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

Caregiver Initiated Protocol
- Begin Albuterol via continuous nebulizer with 1 mg Ipratropium Bromide and give 1.5 mg Budesonide via nebulizer
- Establish IV access
- Continuous HR and SpO₂ monitoring
- Use heated/humidified oxygen between aerosols
- Make NPO
- Contact provider for further orders

Off CIP - Physician Only
- Give steroids¹
- Give Magnesium Sulfate IV
- Consider Heliox
- Consider HFNC/NPPV
- Consider IV fluids
- Consider Ketamine IV
- Consider blood gas
- Reassess CRS 30 min post treatment

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

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CRS >9
- Albuterol via continuous nebulizer
- Consider Heliox
- Consider HFNC/NPPV
- Establish IV access
- Give Magnesium Sulfate, if not already given
- Start maintenance IV fluids or fluid bolus
- Make NPO
- If CRS improving, continue to monitor and reassess in 30 minutes

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

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**Discharge Risk Assessment**

**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

**Discharge Criteria**

**2 Discharge Criteria**
- CRS ≤ 3
- Easy work of breathing with good air exchange
- SpO₂ > 90% on room air consistently
- Able to maintain O₂ sat, RR, WOB during feeding/activity
- Family verbalizes ability to manage patient at home

**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 (Arnuity Ellipta) 100 mcg/actuation-1 puff daily (For patients ≥12 years old)
- Oral Steroid: Dexamethasone PO x1 24 hours after first dose
  - 1 mg/kg (Max dose 16 mg)
- 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

**Discharge Orders**

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

**Consider PICU if:**
- Acute Respiratory Failure
- CRS > 9
- FiO₂ ≥ 50%
- Initiation of NPPV/ HFNC (see campus HFNC Guidelines: Scottish Rite, Egleston/Hughes Spalding)
- PEWS ≥ 5 (after ED care team discussion)

**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

**Adjunct Therapies**
- May consider **Ipratropium Bromide 0.5 mg** for cough (if not already given)
- **Epinephrine** (Concentration 1mg/mL) 0.01 mg/kg IM (Max dose 0.5 mg)
- **Terbutaline:** 0.005-0.01 mg/kg SQ
- End Tidal CO₂ monitoring

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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 use 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

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**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
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**Discharge**

- **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

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**Emergency Department Management**

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