Asthma Clinical Practice Guideline: Emergency Department Management

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

Present 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

Purple shaded area represents CAREGIVER INITIATED PROTOCOL FOR ASTHMA #5-24

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

CRS ≥9
- Albuterol via continuous nebulizer
- Consider Heliox
- Consider HFNC/NPPV
- Consider IV fluids
- Consider Ketamine IV
- Consider blood gas
- Reassess CRS 30 min post treatment

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

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 Medications:
- Albuterol MDI with spacer
  - 4 puffs QID for 2 days then 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
  - <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 16 mg (packet of 4 tablets)
  - ≥15 kg: dispense 25 mg Albuterol and 10 cm H2O
  - 15-18 kg: 2.5 mg Albuterol and 5 cm H2O
  - 18-25 kg: 5 mg Albuterol and 10 cm H2O
  - >25 kg: 5 mg Albuterol and 12 cm H2O

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

Discharge

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

3 Discharge Orders
- Follow up with PCP/ Subspecialist
- Education (watch asthma video if given continuous treatment)
- Asthma Management Plan (Asthma Basics)
- Albuterol MDI with spacer
- Discharge Medications:
- Oral Steroid: Dexamethasone PO x1 24 hours after first dose
- Inhaled steroids
- Fluticasone propionate (Flovent) 44 mcg/puff - 2 puffs BID x1 canister (no refills) (For patients <12 years old)
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- 12 to <15 kg: dispense 16 mg (packet of 2 tablets)
- ≥15 kg: dispense 25 mg Albuterol and 10 cm H2O

Admission Criteria

1 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

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)

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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