Asthma Clinical Practice Guideline: Emergency Department Management

Inclusion: ≥ 18 months old, presents with asthma symptoms, otherwise healthy, in acute asthma exacerbation

- Presents with asthma symptoms: wheezing, cough, SOB, increased WOB

**Initiate Caregiver Initiated Protocol (CIP)**
- Place on oxygen for SpO₂ <90%
- Obtain Baseline CRS

**CRS Score and Assessment**
- Clinically Improved?
  - 4 puffs of Albuterol MDI
  - Repeat CRS 15 min post treatment

**CRS 0-2**
- 6 puffs of Albuterol MDI
- Repeat CRS post treatment

**CRS 3-5**
- Albuterol via continuous nebulizer with 1 mg Ipratropium Bromide
- Give steroids x1 dose
- Continuous HR and SpO₂ monitoring
- Repeat CRS 45-60 min post treatment

**CRS 6-8**
- Albuterol via continuous nebulizer with 1 mg Ipratropium Bromide
- Give steroids x1 dose
- Continuous HR and SpO₂ monitoring
- Repeat CRS 30 min post treatment

**Off CIP - Physician Only:**
- Consider Budesonide via nebulizer
- Contact Budesonide via nebulizer
- Make NPO
- Reassess CRS 30 min post treatment

**CRS >9**
- Albuterol via continuous nebulizer
- Consider Heliox
- Consider HFNC/NPPV
- Consider IV fluids
- Consider Ketamine IV
- Consider blood gas
- Reassess CRS improving, continue to monitor and reassess in 30 minutes

**Discharge Criteria**
- Admit to Hospital
- Continue Albuterol via intermittent nebulizer Q2 hours as appropriate for patient condition
- Ongoing reassessment-CRS Q1 hour

**Definitions**
- CRS: Clinical Respiratory Score
- MDI: Metered Dose Inhaler
- HFNC: High Flow Nasal Cannula
- NPPV: Non-invasive Positive Pressure (BiPAP/CPAP)
- PEP: Positive Expiratory Pressure

Literature shows CXR is not routinely indicated in the care of acute asthma exacerbation.

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### Medications

#### Respiratory Medications

**Albuterol Metered Dose Inhaler (MDI):** 90 mcg/puff  
- 4-6 puffs with spacer per guideline

**Albuterol via continuous nebulizer:**  
- <15 kg: 7.5 mg/hr  
- ≥15 kg: use 15 mg/hr

**Albuterol via Intermittent PEP nebulizer:**  
- <15 kg: 2.5 mg Albuterol and 5 cm H₂O  
- 15-18 kg: 5 mg Albuterol and 8 cm H₂O  
- 18-25 kg: 5 mg Albuterol and 10 cm H₂O  
- ≥25 kg: 5 mg Albuterol and 12 cm H₂O

**Ipratropium Bromide:**  
- 1 mg via continuous nebulizer, given over one hour

**Budesonide 1.5 mg via continuous nebulizer, given over one hour**

#### Steroid Dosing

**Dexamethasone:** 0.6 mg/kg PO (Max dose 16 mg)  
- <12 kg: *Per physician discretion only. Consider Dexamethasone 4 mg QD or Prednisolone 1-2 mg/kg/day (QD or BID)**  
- 12 to <15 kg: 8 mg (packet of 2 tablets)  
- 15 to <25 kg: 12 mg (packet of 3 tablets)  
- ≥25 kg: 16 mg (packet of 4 tablets)  
  - Do not give if patient had in past 24 hours  
  - Give steroids PO unless patient is vomiting  
  - Consider steroid taper if patient had 2 courses of steroids in past 60 days

**Dexamethasone IM Dosing:** 0.6 mg/kg (Max dose 16 mg)  
- Methylprednisolone IV: 2 mg/kg x1 (Max dose 60 mg) if CRS >9 or not tolerating PO

#### Additional Medications (CRS > 6)

**Magnesium Sulfate** 50 mg/kg IV over 20 min (Max dose 2 grams)  
- Ketamine 0.5-1 mg/kg IV x1; continuous infusion 0.3mg/kg/hr

### Discharge

#### 2 Discharge Criteria

**Risk Screen:** (Consider Observation and/or discussion with PCP/Specialist)  
- Hospitalized two or more times in past 6 months, history of ICU/intubation  
- ≥3 ED visits in past 6 months  
- 2 or more canisters of Albuterol in past 6 months  
- Failed outpatient therapy (already on Q4 nebs or oral steroids >48 hours)  
- Direct exposure to tobacco smoke

**Consider Subspecialty Referral if:**  
- Hospitalized two or more times in past year  
- ≥3 ED visits in past 12 months  
- 2 or more courses of oral steroids in past 2 months  
- 2 or more canisters of Albuterol in past 6 months

#### 3 Discharge Orders

**Follow up with PCP/ Subspecialist**  
- Education (watch asthma video if given continuous treatment)  
- Asthma Management Plan (Asthma Basics)

**Discharge Medications:**  
- Albuterol MDI with spacer  
  - 4 puffs QID for 2 days and Q4 hours PRN cough/wheeze  
- Inhaled steroids  
  - Fluticasone propionate (Flovent) 44 mcg/puff - 2 puffs BID x1 canister (no refills) (For patients <12 years old)  
  - Budesonide (Pulmicort respules) 0.5mg/2ml inhalation solution- BID via nebulizer  
  - Fluticasone furoate (Arunyti Ellipta) 100 mcg/activation-1 puff daily (For patients ≥12 years old)  
- Oral Steroid: Dexamethasone PO x1 24 hours after first dose  
  - <12 kg: Provide prescription for Dexamethasone 4 mg x1 or Prednisolone 1-2 mg/kg/day (QD or BID) for 3-5 days  
  - 12 to <15 kg: dispense 8 mg (packet of 2 tablets)  
  - 15 to <25 kg: dispense 12 mg (packet of 3 tablets)  
  - ≥25 kg: dispense 16 mg (packet of 4 tablets)  
  - Consider steroid taper if patient had 2 courses of steroids in past 60 days

#### 4 Admission Criteria

**Consider admission to the hospital if:**  
- CRS ≥ 4 despite 2nd hour of treatment (*including trial of Ipratropium Bromide if not contraindicated*)  
- O2 requirement to keep SpO₂ > 90%  
- Failed outpatient treatment ≥2 days

**Consider PICU if:**  
- Acute Respiratory Failure  
- CRS>9  
- FiO₂ ≥50%  
- Initiation of NPPV/ HFNC  
  - (see *High Flow Guidelines*)  
- PEWS ≥5 (after ED care team discussion)