Queensland Paediatric Emergency Care

Skill Sheets

Adrenaline (epinephrine) use in Croup or Stridor

Adrenaline (epinephrine) is a drug that is used as a life-saving pharmacological intervention for multiple patient presentation types in the Emergency Department (ED). This skill sheet will focus on it's use in CROUP or STRIDOR. It is vital that the correct solution of adrenaline is selected and prepared to the right concentration. 1:1000 concentration adrenaline (epinephrine) should be used in croup.

Adrenaline (epinephrine)
1:1000
= 1mg in 1mL
= 1000mcg in 1mL

The first-line adrenaline (epinephrine) administration route is aerosolised via a nebuliser. Most children will respond well to nebulised administration. Dosing and preperation is as per Croup Guideline and Flowchart. It is highly recommended that the Children's Resuscitation Emergency Drug Dosage (CREDD) is utilised in all emergencies. Prior to all episodes of medication administration, the routine safety checks should be completed.

ALERT –

In all situations where adrenaline (epinephrine) is being administered, the child must be in a high acuity area and on cardiac monitoring. The patients should have continuous monitoring by a senior registered nurse and a senior medical officer should be readily available.

CREDD Tip:

20kg

Reversal agents	Vial concentration	Recommended dose/kg	Preparation: Dilution – Sodium Chloride 0.9%	Preparation: Final concentration	Dose	Final volume to administer	Administration
Sugammadex (200 mg/2 mL) Rocuronium reversal	100 mg/mL	16 mg/kg	Undiluted	100 mg/mL	**320 mg**	3.2 mL	Push
Flumazenil (500 microg/5 mL) Benzodiazepine reversal	100 microg/mL	5 microg/kg	Undiluted	100 microg/mL	**100 microg**	1 mL	Push – Every 60 secs Max single dose 200 microg Max total dose 2000 microg
Naloxone (400 microg/mL) Opioid reversal	400 microg/mL	10 microg/kg	Undiluted	400 microg/mL	**200 microg**	0.5 mL	Push – Every 2 - 3 mins May be given IM

Respiratory	Vial concentration	Recommended dose/kg	Dilution – Sodium Chloride 0.9%	Final concentration	Dose	Final volume	Administration
Nebulised Adrenaline (Epinephrine) 1:1000	1 mg/mL		Undiluted	1 mg/mL	**5 mg**	5 mL	Via nebuliser
Dexamethasone (4 mg/mL)	4 mg/mL	0.6 mg/kg	Undiluted	4 mg/mL	**6 mg**	1.5 mL	IV or IM
Magnesium Sulfate (10 mmol/5 mL)	2 mmol/mL	0.2 mmol/kg	Dilute 5 mL (10 mmol) to 50 mL	0.2 mmol/mL	**4 mmol**	20 mL	Infuse over 20 mins
Hydrocortisone (100 mg + 2 mL diluent)	50 mg/ mL	4 mg/kg	*Reconstitute vial with 2 mL WFI*	50 mg/mL	**80 mg**	1.6 mL	Push over 30 secs or IM
Methylprednisolone (40 mg/mL) sodium succinate	40 mg/mL	1 mg/kg	Dilute 1 mL (40 mg) to 4 mL	10 mg/mL	**20 mg**	2 mL	Push over 5 mins Sodium succinate ONLY
Salbutamol (5 mg/5 mL)	1 mg/mL	0.1 mg/kg	Dilute 5 mL (5 mg) to 50 mL	0.1 mg/mL	**2 mg**	20 mL	Load – Infuse over 20 mins
AmiNOPHYLLine (250 mg/10 mL)	25 mg/mL	5 mg/kg	Dilute 10 mL (250 mg) to 50 mL	5 mg/mL	**100 mg**	20 mL	Load – Infuse over 30 mins

Neurology/seizures	Vial concentration	Recommended dose/kg	Dilution – Sodium Chloride 0.9%	Final concentration	Dose	Final volume	Administration
Midazolam – **IV**	Various strengths	0.15 mg/kg	Dilute to 1 mg/mL regardless of ampoule strength	1 mg/mL	**3 mg**	3 mL	Push
Midazolam – **IM**	5 mg/mL	0.2 mg/kg	Undiluted	5 mg/mL	**4 mg**	0.8 mL	IM
Midazolam – **Buccal/Nasal**	5 mg/mL	0.3 mg/kg	Undiluted	5 mg/mL	**6 mg**	1.2 mL	Drip dose into alternate nostrils or inside cheek
Phenytoin (100 mg/2 mL) (250 mg/5 mL)	50 mg/mL	20 mg/kg	Dilute 10 mL (500 mg) to 50 mL	10 mg/mL	**400 mg**	40 mL	Infuse over 20 mins *use 0.22 micron filter*
Phenobarbitone (Phenobarbital) (200 mg/mL)	200 mg/mL	20 mg/kg	Dilute 2 mL (400 mg) to 20 mL	20 mg/mL	**400 mg**	20 mL	Infuse over 20 mins
Levetiracetam (500 mg/5 mL)	100 mg/mL	60 mg/kg	Dilute 15 mL (1500 mg) to 30 mL	50 mg/mL	**1200 mg**	24 mL	Push over 5 mins
Sodium Valproate (400 mg/4 mL)	100 mg/mL	40 mg/kg	Dilute 8 mL (800 mg) to 20 mL	40 mg/mL	**800 mg**	20 mL	Infuse over 10 mins
Mannitol 20%	0.2 g/mL	0.5 g (2.5 mL)/kg	Pre-mixed bag	0.2 g/mL	**10 g**	50 mL	Infuse over 10 mins *use 5 micron filter*
Sodium Chloride 3% – Hypertonic *For raised ICP or hyponatremic seizures*	0.5 mmol/mL	3 mL/kg	Pre-mixed bag	0.5 mmol/mL	**60 mL**	60 mL	Infuse over 10 mins via central/large vein

20kg

In the CREDD, nebilised adrenaline (epinephrine) is featured in the RESPIRATORY section in the medications per weight section.

Dosing weights are listed down the right-hand side of the page. In this example, the instructions pertain to a child with an ideal body weight (IBW) of 20kg.

NEBULISED Adrenaline (epinephrine) Preperation

Adrenaline (epinephrine) via a nebuliser may be used to open up the airway in airway constricting conditions such as croup or anaphylaxis. In conjunction with this skill sheet, please refer to the Croup Guideline and Flowchart or Anaphylaxis and Allergy Guideline and Flowchart. If adrenaline (epinephrine) is administered via a nebuliser in anaphylaxis, it must also have been administered INTRAMUSCULARLY.

1 GATHER EQUIPMENT

5 x 1:1000 adrenaline (epinephrine)

Drawing up needle

5mL syringe

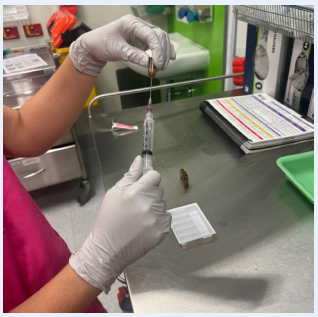
Nebuliser pot and mask

Oxygen tubing

*Intravenous bolus adrenaline is not appropriate in the treatment of CROUP or STRIDOR.

2 PREPARE

Draw up 5mL of 1:1000 adrenaline (epinephrine) into the 5mL syringe. In all ages/ weights, the adrenaline dose will be 5mg via nebuliser.



3

Put the 5mL of 1:1000 adrenaline (epinephrine) into the nebuliser pot.

4

Connect the nebuliser pot to the mask. Attach the oxygen tubing.

5

Attach the oxygen tubing to the wall high flow delivery system. Turn flow to at least 6L/min.

7

Put mask to patient's face for the duration of the administration.

CHALLENGES

Many children (particularly infant to pre-school aged) are afraid of the mask. It is essential to involve the child's caregiver in the process. The child will be made more at ease if age-appropriate communication strategies are utilised. For example, a game in which the mask is a make-believe space mask can turn the experience into a fun game.

It is vitally important that throughout the process that the child remains calm. Distress will worsen the symptoms.

Nebulised adrenaline (epinephrine) can cause a stinging sensation in the eyes, therefore is it important to ensure the mask is held in a way that stops the aerosolised solution coming into contact with the eyes.

For further information:

Guideline: Croup

Flowchart: Croup

Skill Sheets: Croup

References:

Children's Health Queensland Hospital and Health Service. (2021, June). Children's Resuscitation Emergency Drug Dosage (CREDD) 2nd Edition. Retrived from https://www.childrens.health.qld.gov.au/qpec-paediatric-resuscitation-tools/#tab-6ff1bb73468033104a2

Children's Health Queensland Hospital and Health Service. (2023, February 1). Croup- Emergency management in children. Retrieved from https://www.childrens.health.qld.gov.au/guideline-croup-emergency-management-in-children/

This Queensland Paediatric Emergency Skill Sheet was developed by the Emergency Care of Children working group.

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