### Asthma v.1 Urgent Care/Emergency Department and Inpatient Management Care Guideline

#### Inclusion: Children 2 years or older with history of asthma, albuterol use or episodic symptoms of airflow obstruction with wheeze or recurrent cough. Exclusions: Children less than 2 years old, chronic illness (cystic fibrosis, cardiac disease, bronchiolitis, croup/stridor, aspiration or neuromuscular disorders)

### RESPIRATORY SCORE (RS)

<table>
<thead>
<tr>
<th>Variable</th>
<th>0 points</th>
<th>1 points</th>
<th>2 points</th>
<th>3 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>RR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;2 mo</td>
<td>≤90</td>
<td>61-69</td>
<td>≥70</td>
<td></td>
</tr>
<tr>
<td>2-12 mo</td>
<td>≤50</td>
<td>51-59</td>
<td>≥60</td>
<td></td>
</tr>
<tr>
<td>1-2 yr</td>
<td>≤40</td>
<td>41-44</td>
<td>≥45</td>
<td></td>
</tr>
<tr>
<td>2-3 yr</td>
<td>≤34</td>
<td>35-39</td>
<td>≥40</td>
<td></td>
</tr>
<tr>
<td>4-5 yr</td>
<td>≤30</td>
<td>31-35</td>
<td>≥36</td>
<td></td>
</tr>
<tr>
<td>6-12 yr</td>
<td>≤26</td>
<td>27-30</td>
<td>≥31</td>
<td></td>
</tr>
<tr>
<td>&gt;12 yr</td>
<td>≤23</td>
<td>24-27</td>
<td>≥28</td>
<td></td>
</tr>
<tr>
<td>Retractions</td>
<td>None</td>
<td>Subcostal or Intercostal</td>
<td>2 of the following: subcostal, intercostal, subternal OR nasal flaring (infant)</td>
<td>3 of the following: subcostal, intercostal, subternal, inspiratory, hyperinflation OR nasal flaring/head bobbing (infant)</td>
</tr>
<tr>
<td>Dypsnea</td>
<td>Normal feeding, no or decreased activity</td>
<td>1 of the following: difficulty feeding, decreased feeding, decreased activity</td>
<td>2 of the following: difficulty feeding, decreased feeding, decreased activity</td>
<td>Stops feeding, no or decreased activity, difficulty or confusion</td>
</tr>
<tr>
<td></td>
<td>Normal feeding, no or decreased activity</td>
<td>Decreased oxygen saturation or agitation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 of the following: decreased appetite, increased breathing after play, hyperactivity</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Auscultation</td>
<td>Normal breathing, no wheezing present</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 OR both</td>
</tr>
</tbody>
</table>

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**Asthma v1 Emergency Department and Inpatient Management Pathway**

For any questions regarding this pathway please contact: aarthi.subramani@multicare.org and sara.ahmed@multicare.org

Last update November, 2015

Next scheduled update: November, 2018
Urgent Care/Emergency Department Management

1st Hour (applicable to urgent care)

- **Score 1-5**
  - Albuterol MDI 8 puffs
  - Consider Decadron (0.6 mg/kg)

- **Score 6-12**
  - Albuterol MDI 8 puffs q 15 mins prn or Nebulized 20 mg/hr
  - Decadron (0.6 mg/kg)
  - Consider Atrovent

- **O2 Need?**
  - (RA saturation < 90)

Assess score at end of one hour

2nd Hour

- **Score 1-4**
  - No O2 need
  - Discharge home (reassessed at one hour)

- **Score 5-8**
  - Albuterol MDI 8 puffs q 15 mins or Nebulized 20 mg/hr
  - Decadron if not given
  - Atrovent 1.5 mg Neb
  - Consider Mg Sulfate

Assess score at end of two hours

3rd Hour

- **Score 1-4**
  - No O2 need
  - Discharge home (reassessed at two hours)

- **Score 5-8**
  - Albuterol Nebulized 20 mg/hr
  - Bed Request

ED Discharge Criteria

- Tolerating oral intake
- Appropriate education
- F/U plan in place

Discharge Instructions

- Albuterol q 4 until seen by PCP
- F/U in 24-48 hours
- Education
- See guideline for steroid dose

**Urgent Care (if not responding) transfer to an MHS Emergency Department**

- Score >/= 4 after one hour of therapy.
- Signs of clinical deterioration* or poor response to therapy

(Yellow color denotes overlap with urgent care management

*defined on next page

ED Discharge Criteria

- Tolerating oral intake
- Appropriate education
- F/U plan in place

Discharge Instructions

- Albuterol q 4 until seen by PCP
- F/U in 24-48 hours
- Education
- See guideline for steroid dose
Steroid Treatment:
- Decadron 0.6 mg/kg x 2d followed by 0.3 mg/kg for 3 additional days (longer courses as condition dictates)

Oxygen:
- Supplemental O2 to keep sat >90 awake and >88% sleeping
- Standard pulse ox unless on O2 or on high score pathway

Magnesium:
- 50 mg/kg IV over 20 minutes (max 2 grams). Give with NS 20 mL/kg.

Discharge Criteria:
- Education Complete
- Must have signed copy of Asthma Home Management Plan of Care (Asthma Action Plan)
- Must have follow up plan in place (24-48 hours)
- Clean air for kids referral
- Smoking Cessation
- Consider referral to pulmonology if: PICU, atypical form of asthma, immunotherapy candidate, despite adequate follow up still not controlled.

Signs of Clinical Deterioration:
- Decreased level of awareness, difficulty auscultating breath sounds, signs of dehydration

Transfer to PICU Criteria:
- Score >/=9 for 4 hours or more
- Clinical Deterioration: See above

PICU to Medical-Surgical Unit Transfer:
- On q2 albuterol
- Improving respiratory score

PICU discharge to home:
- If criteria per pathway are met

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Next scheduled update: November, 2018
# Title: Pediatric Asthma Urgent Care/Emergency Department and Inpatient Care Guideline

## Target Audience:
Ambulatory and Acute Care Clinicians who manage pediatric patients in either Urgent Care, Emergency Departments (ED) or Inpatient Settings. Any other care providers who wish to utilize this guideline.

## Disclaimer:
This care guideline is based upon the most recent available evidence at the time of publication and dissemination. We understand resources available and patients may vary between care locations and clinician judgment should to be used when applying this guideline to patient care.

## Scope/Patient Population:
**Inclusion:** Children 2 years or older with history of asthma, albuterol use or episodic symptoms of airflow obstruction with wheeze or recurrent cough.

**Exclusion:** Children less than 2 years old, chronic illness (cystic fibrosis, cardiac disease, bronchiolitis, croup/stridor, aspiration or neuromuscular disorders)

## Rationale:
There is currently a significant gap in knowledge as to whether we are following a standard approach to acute asthma management across MHS facilities. Using therapy based upon asthma scoring may lead to a more efficient and timely treatments which will lead to less variation in care. This decreased variation will possibly lead to a lower length of stay in the ED and hospital, less hospital admissions and increased customer experience.

## Objective
1. Improve process by decreasing variation in care delivered to asthmatics in emergency departments and the hospital setting.
2. Improve outcomes such as: length of stay in the ED, % of children admitted from the ED, and cost in terms of standardizing the medications administered.
3. Increase parental, family and referring provider satisfaction with care.

## Medications:

### Albuterol

1. Patients \(<=20\) kilograms:

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Last update November, 2015
Next scheduled update: November, 2018
**Asthma v.1 Urgent Care/Emergency Department and Inpatient Management Care Guideline**

| **a. Albuterol 5 mg/ml inhalation solution** |
| 1. Continuous=15 mg/hr inhalation  |
| 2. 5-10 mg inhalation depending on asthma score  |
| **b. 90 microgram oral inhaler=4-8 puffs depending on asthma score** |
| **c. Aerochamber with mask** |
| **2. Patients > 20 kilograms** |
| **a. Albuterol 5mg/ml inhalation solution** |
| 1. Continuous=20 mg/hr inhalation solution  |
| 2. 5-10 mg inhalation depending on asthma score  |
| **b. 90 microgram oral inhaler=4-8 puffs depending on asthma score** |
| **c. Aerochamber with mask** |

**Steroids**

1. Dexamethasone: 0.6 mg/kg (max 16mg) for 2 days and 0.3 mg/kg for 3 days (consider shorter course of 2 days in select patients with mild exacerbations and rapid improvement.
2. Methylprednisolone: Loading dose 2 mg/kg intravenous (max 60 mg). Skip loading dose if decadron already given. Otherwise 1 mg/kg q6-12 hours (for more severe exacerbation/severe status asthmaticus).

**Magnesium**

1. 50 mg/kg per dose intravenous (max dose 2 grams). No more than 2 doses in 24 hours.
   a. Exclude: <6 years old, systolic blood pressure < 25th%ile for age (height and sex), and/or underlying cardiac renal, pulmonary (other than asthma), neuromuscular disease.

**Ipatropium**

1. 1.5 mg total (do not exceed this in 24 hour period)

**Associated Policies:**

1. Magnesium Sulfate use in Acute Severe Asthma in Pediatric Patients on the Medical-Surgical Unit. MB department policy in C-360.

**Algorithm:** [link](#)

**EVIDENCE**

3. Kelly AM, Kerr D, Powell C. Is severity assessment after one hour of treatment better for predicting

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Last update November, 2015

Next scheduled update: November, 2018
| 2  | Gorelick M, Scribano PV, Stevens MW, Schultz T, Shults J. Predicting need for hospitalization in acute pediatric asthma. Pediatric Emergency Care. 2008;24(11):735-44 |
| 6  | Sole D, Komatsu, MK, Carvalho, KV, Naspitz CK. Pulse oximetry in the evaluation of the severity of acute asthma and/or wheezing in children. J Asthma. 1999;36(4):327-33 |
| 8  | Wright RO, Santucci KA, Jay GD, Steele DW. Evaluation of pre- and posttreatment pulse oximetry in acute childhood asthma. Acad Emerg Med. 1997;4(2):114-7 |
| 9  | Boychuk RB, Yamamoto LG, DeMesa CJ, KiyabuKM. Correlation of initial emergency department pulse oximetry values in asthma severity classes(steps) with the risk of hospitalization. Am J Emerg Med. 2006;24(1):48-52 |
| 13 | Mason N, Roberts N, Yard N, Partridge MR. Nebulisers or spacers for the administration of bronchodilators to those with asthma attending emergency departments? Respir Med. 2008;102(7):993-8 |
| 18 | Gorelick MH, Stevens MW, Schultz TR, Scribano PV. Performance of a novel clinical score, the Pediatric Asthma Severity Score (PASS), in the evaluation of acute asthma. Acad Emerg Med. 2004;11(1):10-8 |
Asthma v.1 Urgent Care/Emergency Department and Inpatient Management Care Guideline


List of Implementation Items and Patient Education:

1. EPIC Order Set-Complete
2. Education (RT driven): Involves using an asthma book as a guide for parents. Education is starting on admission through discharge and demonstration of understanding is confirmed. An asthma control test is performed. In addition smoking cessation and a referral to clean air for kids is made. CPR review available upon family demand. A patient education link, see below, will be added to standard discharge instructions in 2016.
3. Pediatric Data Application (Health Catalyst in process)

Metrics Plan:
1. ED and Medical Surgical Unit asthma order set compliance by Jan 1, 2016: Meets=75%, Exceeds=90%
2. ED Time to Steroid order within one hour of arrival, by the end of 2016: 60% meets, 75% exceeds. Will
monitor time to steroid administration as well. Additionally look at admit rate from ED in 2015 in comparison to 2016.

3. Overall LOS. To continue to have an LOS (O/E) that is either the same or less than our peer comparator by the end of 2016. Currently 0.81 (equivalent).

4. Mg related adverse event rate for patients who receive Mg on the medical-surgical unit.

**PDCA Plan:**

Will begin using the order set in Jan, 2016. Will adjust based upon feedback from physicians who are involved in order entry or through cost opportunities.

1. **IPS:** Aarthi Subramani, MD
2. **ED:** Sara Ahmed, MD

**Additional CME credit (Dr. Tom Hurt):**

**CBL:** Life Threatening Asthma* [http://www.multicare.org/photos/Education/PEMA/asthma/](http://www.multicare.org/photos/Education/PEMA/asthma/)

*The asthma ED pathway in this CBL is an old version and will be updated please refer to the ED pathway above.

**Patient Education:** Videos for kids with asthma introduce asthma symptoms, medications, pathophysiology, emergencies, and triggers.


**Point of Contact:** IPS MD (Aarthi Subramani), ED MD (Sara Ahmed) and RT Manager (Mary Dearth)

**Approval By:**

Medical Staff Committee(s)

Quality Steering Council

**Date of Approval:**

1. 12/9/2015: Hospital Practice Committee (Medical-Surgical Standardization Workgroup-Pediatric Collaborative Workgroup)
2. 12/21/2015: Pediatric Collaborative

**Original Date:** 12/9/2015

**Revision Dates:** X/XX; X/XX

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<table>
<thead>
<tr>
<th>Reviewed with no Changes Dates:</th>
<th>X/XX; X/XX</th>
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Distribution: MHS Intranet/MCC Website/MB Website

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