Inclusion criteria:
- Patients ≥ 2 years old with:
  - Known history of asthma or wheezing responsive to bronchodilators presenting to the ED with cough, wheeze, shortness of breath, or other symptoms of exacerbation OR
  - No known history of asthma but with clear wheezing on exam without other explanation (e.g. concern for foreign body, cystic fibrosis, other lung disease)

Triage considerations:
- If severe distress or altered mental status, assign triage level 1, room immediately
- If not critically ill, obtain standard vital signs and calculate Respiratory Assessment Score (RAS, see below)
- If RAS 1-3, triage level 3
  - Initiate Duoneb in triage, room promptly if possible
- If RAS 4-9, triage level 2 and initiate care as below.
- Acetaminophen if current fever and none given in 4 hours

RAS calculation: To calculate score, determine a point value for each row and add the total. Maximum is 3 points per row for a total of 9 points.

<table>
<thead>
<tr>
<th>Respiratory Rate</th>
<th>0 points</th>
<th>1 point</th>
<th>2 points</th>
<th>3 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1 yrs of age</td>
<td>≤45</td>
<td>46-55</td>
<td>56-60</td>
<td>≥60</td>
</tr>
<tr>
<td>2-3 yrs of age</td>
<td>≤40</td>
<td>41-45</td>
<td>46-60</td>
<td>≥60</td>
</tr>
<tr>
<td>3-6 yrs of age</td>
<td>≤30</td>
<td>31-45</td>
<td>46-60</td>
<td>≥60</td>
</tr>
<tr>
<td>7+ yrs of age</td>
<td>≤20</td>
<td>21-35</td>
<td>36-50</td>
<td>≥50</td>
</tr>
<tr>
<td>Retractions</td>
<td>None</td>
<td>ONE of the following:</td>
<td>TWO of the following:</td>
<td>THREE of the following:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subcostal</td>
<td>Intercostal</td>
<td>Subcostal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Intercostal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Substernal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Suprasternal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Supraclavicular</td>
</tr>
<tr>
<td>Auscultation</td>
<td>Normal breathing, no wheezing</td>
<td>End-expiratory wheeze only</td>
<td>Expiratory wheeze only (greater than end-expiratory wheeze)</td>
<td>Inspiratory and expiratory wheeze or diminished breath sounds</td>
</tr>
</tbody>
</table>


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Asthma
January 2017
Division of Pediatric Emergency Medicine
Medications/interventions:

RAS 0:
- Albuterol likely not indicated
- Consider steroid burst if multiple nebs given at home prior to ED visit

RAS 1-3
- Start single Duoneb in triage
- Further management per flow chart

RAS 4-6
- Start Duoneb x 3 in triage, give dexamethasone 0.6 mg/kg PO (max 16 mg)
- Further management per flow chart

RAS 7-9
- Start Duoneb x 3 in triage, give dexamethasone 0.6 mg/kg PO (max 16 mg)
- Further management per flow chart

Impending or actual respiratory failure
- Ketamine 1.5 mg/kg IV/IM
- Intubation

Other medication dosages:
- Normal saline bolus 20 ml/kg IV, max 1000 ml
- Continuous albuterol 0.5 mg/kg/hr, max 15 mg/hr
- Methylprednisolone (Solu-Medrol) 2 mg/kg IV bolus
- MgSO4 25-75 mg/kg, max 2g
- Epi-pen 0.3 mg IM for children ≥30 kg
- Epi-pen Jr. 0.15 mg IM for children 15-30 kg
- Acetaminophen 15 mg/kg PO/PR prn fever or pain
- Ibuprofen 10 mg/kg PO prn fever or pain
- Ondansetron ODT/IV, 2 mg for 8-15 kg, 4 mg ≥15 kg, prn nausea or vomiting
- Ketamine (low dose to prevent intubation) 1 mg/kg IV followed by 0.15 mg/kg/hour infusion

Laboratory studies:
- If critically ill, iStat CG8

Imaging:
- Consider CXR if:
  - First time wheezing (not always necessary)
  - Significant crackles or asymmetry persistent after therapy
  - Fever ≥102 without rhinorrhea or other viral symptoms

Consultations:
- Pediatric intensive care unit fellow or staff for PICU admits
- General pediatrics for floor admits
- Pulmonology for patients who follow with that service
Reassessments:
- Continuous pulse ox for all patients
- Continuous cardiorespiratory monitoring for patients with RAS 7-9
- VS q1h

Differential diagnosis:
- Asthma exacerbation
- Viral illness
- Bronchiolitis
- Pneumonia
- Foreign body aspiration
- Vocal cord dysfunction

Discharge or Admission criteria:
- See flow charts

Quality measures:
- Reassessments with RAS as indicated
- Steroids for all patients receiving 2 or more nebs

References:

Initial RAS 1-3

Start single Duoneb in triage

- MD H&P at any time
- O2 to keep pulse ox >92% for all patients

When complete, RN recheck RAS

0 or 1

≥2

- Give dex
- Then give 2 more Duonebs back to back

Wait 1 hour from start of neb #2

Go to 7-9 pathway

7-9

RN recheck RAS

0 or 1

2-6

Discharge Criteria
- RAS 0-1
- O2 saturation ≥93%
- PO intake acceptable
- No significant other medical or social concerns
- If dex given in ED, discharge with prescription for second dose after 24 hours

Give additional albuterol neb and admit to floor

Discharge without further intervention if meets all d/c criteria
- Consider dex if multiple nebs at home

STOP:
If severe decompensation at any time, notify MD to initiate 7-9 escalation or intubation
This includes:
- Pulse ox <88% with 100% O2
- Apnea
- Drowsy
- Confused
- Silent Chest
- Severe retractions

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This includes:
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- Apnea
- Drowsy
- Confused
- Silent Chest
- Severe retractions
**Initial RAS 7-9**

- Start Duoneb x 3 in triage, back to back
- Give PO Dex
- Notify MD
- MD H&P at any time
- O2 to keep pulse ox ≥92% for all patients

**30 minutes after start, RN recheck RAS**

- Go to 4-6 pathway

**Escalation:**

- Start Continuous albuterol
- Place IV
- Give:
  - NS Bolus
  - MgSO4
  - IV Solumedrol

**No IV access x 30 minutes**

- Give IM Epi-pen or Epi-pen Jr.
- Continue IV attempts
- Arrange PICU transfer

**Severe decompensation, apnea or respiratory failure**

- Ketamine (IM/IV)
- Intubate
- Transfer to PICU

**Arrange PICU transfer**

If delay, consider low dose ketamine, IM epi, terbutaline, other interventions while waiting.

If good response to initial interventions, may consider observation in the ED and admission to floor if ED attending feels patient is stable for q2h nebs.

**STOP:**

If severe decompensation at any time, notify MD to initiate 7-9 escalation or intubation

This includes:

- Pulse ox <88% with 100% O2
- Apnea
- Drowsy
- Confused
- Silent Chest
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**Asthma**

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