# Asthma – Inpatient Care Guideline

**Inclusion Criteria:**
- Status asthmaticus
- RAS score ≤ 7
- $FiO_2$ less than 50%

**Exclusion Criteria:**
- First time wheezing/WARI (Wheezing Associated Respiratory Illness) diagnosis
- Patient requiring PICU
- Cystic Fibrosis
- Chronic Lung Disease
- Primary diagnosis of Bronchiolitis, Pneumonia, Croup
- Airway issues (tracheostomy, tracheomalacia, etc.)

**Criteria for PICU Status**

Remove patient from *Inpatient* Guideline
- HFNC $FiO_2$ > 50% or RAS ≥ 8
- Need for q1h or continuous albuterol
- Need for Terbutaline drip
- Heliox administered in ED
- If repeated doses of parenteral epinephrine or magnesium sulfate given in ED
- An inappropriate $pCO_2$ by ABG or CBG
- Requires a nonrebreather mask for $O_2$
- Signs or symptoms of impending respiratory failure
- Presence of a pulsus paradoxus
- Change in mental status

**Care per CHOC ED or Outside Hospital (OSH) ED**
- Patient is accepted for admission to acute care; complete H&P.
- Determine asthma severity by history.
- Vital signs; RAS scoring prior to next bronchodilator administration.

**Recommendations / Considerations**
- Chest x-ray (CXR) is not indicated.
  - Consider if fevers > 39°C, chest pain, severe distress or severe hypoxia.
- Viral testing is not indicated.
- Avoid initiation of long-acting beta-2 agonists, or leukotriene inhibitors as monotherapy.
- Levalbuterol (Xopenex) could be used as alternative to albuterol in patients with adverse reaction to albuterol or strong parent preference.

## Interventions

### Steroids

**Dexamethasone (PO/IM)**
- Consider this if patient received first dose in the ED, and patient is currently nontoxic appearing, on low flow oxygen, and can be spaced to q4.
- 2 dose total regimen.
- 0.6 mg/kg (max 16 mg), once at the onset of illness, and second dose 24-36 hours after first dose.

**Prednisone (tablets) / Prednisolone (liquid) (PO)**
- Day 1 - Loading Dose
  - 2 mg/kg PO ***once*** (max 60 mg)
- Days 2-5 – Maintenance Dosing
  - 1 mg/kg PO BID x 4 days (max 30 mg per dose).

**Methylprednisone (IV)**
- Consider this for patient who is ill appearing, on High-flow Nasal Cannula (HFNC), or is worsening.
- 0.5-1 mg/kg/dose q6h (max 60 mg per dose).
- Add IV famotidine for all patients receiving methylprednisone.

### Bronchodilators
- Follow RAS scoring to wean albuterol from q2 to q4 (see page 2).
- Refer to escalation pathway on page 2.

### Adjunctive Therapies
Consider:
- Fluid bolus
- Magnesium sulfate 75 mg/kg (max dose 2 gm), IV, one time only.
- Ipratropium (Atrovent) 500 mcg nebulized q6h in conjunction with albuterol for patients with severe respiratory distress.
- For patients on HFNC, encourage PO hydration, or consider supplemental fluids via NG tube or IV route.
- Pulmonology consult for moderate to severe persistent asthma or patients that require PICU during this hospital course.
- Oxygen as needed to maintain $SpO_2$ > 90%.
- Begin discharge planning, asthma teaching, and asthma action plan.

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Reassess the appropriateness of Care Guidelines as condition changes and 24 hrs after admission. This guideline is a tool to aid clinical decision making. It is not a standard of care. The physician should deviate from the guideline when clinical judgment so indicates.



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# Asthma – Inpatient Care Guideline

| Respiratory Assessment Scoring (RAS) Tool | | | | |
|---|---|---|---|---|
| **Score** | **0** | **1** | **2** | **3** |
| **Respiratory Rate**<br>Neonates (0-1 mo)<br>Infant (1 mo-1 yr)<br>Toddler (1-4 yr)<br>Child (5-11 yr)<br>Adolescent (12+) | <br>30-60<br>30-50<br>20-30<br>18-25<br>12-20 | <br>61-69<br>51-60<br>31-40<br>26-30<br>21-25 | <br>70-79<br>61-79<br>41-59<br>31-35<br>26-30 | <br>≥ 80<br>≥ 80<br>≥ 60<br>> 35<br>> 30 |
| **Respiratory Distress** | No distress | **1 of the following:** Subcostal, intercostal, suprasternal, substernal retractions; or nasal flaring | **2 of the following:** Subcostal, intercostal, suprasternal, substernal retractions; or nasal flaring | **3 of the following:** Subcostal, intercostal, suprasternal, substernal retractions; or nasal flaring<br>*Any* head bobbing |
| **Breath Sounds** | ***Good*** Good aeration and clear breath sounds | ***Good & Wheezing*** Good aeration with inspiratory and/or expiratory wheeze | ***Fair*** Fair aerations with/ without inspiratory or expiratory wheezing | ***Diminished*** Diminished/Absent aeration with/without inspiratory/expiratory wheeze |
| **Oxygen Requirement** | Room Air | | Low $FiO_2$ / Flow ≤ 4L/min nasal cannula | High $FiO_2$ / Flow > 4L/min nasal cannula or HFNC |

**Admit to Acute Care**

- RAS is ≤ 7 and/or $FiO_2$ requirement is equal to or less than 0.50.
- If RAS ≥ 8 increase frequency of treatments, transfer to PICU if in acute care and consider initiation of adjunct therapies.

*If patient has change in mental status, cyanosis, increased distress, or absent breath sounds, notify physician immediately and/or call a PICU Response.*

**Criteria for PICU Status**

Remove patient from *Inpatient* Guideline

- HFNC $FiO_2$ > 50% or RAS ≥ 8
- Need for q1h or continuous albuterol
- Need for Terbutaline drip
- Heliox administered in ED
- If repeated doses of parenteral epinephrine or magnesium sulfate given in ED
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- Requires a nonrebreather mask for $O_2$
- Signs or symptoms of impending respiratory failure
- Presence of a pulsus paradoxus
- Change in mental status

- **RAS should be performed pre-treatment to determine frequency and dose**
- **Every patient should receive at least one treatment at every frequency**

## RAS ≤ 4

### Q4h MDI

**Dosages:**

- First q4 hour dose
  - > 20 kg: 8 puffs
  - 10-20 kg: 6 puffs
  - 5-10 kg: 4 puffs
- Subsequent q4 hour dose (Home Dose)
  - > 20 kg: 2 puffs
  - 10-20 kg: 2 puffs
  - 5-10 kg: 2 puffs

➢ If above is tolerated, consider PRN

**Patient and Family Education**

**RTs**

- Teach breathing treatment delivery.
- Guide parents/patients with MDI use.
- Confirm understanding of medication delivery.

**RNs**

- Verify patient/parent knowledge of medications and Asthma Action Plan (AAP) through teach-back.

**Medical Staff**

- Review AAP with patient/parents, ensure understanding and complete in Electronic Health Record (EHR).

## RAS 5 - 7

### Q2h MDI

**Dosages:**

- > 20 kg: 8 puffs q2 hours
- 10-20 kg: 6 puffs q2 hours
- 5-10 kg: 4 puffs q2 hours

***If RAS increases by ≥ 2 or unable to wean within 12hrs***

- Call provider for assessment
- Consider HFNC
- Consider PICU Response

**Patient and Family Education**

**RTs**

- Teach breathing treatment delivery.
- Guide parents/patients with MDI use.
- Confirm understanding of medication delivery.

**RNs**

- Verify patient/parent knowledge of medications and Asthma Action Plan (AAP) through teach-back.

**Medical Staff**

- Review AAP with patient/parents, ensure understanding and complete in Electronic Health Record (EHR).

## RAS ≥ 8

- Transfer to PICU, and remove from *Inpatient* Guideline

***Or***

- If the patient remains on the acute care unit, make the patient a 'Watcher'.

**Continuous Albuterol**

**Dosages:**

- > 20 kg:15 mg/hr
- > 10-20 kg: 11.25 mg/hr
- 5-10kg: 7.5 mg/hr

***Note:*** Max Dose: 20mg/hr

***If RAS continues to increase by ≥ 2 or unable to wean within 12hrs***

- Notify physician of need for assessment *and/or* call PICU Response.

**Consider:**

- Fluid bolus
- Magnesium Sulfate
- Increase albuterol dose
- Epinephrine IM

**Discharge Planning**

- Initiate/Consider controller medication.
- Initiate discharge planning (i.e. order medication/supplies, home need, PCP communication)

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**Formal Asthma Education ordered for:**

- First time asthma diagnosis
- First time treated at CHOC

***Note:*** Formal Asthma Education can begin at discretion of the Attending or Pulmonary team.

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**Does patient meet discharge criteria?**

- Oxygen requirements return to baseline.
- Patient tolerates two q4h treatments.
- Discharge Asthma Education (as applicable) complete and documented.
- Asthma Action Plan completed.
- Follow-up appointment arranged.

## *Asthma – Inpatient Care Guideline*
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