

Acute Asthma Exacerbations

- Age: > 24 months of age
- H/o asthma, reactive airway disease or wheezing +/- family history of asthma

- Contraindication/allergy to medications used within guideline
- Disease of other origin: pneumonia, bronchiolitis, croup
- Complicated medical history, including congenital/acquired heart disease, chronic lung disease/bronchopulmonary dysplasia/cystic fibrosis, immune mediated disorders, tracheostomy

- No absolute indication
- Consider radiographic imaging in children with fever > 39°C, hypoxia, focal abnormality on pulmonary examination, absence of family history of asthma, or those who respond less favorably than expected to bronchodilator therapy. May also be considered in patients with concern for presence of foreign body, pneumomediastinum or pneumothorax.
- Consider blood gas testing if there is a clinical worsening of mental status, neurologic and/or respiratory exam.

- MPASS† ≤ 7
- Able to obtain/tolerate medicine and manage outpatient asthma

- * Albuterol:
 - < 20 kg (2.5 mg)
 - > 20 kg (5 mg)
- Ipratropium:
 - < 20 kg (250 mcg)
 - > 20 kg (500 mcg)
- Above dosing reference pertains to one-time nebulized treatments

*** Continuous Albuterol:
20 mg/hr

```

graph TD
    Start([Start]) --> Monitor{Nursing performs MPASS†}
    Monitor --> MonitorBox[Place on cardiorespiratory monitor, obtain vital signs, give supplemental oxygen to maintain PO2 > 92%]
    Monitor --> Impending{Impending respiratory failure?}
    Impending -- YES --> Off[Off algorithm]
    Monitor --> Mild[MPASS† 1-5 (MILD)]
    Monitor --> Moderate[MPASS† 6-10 (MODERATE)]
    Monitor --> Severe[MPASS† 11-15 (SEVERE)]

    Mild --> MildTx[Albuterol neb x 1*  
OR  
Albuterol MDI/spacer  
4-8 puffs x 1]
    MildTx --> MildReass{Reassessment/  
MPASS†}
    MildReass -- YES --> MildDischarge[Meets discharge criteria?]
    MildDischarge -- YES --> MildDischargeBox[Discharge home  
■ Albuterol +/- aerosolizer: 4 puffs Q4H x 48h as per attending decision  
■ Consider repeat dose of Dexamethasone in 24 hours if given initially  
■ Follow-up in 2 days with PCP if desired]
    MildDischarge -- NO --> MildReass
    MildReass -- NO --> ModerateTx

    ModerateTx[Albuterol/Ipratropium* q20 min x 3**  
AND  
Dexamethasone 0.6 mg/kg (max 12-16 mg) PO/IM x 1] --> ModerateReass{Reassessment/  
MPASS†}
    ModerateReass -- IMPROVED --> ModerateObserve[Observe for 90-120 minutes to determine further therapy needs  
■ Repeat MPASS†  
■ Assess discharge criteria]
    ModerateObserve --> ModerateDischarge{Requires further therapy?}
    ModerateDischarge -- NO --> MildDischargeBox
    ModerateDischarge -- YES --> ModerateAdmissionBox[Consider admission  
■ Call RT  
■ Consider continuous albuterol***  
■ Consider IV access  
■ Consider adjunctive therapy]

    Severe --> SevereTx[Immediately start:  
■ Albuterol/ipratropium* q20 min x 3**  
■ Call respiratory therapy (RT), consider IV access AND  
■ Dexamethasone 0.6 mg/kg (max. 12-16 mg) PO/IM/IV x 1 OR  
■ Methylprednisolone 2 mg/kg (max 60 mg) IV x 1]
    SevereTx --> SevereAdj[Consider adjunctive therapy:  
■ Magnesium Sulfate 50 mg/kg IV x 1 (max 2 g)  
■ Epinephrine 1:1,000 (1 mg/mL), 0.01 mg/kg IM (max 0.3-0.5 mg)  
■ Terbutaline loading dose: 10 mcg/kg IV/IM x 1, then infusion of 0.08 mcg/kg/min IV; titrate to effect]
    SevereAdj --> SevereReass{Reassessment/  
MPASS†}
    SevereReass -- NOT IMPROVED --> SevereAdmissionBox
    SevereReass -- IMPROVED --> ModerateObserve
  
```

† Modified Pediatric Asthma Severity Score (MPASS) - full scale on page 3

† Modified Pediatric Asthma Severity Score (MPASS) - full scale on page 3

Modified Pediatric Asthma Severity Score (MPASS)

	0	1	2	3
Oxygenation	> 98% on RA	95% - 97% in RA	90% - 94% on RA	< 90% on RA
Auscultation	No wheezing Normal breath sounds	End expiratory wheezes	Inspiratory and expiratory wheezes	Wheezing audible without stethoscope or silent chest
Retractions	No retractions	Intercostal retractions and/or diaphragmatic (belly) breathing	Two of the following: <ul style="list-style-type: none"> ■ Intercostal ■ Suprasternal ■ Diaphragmatic (belly) breathing ■ Nasal flaring (infant) 	Three of the following: <ul style="list-style-type: none"> ■ Subcostal ■ Intercostal ■ Substernal ■ Supraclavicular ■ Nasal flaring or head bobbing (infant)
Dyspnea	Absent dyspnea; speaks in complete sentences; alert; playful	Normal activity and speech. Some dyspnea, irritable, coughing after play	Decreased activity. 5- to 8-word sentences. Moderate dyspnea; not sleeping or eating; coughing after play	Not speaking. Severe dyspnea; grunting; lethargic, stops playing
Respiratory Rate				
Infant (birth - 1 yr)	< 60	60-80	81-99	≥ 100
Toddler (>1-3 yrs)	< 40	40-60	61-79	≥ 80
Preschool (>3-6 yrs)	< 30	30-40	41-59	≥ 60
School Age (> 6-12 yrs)	< 20	20-26	27-30	≥ 31
Adolescent (> 12-18 yrs)	< 18	18-23	24-27	≥ 28
Severity Scores	0	1-5 MILD	6-10 MODERATE	11-15 SEVERE

Approved: 1/2016 – Asthma Education Committee

MPASS has not been validated for use in the emergency department but is widely used for assessing asthma severity in UCSF Benioff Children's Hospitals.