<b>Dilution</b>	Nil
<b>Administration</b>	IV bolus or subcutaneous (Note:CDHB resus team restricts use to IM and nebulisation in adults)
<b>Indication 4:</b>	<b>Upper airway obstruction:<sup>4</sup></b>
<b>Dosage</b>	0.5 mL/kg of 1:1000 diluted to 2mL with normal saline
<b>Dilution</b>	Dilute to 2mL with normal saline
<b>Interval</b>	Effect lasts $\pm$ 40 minutes
<b>Administration</b>	Nebulised
<b>Indication 5:</b>	<b>Acute Pulmonary Haemorrhage</b>
<b>Dosage</b>	0.1-0.3mL/kg
<b>Dilution</b>	Nil needed but can be diluted with saline to assist administration if the dose is less than 0.5mL
<b>Administration</b>	ETT bolus and repeat every 3-5 mins until bleeding is controlled
<b>Contraindications</b>	Arrhythmias; tachycardia > 200 beats/min.
<b>Compatible with</b>	<b>Solutions:</b> 0.9% sodium chloride, 5% dextrose, dextrose saline, lactated Ringer's. <b>Y-site compatibility with:</b> amiodarone, amphotericin B liposomal, benzylpenicillin, caffeine citrate, calcium chloride, calcium gluconate, cefazolin, cefotaxime, ceftazidime, cefuroxime, dexamethasone, digoxin, dobutamine, dopamine, erythromycin, fluconazole, furosemide, gentamicin, heparin, hydrocortisone, imipenem + cilastin, midazolam, milrinone, morphine, naloxone, ondansetron, pancuronium, piperacillin and tazobactam, potassium chloride, propranolol, prostaglandin, ranitidine, vancomycin, vit K
<b>Incompatible with</b>	Aciclovir, aminophylline, ganciclovir, phenobarbitone, phenytoin, sodium bicarbonate, sulfamethoxazole and trimethoprim . No information on compatibility with TPN and Lipid.
<b>Monitoring</b>	Heart rate and BP.
<b>Stability</b>	Single-use ampoule (no preservative). Do not use solutions of adrenaline that are discoloured (pink or brown).
<b>Storage</b>	Room air < 25 degrees, protect from light.
<b>Adverse Reactions</b>	Local injection: ischaemia and necrosis. Systemic: arrhythmias; hypokalaemia; increased myocardial oxygen consumption; severe hypertension, intracranial haemorrhage; renal-vascular ischaemia; tremor.

<b>Metabolism</b>	Hepatic via COMT & MAO enzymes.																		
<b>Comments</b>	Overdose Treatment: phentolamine and propranolol Correct hypovolaemia and acidosis prior to commencing infusion.																		
<b>References</b>	<ol style="list-style-type: none"> <li>1. Shann F. "Drug Doses" Handbook 1998: Tenth Edition.</li> <li>2. "Neonatal Pharmacopoeia" Handbook 1998: 1<sup>st</sup> Edition.</li> <li>3. John Spence Nursery Drug Database web site <a href="http://www.cs.nsw.gov.au/rpa/neonatal/">http://www.cs.nsw.gov.au/rpa/neonatal/</a></li> <li>4. Gwinnutt C.L. et al. Letter in: Anaesthesia 1987 Mar; 42(3):320-1.</li> <li>5. Trissell Handbook of injectable Drugs 10th Edition.</li> <li>6. NZHPA Notes on injectable Drugs 5th Edition</li> <li>7. Neofax 2013.; Micromedex</li> <li>8. New Zealand Formulary <a href="http://www.nzf.org.nz">www.nzf.org.nz</a></li> </ol>																		
<b>Updated By</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">J Klimek, N Austin</td> <td>October 2001</td> </tr> <tr> <td>P Schmidt, B Robertshawe</td> <td>May 2005</td> </tr> <tr> <td>A Lynn, B Robertshawe</td> <td>September 2009, June 2012</td> </tr> <tr> <td>A Lynn</td> <td>May 2013 (drop soft min after audit)</td> </tr> <tr> <td>A Lynn</td> <td>Aug 2015 (increase soft max after audit)</td> </tr> <tr> <td>A Lynn B Robertshawe</td> <td>March 2017 (update compatibilities)</td> </tr> <tr> <td>A Lynn, M Wallenstein, B Robertshawe, A Evison</td> <td>May 2020</td> </tr> <tr> <td>A Lynn N Austin</td> <td>Sept 2022 (pulmonary haemorrhage)</td> </tr> <tr> <td>A Lynn</td> <td>Clarify dosing for inotrope vs hypotension Review conc. for continuous infusions</td> </tr> </table>	J Klimek, N Austin	October 2001	P Schmidt, B Robertshawe	May 2005	A Lynn, B Robertshawe	September 2009, June 2012	A Lynn	May 2013 (drop soft min after audit)	A Lynn	Aug 2015 (increase soft max after audit)	A Lynn B Robertshawe	March 2017 (update compatibilities)	A Lynn, M Wallenstein, B Robertshawe, A Evison	May 2020	A Lynn N Austin	Sept 2022 (pulmonary haemorrhage)	A Lynn	Clarify dosing for inotrope vs hypotension Review conc. for continuous infusions
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