

Figure 1. Clinical pathways for asthma exacerbation

Evaluation: Including vital signs, PRAM score ± FEV <sub>1</sub>			
INITIAL TREATMENT: FIRST HOUR			
For all: OXYGEN to keep saturation ≥92%			
Mild PRAM 0 to 3 FEV <sub>1</sub> >70%	Moderate PRAM 4 to 7 FEV <sub>1</sub> 50% to 70%	Severe PRAM 8 to 12 FEV <sub>1</sub> <50%	Impending respiratory failure – Confused, drowsy, lethargic, cyanotic, decreasing respiratory effort
<ul style="list-style-type: none"> <li>Salbutamol every 30 to 60 minutes for 1 to 2 treatments</li> <li>Consider oral steroids (particularly for children with risk factors for severe asthma)</li> </ul>	<ul style="list-style-type: none"> <li>Keep patient calm, seated</li> <li>Salbutamol every 30 minutes for 2 to 3 treatments</li> <li>For PRAM 6 to 7: Consider adding ipratropium with the first 3 salbutamol treatments</li> <li>For all: Oral steroids before or immediately after first treatment</li> </ul>	<ul style="list-style-type: none"> <li>Keep patient calm, seated</li> <li>Salbutamol with ipratropium, every 20 minutes for 3 treatments</li> <li>Oral steroids before or immediately after first treatment</li> </ul> <p><b>When PRAM is 11 to 12 or if response is poor:</b></p> <ul style="list-style-type: none"> <li>Cardiopulmonary monitor, 1 to 2 IV lines</li> <li>Patient NPO</li> <li>Continuous nebulized salbutamol and ipratropium for 60 minutes (equivalent to 3 treatments in 60 minutes)</li> <li>IV steroids (if vomiting or not improving)</li> <li>IV magnesium sulfate</li> <li>CXR, blood gas</li> <li><b>CALL FOR HELP:</b> PICU</li> <li>Consider IV salbutamol</li> <li>Consider heliox-driven beta2-agonist nebulization</li> <li>Consider noninvasive ventilation until HELP arrives</li> </ul>	<ul style="list-style-type: none"> <li><b>CALL FOR HELP:</b> PICU, anesthesia</li> <li><b>Keep patient NPO and calm, seated</b></li> <li>O<sub>2</sub> 100% via non-rebreather mask</li> <li>Support ventilation when required</li> <li>Consider tension pneumothorax</li> <li>Cardiopulmonary monitor, 2 IV lines or intraosseous if no IV line available</li> <li>Blood gas + electrolytes</li> <li>Support hemodynamics</li> <li>Continuous nebulized salbutamol and ipratropium for 60 minutes</li> <li>IV/IM steroids</li> <li>IV magnesium sulfate</li> <li>CXR when possible</li> <li>Consider IV salbutamol</li> <li>Consider heliox-driven beta2-agonist nebulization, ketamine, anesthetic gases</li> <li>Consider noninvasive ventilation until HELP arrives</li> <li><b>At any point, if patient is not responding to treatment and has impending respiratory failure, consider rapid sequence intubation by the most experienced person available, with IV ketamine</b></li> </ul>

<b>Re-evaluation: Including vital signs, PRAM score</b>			
<b>SECOND HOUR OF TREATMENT</b>			
<b>Mild PRAM 0 to 3</b>	<b>Moderate PRAM 4 to 7</b>	<b>Severe PRAM 8 to 12</b>	<b>Impending respiratory failure – Confused, drowsy, lethargic, cyanotic, decreasing respiratory effort</b>
<ul style="list-style-type: none"> <li>Consider discharge if PRAM 0 to 3 for at least 1 to 2 h after last treatment</li> <li>Treatment plan</li> <li>Follow-up</li> <li>Discharge instructions</li> <li>Consider oral steroids at home</li> </ul>	<ul style="list-style-type: none"> <li>Salbutamol every 30 minutes for another 2 to 3 treatments</li> <li>For PRAM 6 to 7: Consider ipratropium every 30 minutes for 3 treatments with salbutamol, if not already given in the first hour</li> </ul>	<ul style="list-style-type: none"> <li>Patient NPO</li> <li>Salbutamol every 20 minutes for another 3 treatments</li> <li>Ipratropium every 20 minutes for 3 treatments, if not already given</li> <li>Plan an admission to hospital</li> <li>Consider calling for help if not responding: PICU, and treat as outlined above (continuous nebulized treatment salbutamol and ipratropium, IV steroids, and IV magnesium)</li> </ul>	<ul style="list-style-type: none"> <li>CALL FOR HELP, patient NPO</li> <li>ADMIT/TRANSFER TO PICU</li> <li>Treat as outlined above</li> </ul>
<b>Re-evaluation: Including vital signs, PRAM score</b>			
<b>4 HOURS POST STEROIDS ADMINISTRATION</b>			
<b>Mild PRAM 0 to 3</b>	<b>Moderate PRAM 4 to 7</b>	<b>Severe PRAM 8 to 12</b>	<b>Impending respiratory failure – Confused, drowsy, lethargic, cyanotic, decreasing respiratory effort</b>
<ul style="list-style-type: none"> <li>Consider discharge if symptoms improved and PRAM 0 to 3 for at least 1 h after last treatment</li> <li>Treatment plan</li> <li>Follow-up</li> <li>Discharge instructions</li> <li>Consider oral steroids at home</li> </ul>	<ul style="list-style-type: none"> <li>CONTINUE treatment as above</li> <li>CONSIDER ADMISSION to hospital if not improving</li> </ul>	<ul style="list-style-type: none"> <li>CALL FOR HELP, patient NPO</li> <li>ADMIT/TRANSFER TO PICU</li> <li>Treat as outlined above</li> </ul>	<ul style="list-style-type: none"> <li>CALL FOR HELP, patient NPO</li> <li>ADMIT/TRANSFER TO PICU</li> <li>Treat as outlined above</li> </ul>

FEV1: Forced expiratory volume in 1 second, IV: Intravenous PRAM: Pediatric Respiratory Assessment Measure

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