Adrenaline (EPINEPHrine) intratracheal

Newborn use only

2021

Alert	
Indication	**Resuscitation of the Newborn Infant** If intravenous access is not available and adequate ventilation and chest compressions have failed to increase the heart rate to >60 beats per minute, then it is reasonable to administer endotracheal adrenaline if intravascular access is not available.(1)
Action	Catecholamine with alpha and beta adrenergic actions.
Drug type	Inotropic vasopressor.
Trade name	Aspen Adrenaline 1: 10,000 Adrenaline Acid Tartrate injection
Presentation	1:10,000 ampoule [100micrograms/1mL] as adrenaline acid tartrate(Recommended) 1: 10,000 Min-I-Jet Pre-filled syringe [100micrograms/1mL] as adrenaline hydrochloride (if ampoules are in short supply)
Dose	50–100 microgram/kg (0.5–1 mL/kg of a 1:10,000 solution) via endotracheal tube. The dosage interval is every 3 to 5 minutes if the heart rate remains less than 60 beats/min. If the intratracheal dose is not effective, an intravenous dose should be administered as soon as possible once venous access is established.[1, 2]
Dose adjustment	
Maximum dose	
Total cumulative dose	
Route	Intratracheal
Preparation	1:10,000 ampoule [100micrograms/1mL] undiluted.
Administration	Via an endotracheal tube as a single bolus. [1] Discard unusued portions.
Monitoring	Heart rate, breathing, tone and oxygenation.
Contraindications	Arrhythmias, hypertension or hyperthyroidism. Dilated or ischaemic cardiac disease (relative).
Precautions	Do not use if the injection is discoloured or contains a precipitate.
Drug interactions	
Adverse reactions	Tachycardia and arrhythmia. Systemic hypertension and lactic acidosis especially at higher doses.
Compatibility	Do not mix with saline or other fluids/medications.
Incompatibility	Not applicable
Stability	Not for dilution.
Storage	Store below 25°C. Protect from light.
Excipients	Tartaric acid, sodium metabisulfite, sodium chloride and water for injections.
Special comments	A prompt increase in heart rate remains the most sensitive indicator of resuscitation efficacy.[3]
Evidence	**Efficacy** 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care: Neonatal resuscitation: (1) 1. Administration of epinephrine via a low-lying umbilical venous catheter provides the most rapid and reliable medication delivery. The intravenous dose of epinephrine is 0.01 to 0.03 mg/kg, followed by a normal saline flush. If umbilical venous access has not yet been obtained, epinephrine may be given by the endotracheal route in a dose of 0.05 to 0.1 mg/kg. The dosage interval for epinephrine is every 3 to 5 minutes if the heart rate remains less than 60/min, although an intravenous dose may be given as soon as umbilical access is obtained if response to endotracheal epinephrine has been inadequate. 2. One very limited observational study (human) showed 0.03 mg/kg to be an inadequate endotracheal dose. In the perinatal model of cardiac arrest, peak plasma epinephrine concentrations in animals were higher and were achieved sooner after central or low-lying umbilical venous administration compared with the endotracheal route, despite a lower intravenous dose (0.03 mg/kg intravenous versus 0.1 mg/kg endotracheal route).

	3. The perinatal model of cardiac arrest documented peak plasma epinephrine concentrations at 1 minute after intravenous administration, but not until 5 minutes after endotracheal administration. **Safety** Repetitive endotracheal doses or higher intravenous doses may result in potentially harmful plasma levels that lead to associated hypertension and tachycardia.(1) **Pharmacokinetics** The plasma half-life of intratracheal adrenaline for newborn resuscitation is likely to average ~50 minutes.(4)
Practice points	2020 Recommendations for Epinephrine Administration in Neonatal Resuscitation: (1) 1. If the heart rate has not increased to 60/min or more after optimizing ventilation and chest compressions, it may be reasonable to administer intravascular(intravenous or intraosseous) epinephrine (0.01 to 0.03 mg/kg). 2. While vascular access is being obtained, it may be reasonable to administer endotracheal epinephrine at a larger dose (0.05 to 0.1 mg/kg). 3. If endotracheal epinephrine is given before vascular access is available and response is inadequate, it may be reasonable to give an intravascular dose as soon as access is obtained, regardless of the interval. 4. It may be reasonable to administer further doses of epinephrine every 3 to 5 min, preferably intravascularly, if the heart rate remains less than 60/min.
References	1. Aziz K, Lee HC, Escobedo MB, Hoover AV, Kamath-Rayne BD, Kapadia VS, Magid DJ, Niermeyer S, Schmölzer GM, Szyld E, Weiner GM. Part 5: neonatal resuscitation: 2020 American heart association guidelines for cardiopulmonary resuscitation and emergency cardiovascular care. Circulation. 2020 Oct 20;142(16_Suppl_2):S524-50. 2. Australian injectable drugs handbook. Adrenaline (epinephrine). Accessed on 4 May 2021. 3. Micromedex. Epinephrine. Accessed on 4 May 2021. 4. 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.

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