

Acute Severe Asthma (in children aged ≥ 2 years)

Past History: **Previous PICU** Previous iv bronchodilators Exacerbation Frequency
Routine meds Frequency of steroids Compliance

ASSESS SEVERITY	AGE 2-5 YEARS		AGE >5 YEARS	
	Acute Severe Asthma	Life threatening Asthma	Acute Severe Asthma	Life threatening Asthma
	<ul style="list-style-type: none"> SpO₂ < 92% RR > 40/min HR > 140 bpm Too breathless to talk or feed 	<ul style="list-style-type: none"> SpO₂ < 92% Silent chest Poor resp effort/exhaustion Altered consciousness Hypotension 	<ul style="list-style-type: none"> SpO₂ < 92% RR > 30/min HR > 125 bpm Too breathless to talk (PEF 33-50% best or predicted) 	<ul style="list-style-type: none"> SpO₂ < 92% Silent chest Poor resp effort/exhaustion Altered consciousness Hypotension (PEF < 33% best or predicted)

LIFE- THREATENING FEATURES REFRACTORY TO TREATMENT: CONSULTANT PAEDIATRIC & ANAESTHETIC REVIEW AND CALL NECTAR

FIRST LINE	OXYGEN to maintain SpO ₂ \geq 94%		Chest XR indications:
	BRONCHODILATORS (repeat doses every 20-30 min for 2 hrs if needed)		
	<ul style="list-style-type: none"> Nebulised Salbutamol: 2.5mg for \leq5 yrs 5mg if >5 yrs Nebulised Ipratropium: 250mcg for \leq12 yrs 500mcg for >12yrs Nebulised Magnesium: consider adding 150mg of magnesium sulfate (can use ampoule for injection) to each salbutamol and ipratropium neb in the first hour for acute severe asthma with an SpO₂ < 92% 		<ul style="list-style-type: none"> Surgical emphysema Severe/Life threatening Asthma refractory to treatment
	STERIODS - give within 1 hour of presentation <ul style="list-style-type: none"> Oral Prednisolone : 1-2mg/kg max 40mg OR 20mg for \leq5yrs 40mg for >5 yrs 2mg/kg if on maintenance steroids max 60mg IV hydrocortisone 4mg/kg (max 100mg) if unable to tolerate oral prednisolone 		Looking for: Pneumothorax/sc emphysema Collapse/ consolidation Atelectasis Alternative diagnosis: airway compression, FB, mediastinal mass, haemangioma

SECOND LINE	Worsening status: Consider CXR, Gas, ECG monitoring, regular BP URGENT REVIEW BY CONSULTANT PAEDIATRICIAN		Humidified High Flow Nasal Cannula Oxygen (HHFNC)
	MAGNESIUM SULFATE IV (≥ 2 yrs) <ul style="list-style-type: none"> 40mg/kg (max 2g) over 20 min. May be repeated in discussion with NECTAR <i>Dilute dose of Magnesium Sulfate 50% (500mg/ml) up to 20ml with 0.9%NaCl to give max concentration of 10% (100mg/ml)- may be infused peripherally</i> 		
	AMINOPHYLLINE IV <ul style="list-style-type: none"> Loading (to be omitted if on oral theophylline) 5mg/kg (max 500mg) Infusion: 1mg/kg/hr <12 yrs 0.5-0.7 mg/kg/hr if >12 years In obesity calculate ideal weight for height or age for infusion (Max 50mg/hr) ECG, monitor U+Es and levels 4-6 hourly (aim 10-20mg/l or 55-110 micromol/L) 		2 l/kg/min for first 10kg + 0.5l/kg/min for each further kg Consider early, shouldn't delay intubation
	SALBUTAMOL IV <ul style="list-style-type: none"> Loading: 15mcg/kg/min over 5-10 mins (max 250mcg) Infusion: 1-2mcg/kg/min Be aware: max adult dose 20mcg/min Higher doses increase likelihood of toxicity: \uparrow HR \downarrowK+ \uparrow lactate agitation, tremor Don't infuse in the same line as aminophylline, can infuse with magnesium 		RELATIVE INDICATIONS FOR INTUBATION: SpO ₂ < 92% on 15l/min O ₂ or HHFNC after 1 st and 2 nd line therapy with: <ul style="list-style-type: none"> New/Deteriorating Hypercarbia- rare in asthma- sign of fatigue Reduced GCS/agitation Poor air entry/Silent chest \downarrowHR and \downarrowBP are pre-terminal signs
	HYDROCORTISONE - repeat 4mg/kg (max 100mg) 6 hourly		

INTUBATION	High risk intubation- (rare event)		Pitfalls
	<ul style="list-style-type: none"> Most experienced intubators x2 Pre-oxygenate for at least 3 min. Can use HHFNC if no delay 10-20ml/kg fluid bolus to maintain BP. Prepare peripheral adrenaline Ketamine 1-2mg/kg, Rocuronium 1 mg/kg then 0.5mg/kg/hr infusion Tight fitting cuffed ETT. NG asap post intubation Sedation: Fentanyl, Midazolam, Ketamine or inhalational agents 		
	Initial Ventilation Principles <ul style="list-style-type: none"> Pressure control with sufficient PIP to move chest (Limit PIP < 35cmH₂O) Starting PEEP 5 cmH₂O (NB auto PEEP), starting I:E of 1:2, but may need longer expiratory time Resp rate 5-10 breaths <usual- ensure flow reaches 0 before next breath Aim SpO₂ > 90%. Accept high pCO₂ (7-10kPa) 		AVOID atracurium/morphine <ul style="list-style-type: none"> BP falling due to dynamic hyperinflation/air trapping -> disconnect ETT from vent circuit and manually decompress -> give more volume Mucous plugging, Pneumothorax, Auto PEEP If failing to ventilate- hand ventilate enough to move chest ETCO₂ may not correlate with pCO₂ Consider inhalational agents if struggling to ventilate/oxygenate