Pediatric Asthma Exacerbation Pathway in the Emergency Department

The following information is intended as a guideline for the acute management of children with asthma. Management of your patient may require a more individualized approach.

Inclusion Criteria: 2 y/o or greater with history of asthma or recurrent wheezing presenting with acute onset of wheezing, cough, dyspnea, hypoxia, tachypnea etc.

Exclusion Criteria: < 2 years of age, Diagnosed with viral bronchiolitis or croup, History of Cystic Fibrosis, Chronic Lung Disease, Cardiac Disease, Airway Anomalies

1. Measure oxygen saturation and vital signs.
2. Identify risk factors: Previous intubation/ICU admission, 2+ admissions in past year, Prior ED/admission in last month, >2 canisters of SABA per month, poor perception of symptoms

1. Apply Continuous Cardiopulmonary Monitors and Pulse Oximetry. Administer O2 as needed to keep sat goal >92%
2. Nurse to calculate Pediatric Asthma Score (PAS)
3. Notify Provider of PAS and begin appropriate order set based on PAS.
4. Administer Corticosteroids* 2mg/kg (PO / IV) PAS of 3 or greater unless previously administered in the last 12 hours. *Seek medical direction for scores 0-2.

Mild Distress = PAS 1-2
- (≤15kg) Albuterol MDI 4 puffs
- (>15kg) Albuterol MDI 4-8 puffs
  Alternative:
  - (≤15kg) Albuterol neb 2.5mg
  - (>15kg) Albuterol neb 5mg
- Consider oral steroids
- Repeat PAS 15 min after treatment (preferably by same provider)
- May repeat at provider’s discretion

Moderate Distress = PAS 3-5
- (≤15kg) Albuterol MDI 4 puffs followed by ipratropium MDI 4 puffs **
- (>15kg) Albuterol MDI 4-8 puffs followed by ipratropium MDI 4-8 puffs **
- **May repeat up to 3 total doses in first hour**
  Alternative – may be repeated as above:
  - (≤15kg) Albuterol neb 2.5mg with ipratropium 0.5mg neb
  - (>15kg) Albuterol neb 5mg with ipratropium

Severe Distress = PAS 6-10
- Albuterol 0.5mg/kg/hr (max of 20 mg) with ipratropium 0.5 mg to 1.5mg neb continuously for 1 hour.
- Perform & document PAS every 15 min.
  Alternative:
  - (≤15kg) Albuterol neb 2.5mg with ipratropium 0.5mg neb **
  - (>15kg) Albuterol neb 5mg with ipratropium 0.5mg neb **
  **May repeat up to 3 total doses in first hour**
- Consider adjunct therapy (Mg²⁺, Heliox, etc.)
- Repeat PAS 15 min after each treatment (preferably by the same provider)

Corticosteroids* 2mg/kg (PO / IV) PAS of 3 or greater unless previously administered in the last 12 hours. *Seek medical direction for scores 0-2.

Calculate PAS hourly. Plan disposition at 2 hrs. of presentation. Disposition decision no later than 4 hrs.

Hourly Reassessment

Symptoms Resolve / Patient Stable - Discharge
- Contact PCP for follow up
- Education regarding proper medication administration
- Rx for albuterol Q4 hours for cough or worsening symptoms
- Rx for oral corticosteroids for 3-10 days
- Consider maintenance therapy (inhaled corticosteroids)
- Provide patient with Asthma Action Plan

Symptoms Persist / Patient Unstable - Admission
- Admit – follow appropriate inpatient order set and flow sheet
- Continue bronchodilators
- Perform PAS prior to transfer to floor
- Consider adjunct therapy (magnesium, Heliox)
- Consider Pulmonary or PICU consult

CWK 6-6-2018
1. PAS should be done prior to treatment and repeated 15 minutes afterward (preferably by the same provider).
2. Add elements into a single score.
3. Document score in Epic flowsheet

<table>
<thead>
<tr>
<th>Element</th>
<th>Points</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>1. Respiratory Rate</strong></td>
<td></td>
<td></td>
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<tr>
<td>Obtain over 30 sec and multiple by 2.</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2-3 yrs</td>
<td>≤34</td>
<td>35-39</td>
<td>≥40</td>
</tr>
<tr>
<td>4-5 yrs</td>
<td>≤30</td>
<td>31-35</td>
<td>≥36</td>
</tr>
<tr>
<td>6-11 yrs</td>
<td>≤26</td>
<td>27-30</td>
<td>≥31</td>
</tr>
<tr>
<td>≥12 yrs</td>
<td>≤23</td>
<td>24-27</td>
<td>≥28</td>
</tr>
<tr>
<td><strong>2. Auscultation</strong></td>
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<tr>
<td>Auscultate anterior and posterior lung fields. Assess air entry and presence of wheezing.</td>
<td>No Wheezes</td>
<td>Expiratory Wheezes</td>
<td>Inspiratory &amp; expiratory wheezes OR diminished breath sounds</td>
</tr>
<tr>
<td><strong>3. Work of Breathing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assess for nasal flaring or retractions. (suprasternal, intercostal, subcostal)</td>
<td>≤1 sign</td>
<td>2 signs</td>
<td>≥3 signs</td>
</tr>
<tr>
<td><strong>4. Dyspnea</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>As developmentally appropriate. *If sleeping AND not showing physical signs of respiratory distress, score the patient 0 (zero) for this category.</td>
<td>Speaks full sentences, playful, AND takes PO well</td>
<td>Speaks partial sentences, short cry OR poor PO</td>
<td>Speaks short phrases, grunting, OR unable to take PO</td>
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<tr>
<td><strong>5. O₂ Requirement</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Do not take patients off supplemental oxygen to obtain score.</strong></td>
<td>≥92% on RA</td>
<td></td>
<td>Supplemental oxygen required to maintain saturations above 92%</td>
</tr>
</tbody>
</table>
Recommendations for Patients with Severe Refractory Asthma in the ED

**Indications/ Definition:**
PAS > 6 after completion of initial high dose albuterol treatment or worsening clinical symptoms after initial therapy, signs of impending respiratory failure (Inability to speak, altered mental status, intercostal retractions, worsening fatigue)

**Standard Therapies Initiated:** High dose albuterol, ipratropium, steroids, and supplemental oxygen and IV fluids if indicated, monitoring

**Maximum recommended dose of albuterol in 1 hour:** 40 mg

**Assess Resources and Call PICU for Admission and Consultation**

**Consider Obtaining Chest X-ray**

**Adjunct Therapies:**

**Strongest Evidence of Benefit:**
Magnesium sulfate (50 – 75 mg/kg/dose IV, as a single dose, max 2g – administer over 20 min)
Systemic beta-agonists:
- IV epinephrine (1:1000, 0.01mL/kg/dose IM/SC, max 0.3 mL),
- IV terbutaline (2-10 mcg/kg IV bolus over 20 min, then drip 0.1 mcg/kg/min IV (starting dose))

**Other Therapies to Consider:**
Ketamine
Heliox (80:20 – if no supplemental oxygen requirement – currently only available in the PICU)
Non-invasive Positive Pressure Ventilation (Should be initiated in the PICU)

**Intubation – Only Indicated for Apnea or Impending Arrest**