Asthma Exacerbation: Emergency Department

Children's Mercy KANSAS CITY | Evidence Based Practice

QR code for mobile access

Pt > 2 years of age in the emergency department with signs and symptoms of asthma exacerbation

Is there impending/actual respiratory failure?

Yes →

In addition to severe therapies below, consider:
- ***Epinephrine:***
  - *For Adele Hall ED*
    - 1 mg/mL solution, 0.01 mg/kg IM
  - *For CM Kansas ED*
    - 7.5 to < 25 kg: 0.15 mg/0.3 mL (1:2000) IM (EpiPen Jr)
    - ≥ 25 kg: 0.3mg/0.3 mL (1:1000) IM (EpiPen)
- ***Continuous*** positive airway pressure
- ***Non-invasive*** positive airway pressure ***-or-*** endotracheal intubation

No ↓

Is the exacerbation mild, moderate, or severe?

Mild ← | Moderate ↓ | → Severe

Mild
- ***Initiate*** oxygen to achieve SpO_2 ≥ 90%
- ***Administer***:
  - Albuterol (MDI with spacer)
    < 20 kg: 4 puffs
    ≥ 20 kg: 8 puffs

-and-
- ***Consider*** systemic steroid if ≥ 2 albuterol treatments are required:
  - Dexamethasone (Link to Evidence)
    0.6 mg/kg PO x1 dose (Max: 12 mg)
    -or-
  - Prednisolone/Prednisone
    2 mg/kg/day PO x3-5 days (Max: 60 mg/day)

Moderate
- ***Initiate*** oxygen to achieve SpO_2 ≥ 90%
- ***Administer:***
  - Dexamethasone (Link to Evidence)
    0.6 mg/kg PO x1 dose (Max: 12 mg)
    (2nd dose on day 2 may be considered)
    -or-
  - Prednisolone/Prednisone
    2 mg/kg/day PO x3-5 days (Max: 60 mg/day)

-and-
- Albuterol (MDI with spacer)
  < 20 kg: 4 puffs
  ≥ 20 kg: 8 puffs
  -or-
- Continuous Albuterol (nebulized)
  < 20 kg: 10 mg/hr
  ≥ 20 kg: 15 mg/hr

- ***Consider*** (if not already administered)
  - Magnesium sulfate
    50 mg/kg IV (Max dose: 2 grams)
  - Ipratropium bromide (nebulized) 1500 mcg x1 during first hour *of* continuous Albuterol

Severe
- ***Initiate*** oxygen to achieve SpO_2 ≥ 90%
- ***Place*** IV
- ***Start*** NS fluid bolus 20 mL/kg (Max first bolus of 1L. If more is needed, monitor lung exam closely for signs of volume overload.)
- ***Administer***
  - Methylprednisolone
    2 mg/kg IV q24 hrs ***-or-*** divided q12 hrs (Max: 60 mg/day)

-and-
- Continuous Albuterol (nebulized)
  < 20 kg: 10mg/hr
  ≥ 20 kg: 15 mg/hr
  -with-
  - Ipratropium bromide (nebulized) 1500 mcg x1 during first hour *of* continuous Albuterol

Provide (If not already administered):
- Magnesium sulfate
  50 mg/kg IV (Max dose: 2 grams)

Review indications for transfer to intensive care

↓

Assess response to treatment

↓

Does the pt meet discharge criteria?

Yes → Discharge with home asthma care and PCP follow-up

No ↓

- ***Continue*** care as above
- ***Recommend*** (if not already administered):
  - Corticosteroid (oral, IV, or IM)
  - Ipratropium bromide (nebulized)
  - Magnesium sulfate IV
- Disposition may depend on numerous patient-level factors, but the need for admission should be considered if the patient requires ≥ 3 hours of continuous albuterol

↓

Does the pt meet discharge criteria?

Yes → Discharge with home asthma care and PCP follow-up

No →
- ***Admit*** to Gen Peds or PICU
  Review indications for transfer to intensive care
  Inpatient algorithm
- ***Continue*** ED care and reassessments until transfer

Albuterol Dosing:
- Continuous albuterol alone: 0.083% (2.5 mg / 3 mL)
- If combined with ipratropium 0.5% solution (0.5 mL = 2.5 mg)

Intensive Care Indications
Any of the following:
- Prolonged continuous albuterol for > 4 hrs with worsening symptoms
- Inadequate ventilation with hypercapnea (PCO_2 on capillary blood gas > 45)
- Need for high flow nasal cannula or non-invasive ventilation due to concern for respiratory failure
- Persistent hypoxemia (SpO_2 < 90%) despite supplemental O_2 (≥ 3 L/min or > 40% FiO_2 with non-rebreather)
- Altered level of consciousness (drowsiness)

Discharge Criteria
All of the following:
- Resolution of respiratory distress
- Resolution of hypoxemia (SpO_2 ≥ 90% on room air)
- Do not anticipate albuterol will be needed more frequently than q4 hours
- Ability of caregiver to provide q4h albuterol at home

Discharge Checklist
- ***Continue*** yellow zone therapies on discharge
- ***Determine*** systemic steroid plan based on initial steroid administered and patient needs
- ***Consider*** "stepping up" green zone therapies if indicated
- ***Provide*** Asthma Action Plan and asthma education
- ***Recommend*** appropriate follow-up with either PCP or Asthma Provider
- ***Confirm*** pt has access to prescribed medications within 2-3 hours after discharge

Other Resources
- Asthma Reference Guide
- Caregiver Smoking Cessation