Adrenaline (Epinephrine) IV Infusion - Standard Concentration | 2025

Newborn use only

Alert	1:10,000 (1 mg/10 mL) ampoule is the preferred preparation for adrenaline infusion.
Indication	Treatment of hypotensive shock with or without myocardial dysfunction.
Action	Catecholamine with alpha and beta adrenergic actions. Haemodynamic effects are dose dependent: • At low doses of 0.01–0.1 microgram/kg/minute primarily stimulates cardiac and vascular beta 1- and beta 2-adrenoreceptors leading to increased inotropy, chronotropy, conduction velocity and peripheral vasodilation. • At doses greater than 0.1 microgram/kg/minute adrenaline also stimulates vascular and cardiac alpha 1-receptors causing vasoconstriction and increased inotropy. The net effects are increases in blood pressure and systemic blood flow caused by the drug-induced increases in systemic vascular resistance (SVR) and cardiac output.[1]
Drug type	Inotropic vasopressor
Trade name	Aspen Adrenaline 1: 10,000 Adrenaline Acid Tartrate injection; Adrenaline 1:1,000 Adrenalin Acid Tartrate injection.
Presentation	1 mg/10 mL or 1:10,000 ampoule [100 microgram/mL] 1 mg/mL or 1:1,000 ampoule [1000 microgram/mL] 20 microgram/mL in glucose 5% or sodium chloride 0.9% - Premade 50mL syringe from Baxter
Dose	Low dose: 0.05–0.1 microgram/kg/minute High dose: 0.1–1 microgram/kg/minute
Route	Continuous IV infusion
Preparation	**Note: Refer to Appendix for tables to assist with concentration selection.** **Weight suggestions for infusion concentrations below are a guide only. Clinicians may choose infusion concentration different to the suggested based on expected dose and the corresponding 24-hour fluid volumes**

Infant weight	<1 kg or PERIPHERAL access	1 to <3 kg	≥ 3 kg	fluid restricted infants ≥ 3 kg
Suggested adrenaline concentration	**10 microgram/mL**	**20 microgram/mL**	**60 microgram/mL**	**100 microgram/mL**
0.05 microgram/kg/minute is equal to	0.3 mL/kg/hour	0.15 mL/kg/hour	0.05 mL/kg/hour	0.03 mL/kg/hour

ALWAYS USE 1:10,000 (1 mg/10 mL) ampoule

20 mL Syringe

Draw up adrenaline and add compatible fluid* as per table below to make a final volume of 20 mL

Adrenaline concentration	**10 microgram/mL**	**20 microgram/mL**	**60 microgram/mL**	**100 microgram/mL**
Volume of adrenaline (0.1 mg/mL)	2 mL (200 microg)	4 mL (400 microg)	12 mL (1200 microg)	20 mL (2000 microg)
Volume of compatible fluid*	18 mL	16 mL	8 mL	Nil
Total volume	20 mL	20 mL	20 mL	20 mL

* Compatible fluid: glucose 5%, glucose 10% or sodium chloride 0.9%

50 mL Syringe

Draw up adrenaline and add compatible fluid* as per table below to make a final volume of 50 mL

Adrenaline concentration	**10 microgram/mL**	**20 microgram/mL#**	**60 microgram/mL**	**100 microgram/mL**
Volume of adrenaline (0.1 mg/mL)	5 mL (500 microg)	10 mL (1000 microg)	30 mL (3000 microg)	50 mL (5000 microg)
Volume of compatible fluid*	45 mL	40 mL	20 mL	Nil
Total volume	50 mL	50 mL	50 mL	50 mL

* Compatible fluid: glucose 5%, glucose 10% or sodium chloride 0.9%

	[#] Baxter premade 50mL syringe containing 20 microgram/mL in glucose 5% or sodium chloride 0.9% is available.
Administration	Continuous IV infusion preferably via dedicated central line. Use with caution via a peripheral line.
Monitoring	Continuous heart rate, ECG and blood pressure monitoring preferable. Assess urine output and peripheral perfusion frequently. Observe IV site closely for blanching and extravasation.
Contraindications	Arrhythmia and tachyarrhythmia. Cardiovascular disease resulting in arterial narrowing including cerebrovascular disease, coronary artery disease and digital ischaemia. Phaeochromocytoma. Thyrotoxicosis. Glaucoma. Known hypersensitivity to sympathomimetic amines.
Precautions	Ensure adequate circulating blood volume prior to commencement. Potent chronotrope and vasopressor – may cause excessive tachycardia, severe hypertension and ventricular arrhythmias. May cause lactic acidosis and hyperglycaemia.
Drug interactions	Hypotension may be observed with concurrent use of vasodilators such as glyceryl trinitrate, nitroprusside and calcium channel blockers. Concurrent use of digitalis glycosides may increase the risk of cardiac arrhythmias. Concurrent use of IV phenytoin with adrenaline may result in dose dependent, sudden hypotension and bradycardia.
Adverse reactions	Tachycardia and arrhythmia. Systemic hypertension especially at higher doses. May cause hypokalaemia. Tissue necrosis at infusion site with extravasation. Digital ischaemia.
Overdose	AUSTRALIA Contact the Poisons Information Centre on **13 11 26** for information on the management of overdose. NEW ZEALAND Contact the National Poisons Centre on **0800 764 766** for information on the management of overdose.
Compatibility	**Fluids**: Glucose 5%, glucose 10%, glucose 5% in sodium chloride solutions, Hartmann's, sodium chloride 0.9%. Stability data only available for 5% glucose for very high concentration. **PN at Y-site:** Amino acid solutions.[10] No information on lipid emulsion. **Y-site**: Alprostadil, amikacin, amiodarone, anidulafungin, atracurium, atropine, azithromycin, bivalirudin, caffeine citrate, calcium chloride, calcium gluconate, caspofungin, cefaZOLin, cefOTAXIME, cefTAZIDIME, cisatracurium, clindamycin, dexamethasone sodium phosphate, dexMEDETOMIDine, dobutamine, dopamine, esmolol, fentanyl, flucONAZOLe, furosemide, glyceryl trinitrate, heparin sodium, hydrocortisone, magnesium sulfate, meropenem, milrinone, morphine sulfate, pancuronium, potassium chloride, ranitidine, remifentanil, sodium nitroprusside, tigecycline, tirofiban, vecuronium. **No information**: Adrenaline hydrochloride is compatible with noradrenaline bitartrate but no stability data is available for Adrenaline acid tartrate and noradrenaline bitartrate.
Incompatibility	**Fluids**: Sodium bicarbonate. **Y-site**: Aciclovir, aminophylline, ampicillin, azathioprine, calcium chloride, calcium gluconate, cefalotin, chloramphenicol, digoxin, ergometrine, ganciclovir, hyaluronidase, indomethacin, phenobarbitone sodium, sodium bicarbonate, thiopentone, vancomycin.
Stability	Diluted solution: Stable for 24 hours below 25°C.
Storage	Store below 25°C. Protect from light. Discard remainder after use.
Excipients	1:1000 solution: sodium metabisulfite, sodium chloride, water for injections and sodium hydroxide or hydrochloric acid. 1:10,000 solution: Tartaric acid, sodium metabisulfite, sodium chloride and water for injections.
Special comments	Preferably administered via "dedicated" line to avoid accidental bolus. Do not use as a sideline with maintenance fluids. Discard if exhibiting colour change.

Evidence	**Efficacy:** **Treatment of hypotension in preterm infants:** A single study of adrenaline 0.125−0.5 microgram/kg/minute versus dopamine 2.5−10 microgram/kg/minute reported they are equally effective at treating hypotension and increasing cerebral blood flow in very preterm infants. Adrenaline is associated with worse acid base status and increased hyperglycaemia. No difference in clinical outcomes was reported.[1−3] A single study of adrenaline 0.125, 0.250, 0.375, 0.5 microgram/kg/minute versus dopamine 5, 10, 15, 20 microgram/kg/minute reported dopamine reduced left ventricular output (LVO) 10% compared to a 14% increase in LVO with adrenaline. Dopamine and adrenaline caused significant increases in mean BP and pulmonary artery pressure. (LOE II, GOR C) **Infants and children with septic shock:** Early administration of adrenaline 0.1–0.3 microgram/kg/minute was associated with increased survival compared to dopamine.[4] (LOE II, GOR B) **Vasopressors for hypotensive shock (newborns excluded):** In treatment of hypotensive shock beyond the newborn period, there was no difference in mortality comparing adrenaline and other vasopressors (noradrenaline, noradrenaline and dobutamine, or noradrenaline and dopexamine).[5] (LOE I, GOR B) **Summary** Adrenaline may be used in hypotensive neonates with vasodilatory shock with or without myocardial dysfunction, particularly those with septic shock or unresponsive to other inotropes. (LOE II, GOR B) **Safety** Adrenaline may be associated with worse acid base status and increased hyperglycaemia.[3] Adrenaline is a potent vasoconstrictor.[6] **Pharmacokinetics** The onset of action is rapid and after intravenous infusion the half-life is approximately 5−10 minutes.[7] However, the half-life of intravenous adrenaline has not been reported in sick newborn infants. The plasma half-life of intratracheal adrenaline for newborn resuscitation is likely to average approximately 50 minutes.[8]
References	1. Pellicer A, Bravo MDC, Madero R, Salas S, Quero J, Cabañas F. Early systemic hypotension and vasopressor support in low birth weight infants: Impact on neurodevelopment. Pediatrics. 2009;123:1369-76. 2. Pellicer A, Valverde E, Elorza MD, Madero R, Gayá F, Quero J, Cabañas F. Cardiovascular support for low birth weight infants and cerebral hemodynamics: A randomized, blinded, clinical trial. Pediatrics. 2005;115:1501-12. 3. Valverde E, Pellicer A, Madero R, Elorza D, Quero J, Cabanas F. Dopamine versus epinephrine for cardiovascular support in low birth weight infants: analysis of systemic effects and neonatal clinical outcomes. Pediatrics. 2006;117:e1213-22. 4. Ventura AMC, Shieh HH, Bousso A, Góes PF, Fernandes IDCFO, De Souza DC, Paulo RLP, Chagas F, Gilio AE. Double-blind prospective randomized controlled trial of dopamine versus epinephrine as first-line vasoactive drugs in pediatric septic shock. Critical Care Medicine. 2015;43:2292-302. 5. Havel C, Arrich J, Losert H, Gamper G, Mullner M, Herkner H. Vasopressors for hypotensive shock. The Cochrane database of systematic reviews. 2011:CD003709. 6. Noori S, Seri I. Neonatal blood pressure support: the use of inotropes, lusitropes, and other vasopressor agents. Clinics in perinatology. 2012;39:221-38. 7. Fitzgerald GA, Barnes P, Hamilton CA, Dollery CT. Circulating adrenaline and blood pressure: the metabolic effects and kinetics of infused adrenaline in man. European journal of clinical investigation. 1980;10:401-6. 8. Schwab KO, von Stockhausen HB. Plasma catecholamines after endotracheal administration of adrenaline during postnatal resuscitation. Archives of disease in childhood Fetal and neonatal edition. 1994;70:F213-7. 9. Young TE, Mangum B [2008]. Neofax: A manual of drugs used in neonatal care. Acorn Publishing, Inc. Raleigh, NC 27619 10. MerativeTM Micromedex® Complete IV Compatibility (electronic version). Merative, Ann Arbor, Michigan, USA. Available at: https://www.micromedexsolutions.com/ (cited: Jan/19/2026).

Appendix

Infusion tables to assist with concentration selection

Table 1: Infusion rates when using adrenaline concentration **10 microgram/mL**
(suggested weight <1 kg OR PERIPHERAL access only)

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/minute									
0.5	0.03	0.07	0.1	0.13	0.17	0.2	0.23	0.27	0.3	0.33
1	0.02	0.03	0.05	0.07	0.08	0.1	0.12	0.13	0.15	0.17
1.5	0.01	0.02	0.03	0.04	0.06	0.07	0.08	0.09	0.1	0.11
2	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.07	0.08	0.08
2.5	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07
3	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05	0.06
3.5	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.04	0.04	0.05
4	0.00	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.04	0.04
4.5	0.00	0.01	0.01	0.01	0.02	0.02	0.03	0.03	0.03	0.04
5	0.00	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.03

Table 2: Infusion rates when using adrenaline concentration **20 microgram/mL**
(suggested weight 1 to <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 microgram/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	0.2	0.22
2	0.02	0.03	0.05	0.07	0.08	0.1	0.12	0.13	0.15	0.17
2.5	0.01	0.03	0.04	0.05	0.07	0.08	0.09	0.11	0.12	0.13
3	0.01	0.02	0.03	0.04	0.06	0.07	0.08	0.09	0.10	0.11
3.5	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1
4	0.01	0.02	0.03	0.03	0.04	0.05	0.06	0.07	0.08	0.08
4.5	0.01	0.01	0.02	0.03	0.04	0.04	0.05	0.06	0.07	0.07
5	0.01	0.01	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07

Table 3: Infusion rates when using adrenaline concentration **60 microgram/mL**
(suggested weight ≥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 microgram/kg/minute									
0.5	0.2	0.4	0.6	0.8	1	1.2	1.4	1.6	1.8	2
1	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
1.5	0.07	0.13	0.2	0.27	0.33	0.4	0.47	0.53	0.6	0.67
2	0.05	0.1	0.15	0.2	0.25	0.3	0.35	0.4	0.45	0.5
2.5	0.04	0.08	0.12	0.16	0.2	0.24	0.28	0.32	0.36	0.4
3	0.03	0.07	0.1	0.13	0.17	0.2	0.23	0.27	0.3	0.33
3.5	0.03	0.06	0.09	0.11	0.14	0.17	0.2	0.23	0.26	0.29
4	0.03	0.05	0.08	0.1	0.13	0.15	0.18	0.2	0.23	0.25
4.5	0.02	0.04	0.07	0.09	0.11	0.13	0.16	0.18	0.2	0.22
5	0.02	0.04	0.06	0.08	0.1	0.12	0.14	0.16	0.18	0.2

Table 4: Infusion rates when using adrenaline concentration **100 microgram/mL**
(suggested for fluid restricted infants ≥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 microgram/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	0.5	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	0.2	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	0.1	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

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

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

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