



## CG001 Acute Severe Asthma (Adults)

### 1. Key Recommendations for operational use

For use by: Medical teams. Internet: Yes

1	Initial	<ul style="list-style-type: none"> <li>• Use controlled supplemental oxygen therapy to keep SpO<sub>2</sub> 94-98%.</li> <li>• Nebulise salbutamol 5mg in oxygen and repeat every 15-30minutes. <ul style="list-style-type: none"> <li>- consider continuous nebulisation (10mg/hr) if the appropriate device is available.</li> </ul> </li> <li>• Give steroids: Prednisolone 50mg PO, or Hydrocortisone succinate 100mg IV 6 hourly.</li> </ul>
2	Ipratropium	<ul style="list-style-type: none"> <li>• Add 0.5mg nebuliser in oxygen (repeat 4 hourly).</li> </ul>
3	Investigations	<ul style="list-style-type: none"> <li>• Chest X-ray if life threatening or failure to respond.</li> <li>• Arterial blood gas: if S<sub>p</sub>O<sub>2</sub> &lt;92% (on or off oxygen) / life threatening. <ul style="list-style-type: none"> <li>- consider measuring lactate and potassium at the same time.</li> </ul> </li> </ul>
4	Magnesium	<ul style="list-style-type: none"> <li>• Consider: 2g / 8mmol: 4ml of 50% Magnesium Sulphate in 100ml saline over 20mins - once only.</li> </ul>
5	IV Salbutamol	<ul style="list-style-type: none"> <li>• Consider infusion: 5mg salbutamol in 50ml saline (100 mcg/ml). <ul style="list-style-type: none"> <li>- start at 3 ml/hr: (5 mcg/min); increase to 12 ml/hr (20 mcg/min).</li> </ul> </li> <li>• Monitor serum potassium and heart rate.</li> <li>• Consider bolus: 250mcg in young adults if infusion not available (section 4.5).</li> </ul>
6	IV Aminophylline	<ul style="list-style-type: none"> <li>• Consider bolus: 5 mg/kg in 100ml saline loading at 25mg/min.</li> <li>• Do not bolus if usually on oral maintenance therapy.</li> <li>• Use ideal body weight if obese.</li> <li>• Consider infusion: 0.5 mg/kg/hr (section 4.6).</li> </ul>
7	Adrenaline	<ul style="list-style-type: none"> <li>• Consider: 0.5mg IM once if life threatening and not improving.</li> </ul>
8	Antibiotics	<ul style="list-style-type: none"> <li>• Do not use routinely; consider only if evidence of bacterial infection.</li> </ul>
9	Anaesthesia	<ul style="list-style-type: none"> <li>• Likely dehydrated - fluid resuscitate if possible before induction.</li> <li>• Use a familiar induction regime; both Ketamine and Propofol have bronchodilator effects.</li> <li>• Both Ketamine and Propofol can then be given by infusion (CG011 Drug Infusions).</li> <li>• Avoid morphine - use alfentanil.</li> <li>• Allow prolonged expiratory phase: slow rate and prolong I:E <ul style="list-style-type: none"> <li>- refer to CG018 Mechanical ventilation (section 13).</li> </ul> </li> <li>• Consider manual chest compression.</li> </ul>
10	NIV	<ul style="list-style-type: none"> <li>• There is insufficient evidence to make a recommendation.</li> </ul>
11	Extra-corporeal support	<ul style="list-style-type: none"> <li>• Consider seeking advice from the ECMO co-ordinator, Aberdeen Royal Infirmary for patients who remain unstable on mechanical ventilation.</li> </ul>



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2. Document History			
Reference Number	CG001		
Version	2		
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	SAS	Paramedics	X
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	ScotSTAR	EMRS West	✓
		EMRS North	✓
		Paediatric	X
		Neonatal	X
Tayside Trauma Team		✓	





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### 3. Scope and purpose

- Overall objectives:

Asthma has considerable morbidity and mortality associated with acute exacerbations. Prompt recognition of severe or life threatening asthma and aggressive management with escalation of treatment, if no response, is required. The aim of this guideline is to summarise an incremental management plan to adult patients with acute severe or life-threatening asthma that can be applied to a remote and rural healthcare setting, mindful of variable resources between these facilities.

- Statement of intent:

This guideline is not intended to be construed or to serve as a standard of care. Adherence to guideline recommendations will not ensure a successful outcome in every case, nor should they be construed as including all proper methods of care or excluding other acceptable methods of care aimed at the same results. The ultimate judgement must be made by the appropriate healthcare professional(s) responsible for clinical decisions regarding a particular clinical procedure or treatment plan.

- Feedback:

Comments on this guideline can be sent to: [sas.cpg@nhs.scot](mailto:sas.cpg@nhs.scot)

- Equality Impact Assessment:

Applied to the ScotSTAR Clinical Standards group processes.

- Guideline process endorsed by the Scottish Trauma Network Prehospital, Transfer and Retrieval group.





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4. Explanatory Statements		
	Authors' recommendation	Level [Reference]
<p><b>4.1 Initial management</b></p> <ul style="list-style-type: none"> <li>Use controlled supplemental oxygen therapy to keep SpO<sub>2</sub> 94-98%.</li> <li>Nebulise salbutamol 5mg in oxygen and repeat every 15-30minutes.               <ul style="list-style-type: none"> <li>consider continuous nebulisation (10mg/hr) if the appropriate device is available.</li> </ul> </li> <li>Give steroids: Prednisolone 50mg PO or Hydrocortisone succinate 100mg IV 6 hourly.</li> </ul> <p>Titrate oxygen as soon as SpO<sub>2</sub> monitoring is established. Use nebulised salbutamol first line (rather than IV). Continuous nebulisation (10mg/hr) may have advantage if the correct device is available and when there is poor response to initial bolus nebulisers. Give steroids as early as possible, IV if there are issues with the oral route.</p>	Strong	Guidelines [1,2]
<p><b>4.2 Ipratropium</b></p> <ul style="list-style-type: none"> <li>Add 0.5mg nebuliser in oxygen (repeat 4 hourly).</li> </ul> <p>In severe or life-threatening asthma or when initial response to bolus β<sub>2</sub>-agonists is poor.</p>	Strong	Guidelines [1,2]
<p><b>4.3 Investigations</b></p> <ul style="list-style-type: none"> <li>Chest X-ray if life threatening or failure to respond.</li> </ul> <p>CXR is indicated in life-threatening asthma; failure to respond; when ventilation is required or with suspicion of pneumothorax, pneumomediastinum or consolidation.</p> <ul style="list-style-type: none"> <li>Arterial blood gas: if S<sub>p</sub>O<sub>2</sub> &lt;92% (on or off oxygen) / life threatening.               <ul style="list-style-type: none"> <li>Consider measuring lactate and potassium at the same time.</li> </ul> </li> </ul> <p>ABG is required with life threatening features or when S<sub>p</sub>O<sub>2</sub> &lt;92% (on or off oxygen) in order to detect hypercarbia. A serum potassium and lactate can also be obtained at this point. Raised lactate levels may indicate β-agonist toxicity.</p>	Strong	Guidelines [1,2]
<p><b>4.4 Magnesium</b></p> <ul style="list-style-type: none"> <li>Consider: 2g / 8mmol: 4ml of 50% Magnesium Sulphate in 100ml saline over 20mins - once only.</li> </ul> <p>In patients who have not responded to β<sub>2</sub>-agonists a single dose of IV magnesium is likely to be safe although the benefit is uncertain. Do not use nebulised magnesium. Do not give a second dose due to theoretical risk of respiratory muscle weakness.</p>	Conditional	Guidelines [1,2]



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4.5 IV Salbutamol	Authors' recommendation	Level [Reference]
<ul style="list-style-type: none"> <li>Consider infusion: 5mg salbutamol in 50ml saline (100 mcg/ml).               <ul style="list-style-type: none"> <li>Start at 3 ml/hr: (5 mcg/min); increase to 12 ml/hr (20 mcg/min).</li> </ul> </li> <li>Monitor serum potassium and heart rate.</li> </ul> <p>Benefit of IV over, or in addition to nebulised salbutamol is uncertain [3,4] although it remains on some guidelines [5,6] and is acknowledged in others [1].</p>	Conditional	1++ [3,4] Guidelines [1,5,6]
<ul style="list-style-type: none"> <li>Consider bolus: 250mcg in young adults if infusion not available.</li> </ul> <p>Bolus salbutamol remains a recommendation for children [1] with acute asthma. Consider single bolus of IV salbutamol in young adults if there is a reason why an infusion cannot be started.</p> <p>Take 0.5ml of 5mg/5ml IV salbutamol ampoule, dilute to 10ml (50 mcg/ml). Give 5ml over 5 mins as 1ml observed boluses.</p>	GPP	
4.6 IV Aminophylline		
<ul style="list-style-type: none"> <li>Consider bolus: 5 mg/kg in 100ml saline loading over 20mins.</li> <li>Do not bolus if usually on oral maintenance therapy.</li> <li>Use ideal body weight if obese.</li> <li>Consider infusion: 0.5 mg/kg/hr.</li> </ul> <p>In patients who with a poor response to initial treatment. Benefit is uncertain. Increases the incidence of arrhythmia. For obese patients, use ideal body weight.</p> <p>For the infusion, add 500mg aminophylline to 500ml glucose or saline (1mg/ml). Run through a pump or draw into 50ml syringes for a syringe driver. Infusion for a 70kg patient will be 35ml/hr.</p>	Conditional	Guideline [1]
4.7 Adrenaline		
<ul style="list-style-type: none"> <li>Consider: 0.5mg IM once if life threatening and not improving.</li> </ul>	Conditional	Guidelines [5,7]
4.8 Antibiotics		
<ul style="list-style-type: none"> <li>Do not use routinely; consider only if evidence of bacterial infection.</li> </ul>	Strong	Guidelines [1,2]



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4.9 Anaesthesia	Authors' recommendation	Level [Reference]
<ul style="list-style-type: none"> <li>Likely dehydrated - fluid resuscitate if possible before induction.</li> </ul>	GPP	
<ul style="list-style-type: none"> <li>Use a familiar induction regime. Both Ketamine and Propofol have bronchodilator effects.</li> <li>Both Ketamine and Propofol can subsequently be given by infusion (CG011 Drug Infusions).</li> </ul>	Conditional	4 [2,8,9]
<ul style="list-style-type: none"> <li>Avoid morphine - use alfentanil.</li> <li>Allow prolonged expiratory phase: slow rate and prolong I:E - refer to CG018 Mechanical ventilation (section 13).</li> </ul>	Conditional	4 [2,8,9]
<ul style="list-style-type: none"> <li>Consider manual chest compression.</li> </ul>	Conditional	4 [8]
<b>4.10 Non invasive ventilation</b>		
<ul style="list-style-type: none"> <li>There is insufficient evidence to make a recommendation.</li> </ul>		Guidelines [1,2]
<b>4.11 Extracorporeal Support</b>		
<ul style="list-style-type: none"> <li>Consider seeking advice from the ECMO co-ordinator, Aberdeen Royal Infirmary for patients who remain unstable on mechanical ventilation.</li> </ul> <p>Extracorporeal support (either ECMO or CO<sub>2</sub> removal) may have a role in asthmatic patients who, despite mechanical ventilation, have significant acidaemia (pH &lt;7.20, H<sup>+</sup>&gt;60) or cardiovascular instability. Call the Aberdeen ECMO referral number listed in departmental contact details on the app.</p>	Conditional	Guidelines [1,2]



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### 5. References

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