Adrenaline (epinephrine) intravenous bolus 2016

Alert	
Indication	Resuscitation of the newborn infant. If adequate ventilation and chest compressions have failed to increase the heart rate to > 60 beats per minute within about a minute, then adrenaline should be given intravenously as soon as possible.[1]
Action	Catecholamine with alpha and beta-adrenergic actions.
Drug Type	Inotropic vasopressor.
Trade Name	Aspen Adrenaline 1: 10,000 injection.
Presentation	1:10,000 ampoule [1 mg/10 mL]
Dosage / Interval	10–30 microgram/kg (0.1–0.3 mL/kg of a 1:10,000 solution) intravenous injection. This dose can be repeated every few minutes if the heart rate remains < 60 beats per minute despite effective ventilation and cardiac compressions. [1-3]
Maximum daily dose	The maximum single dose is 1 mg.
Route	Intravenous.
Preparation/Dilution	Draw up 0.1–0.3 mL.kg of adrenaline 1:10,000 ampoule [1 mg/10 mL] undiluted. [1 mL contains 0.1 mg (100 microgram) of adrenaline].
Administration	Intravenous as a rapid bolus ideally through a central venous catheter followed by a sodium chloride 0.9% flush. [1]
Monitoring	Assessment throughout the resuscitation is based on the infant's heart rate, breathing, tone and oxygenation. A prompt increase in heart rate remains the most sensitive indicator of resuscitation efficacy. [4] For babies requiring resuscitation and/or respiratory support, pulse oximetry is recommended both to monitor heart rate and to assess oxygenation. The sensor should be placed on the infant's right hand or wrist before connecting the probe to the instrument. Heart rate monitored using an oximeter should be checked intermittently during resuscitation by auscultation. [4]
Contraindications	Nil.
Precautions	Infants with arrhythmias, hypertension or hyperthyroidism. Infants with dilated or ischaemic cardiac disease. Intra-arterial and intramuscular administration should be avoided as it may cause local ischaemic damage.
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 and lactic acidosis especially at higher doses. Tissue ischaemia and necrosis especially if administered intra-arterially, intramuscularly or with extravasation.
Compatibility	Fluids: Glucose 5%, glucose 10%, Hartmann's, sodium chloride 0.9% Y-site: Amino acid solutions. Amiodarone, anidulafungin, atracurium, bivalirudin, caspofungin, cisatracurium, dexmedetomidine, dobutamine, dopamine, ethanol, fentanyl, glyceryl trinitrate, heparin sodium, milrinone, morphine sulfate, pancuronium, potassium chloride, ranitidine, remifentanil, sodium nitroprusside, tigecycline, tirofiban, vecuronium.
Incompatibility	Fluids: Sodium bicarbonate.

	Y-site: Aciclovir, aminophylline, ampicillin, atropine, azathioprine, calcium chloride, calcium gluconate, cefalotin, chloramphenicol, digoxin, ergometrine, ganciclovir, hyaluronidase', hydrocortisone sodium succinate, indomethacin, noradrenaline, phenobarbitone sodium, sodium bicarbonate, thiopentone, vancomycin.
Stability	Not for dilution. Discard remainder after use.
Storage	Ampoule: Store below 25°C. Protect from light.
Evidence summary	ILCOR treatment recommendation: If adequate ventilation and chest compressions have failed to increase the heart rate to > 60 beats per minute, then it is reasonable to use adrenaline despite the lack of human neonatal data. If adrenaline is indicated, a dose of 0.01–0.03 mg/kg should be administered intravenously as soon as possible. If adequate ventilation and chest compressions have failed to increase the heart rate to > 60 beats per minute and intravenous access is not available, then it is reasonable to administer tracheal adrenaline. (LOE IV, GOR B) If adrenaline is administered by the tracheal route, it is likely that a larger dose of 0.05–0.1 mg/kg will be required to achieve an effect similar to that of the 0.01 mg/kg intravenous dose. Higher intravenous doses cannot be recommended and may be harmful. [3] (LOE IV, GOR C) Pharmacokinetics: The plasma half-life of intratracheal adrenaline for newborn resuscitation is likely to average ~50 minutes. [5]
References	1. Australian Resuscitation C, New Zealand Resuscitation C. Medication or fluids for the resuscitation of the newborn infant. ARC and NZRC Guideline 2010. Emergency medicine Australasia : EMA. 2011;23:442-4. 2. de Caen AR, Kleinman ME, Chameides L, Atkins DL, Berg RA, Berg MD, Bhanji F, Biarent D, Bingham R, Coovadia AH, Hazinski MF, Hickey RW, Nadkarni VM, Reis AG, Rodriguez-Nunez A, Tibballs J, Zaritsky AL, Zideman D, Paediatric B, Advanced Life Support Chapter C. Part 10: Paediatric basic and advanced life support: 2010 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. Resuscitation. 2010;81 Suppl 1:e213-59. 3. Wyllie J, Perlman JM, Kattwinkel J, Atkins DL, Chameides L, Goldsmith JP, Guinsburg R, Hazinski MF, Morley C, Richmond S, Simon WM, Singhal N, Szyld E, Tamura M, Velaphi S. Part 11: Neonatal resuscitation: 2010 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. Resuscitation. 2010;81 Suppl 1:e260-87. 4. Australian Resuscitation C, New Zealand Resuscitation C. Assessment of the newborn infant. ARC and NZRC Guideline 2010. Emergency medicine Australasia : EMA. 2011;23:426-7. 5. 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. 6. Young TE, Mangum B [2008]. Neofax: A manual of drugs used in neonatal care. Acorn Publishing, Inc. Raleigh, NC 27619 7. Australian Injectable Drugs Handbook, 6th Edition, Society of Hospital Pharmacists of Australia 2014

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