

# ASTHMA CLINICAL PRACTICE GUIDELINES

## INITIAL CARE

### Assess ABCs

- Airway
- Breathing
- Circulation

### Initial Triage Options

- Emergency Department or Outpatient Management
- Admission to Inpatient Unit
- Stabilize and transfer emergently to PICU based on clinical judgment and factors such as:
  - Intubation, or severe compromise in patient previously intubated for asthma
  - Worsening on maximal medical therapy
  - Evidence for impending respiratory failure
  - Complex co-existing or co-morbid conditions

### Consider Alternative Diagnoses

- Bronchiolitis (especially under age 2)
- Pneumonia
- Foreign body
- Cardiac disease or congestive heart failure
- Congenital airway abnormalities
- Immune deficiency/mucociliary defect
- Cystic fibrosis

### ASTHMA:

- Episodic symptoms of airflow obstruction including wheezing, cough, or chest tightness.
- Airflow obstruction at least partially reversible.
- Exclusion of alternative diagnoses.

## EXCLUSION CRITERIA

- Age under 2 years
- Severe distress or requiring PICU Care
- Alternative diagnosis (see above)

## ASTHMA EXACERBATION CLASSIFICATION

### Mild Exacerbation

- Patient is alert and oriented, speaks in sentences, no accessory muscle use, may have slight expiratory wheeze, and is tachypneic.
- Peak flow > 80% of predicted or personal best (*see background information for age norms*)
- O2 sat > 95%
- Pediatric asthma score (PAS) <4

### Moderate Exacerbation

- Patient is agitated, not playful, and speaks in phrases. Patient is using accessory muscles, may have loud wheezing, and is tachypneic.
- Peak flow 50 – 80 % of predicted or personal best (*see background information for age norms*)
- O2 sat 91 – 95 %
- Pediatric asthma score (PAS) 5-11

### Severe Exacerbation

- Patient is breathless at rest, speaks in words. Patient is using accessory muscles, has suprasternal retractions, may have loud wheezing (throughout inhalation and exhalation), and is tachypneic.
- Peak flow < 50 % of predicted or personal best. However, a peak flow is not always appropriate to determine severity.
- O2 sat < 91%
- Pediatric asthma score (PAS) > 11

## ADMISSION CRITERIA

### Admit to pediatric unit:

1. Hypoxemia - O2 sat < 91% while breathing room air
2. Dehydration or difficulty feeding
3. Moderate to severe respiratory distress
4. Patient will require short acting beta agonist more often than every 4 hours
5. Concerning social situation or limited follow-up

### Admit to PICU:

1. PCO2 > 50mmHg (*NOTE: routine ABG is not recommended if not in severe distress*)
2. PCO2 > 40mmHg with moderate to severe respiratory distress
3. Severe respiratory distress with no clinical improvement with therapy
4. O2sat < 93% on > 40% FiO2
5. Patient requires continuous albuterol for greater than 60 minutes

## INPATIENT MANAGEMENT SUMMARY (see also order set for details)

1. Asthma education
2. Asthma management plan given at discharge
3. Oral corticosteroids (2 mg/kg/day) for 3-5 day duration. *(Note: if dexamethasone is used, two daily doses can be considered for non-severe exacerbations with clinical improvement and good follow up.)*
4. Beta agonists spaced every 2-4 hours to control distress and wheezing (if patient consistently requires beta agonists more often than every 2 hours consider PICU admission)
5. Initiation of maintenance inhaled corticosteroids prior to discharge, especially for patients with signs of persistent asthma
6. Patient may be monitored for response to therapy using Pediatric Asthma Scores (PAS) (see attached scoring system)
7. Consider using peak flow meter for monitoring of patients age 6 years and older
8. Routine CXR, peripheral IV, and laboratory work are not indicated for asthma exacerbations that respond appropriately to therapy
9. For patients with normal oxygen saturations after initial management, continuous oximetry monitoring is not recommended as part of routine care.

## DISCHARGE CRITERIA

1. Begin discharge planning on admission
2. Maintaining sustained O2 sat >90% on room air
3. Improved work of breathing
4. Patient does not require short acting beta agonist more often than every 4 hours
5. Asthma discharge checklist teaching complete and Asthma management plan given and understood
6. Patient started on inhaled corticosteroid if patient has persistent asthma
7. Influenza vaccine given (exceptions: patient already received annual vaccine or severe anaphylaxis to eggs. If severe anaphylaxis history, refer to allergist). Influenza vaccine season is August to April.
8. Oral feedings at a level sufficient to prevent dehydration
9. Home resources and family support are adequate to use any necessary home therapy
10. Home health care and medical supply agencies have been notified and arrangements for visits finalized
11. Review the potential harm of passive smoke inhalation for all families and offer smoking cessation support. The Massachusetts Smokers Helpline (1-800-QUIT-NOW, 1-800-784-8669) offers free individual phone support. Other resources are also available at [www.makesmokinghistory.org](http://www.makesmokinghistory.org).
12. Primary care provider has been notified of discharge decision and follow-up appointments have been scheduled

**PEDIATRIC ASTHMA  
INITIAL CLINICAL  
EVALUATION (age  
over 2 years)**

- ON ARRIVAL IF:**
- Pediatric asthma score > 12
  - PAS > 7 with ED equivalent therapy at home
  - History of intubation/respiratory failure
  - AND poor initial response to treatment

**Albuterol 2.5 mg q 20min x 3 (May use continuous 7.5 mg treatment over one hour)**

**Ipratropium 0.5 mg x 3 (May use Duoneb x 3)**

**Corticosteroid\* 2 mg/kg up to 60 mg PO or IV**

**CONSIDER  
IMMEDIATE PICU  
ADMISSION**

**PEDIATRIC ASTHMA  
SCORE (PAS) < 4  
(GOOD RESPONSE)**

**PEDIATRIC ASTHMA SCORE (PAS)  
> 4 (SOME IMPROVEMENT OR NO  
RESPONSE)**

- CONSIDER WHILE AWAITING  
PICU ADMISSION OR  
TRANSFER:**
- Continuous albuterol
  - Magnesium sulfate
  - Terbutaline
  - Aminophylline
  - Heliox for hypoxia
  - BiPAP
  - Intubation (reserve for impending respiratory failure due to risk of mortality)

Observe 45 to 60 min

Albuterol 2.5 mg x 1

Reassess

Reassess after 10 min

PAS < 4

PAS > 4

PAS < 4  
Mild or no  
distress

PAS 5-11  
Mild to moderate  
distress, stable

PAS > 11  
Severe distress  
or unstable

**DISCHARGE  
HOME  
Follow Up in  
24 hours**

Observe 45 to 60 min and Reassess

PAS < 4

Albuterol 5mg neb  
Q 2 hours  
**ADMIT TO  
PEDIATRIC  
INPATIENT  
UNIT**

**ADMIT  
TO  
PICU**

\* Corticosteroid dosing. Prednisone/prednisolone/methylprednisolone = 2 mg/kg up to 60 mg PO or IV/IM. Dexamethasone = 0.6 mg/kg up to 16 mg PO or IV/IM.

## BACKGROUND INFORMATION

### PEDIATRIC ASTHMA SCORE (PAS):

PAS	0-4	5-7	8-11	12-15
<b>Asthma Severity</b>	Normal	Mild	Moderate	Severe
<b>Scoring Factors</b>	0	1	2	3
<b>Respiratory Rate</b>				
2-3 Years	18-26	27-34	35-39	≥40
4-5 Years	16-24	25-30	31-35	≥36
6-12 Years	14-20	21-26	27-30	≥31
> 12 Years	12-18	19-23	24-27	≥28
<b>Oxygen Saturation (Take patient off O2 for reassessment for &lt; 5min)</b>	> 98% on RA	95-97% on RA	90-94% on RA	< 90% on room air or on any oxygen
<b>Auscultation</b>	Normal breath sounds with good aeration throughout	End expiratory wheezes only	Expiratory wheezing	Inspiratory and Expiratory wheezing to diminished breath sounds
<b>Retractions</b>	None	Intercostal	Intercostal and Substernal	Intercostal, Substernal and supraclavicular
<b>Dyspnea</b>	Speaks in complete sentences (> 2y.o)	Speaks in short sentences, coos and babbles	Speaks in partial sentences, short cry	Speaks in single words. Short phrases/ grunting

Usage of the PAS on all assessments provides consistency of language and severity of the child's respiratory status. Record the PAS on the flow sheet and use the score in all communications

### PREDICTED AVERAGE PEAK EXPIRATORY FLOW RATES FOR NORMAL CHILDREN

Height (in & cm)	PEFR (L/min)	Height (in & cm)	PEFR (L/min)
43	109	147	56
44	112	160	57
45	114	173	58
46	117	187	59
47	119	200	60
48	122	214	61
49	124	227	62
50	127	240	63
51	130	254	64
52	132	267	65
53	135	280	66
54	137	293	67
55	140	307	

PEFR, peak expiratory flow rate.

Data from Voter KZ. *Pediatr Rev* 1996;17(2):53-63.

## REFERENCES:

- 1) Guidelines for the Diagnosis and Management of Asthma - Summary Report 2007; National Heart Lung and Blood Institute
- 2) Behrman: Nelson Textbook of Pediatrics
- 3) Voter KZ. Pediatric Review 1996;17(2):53–63.
- 4) Asthma update: epidemiology and pathophysiology. Guill MF - *Pediatr Rev* - 01-SEP-2004; 25(9): 299-305
- 5) Two Days of Dexamethasone Versus 5 Days of Prednisone in the Treatment of Acute Asthma: A Randomized Controlled Trial. *Annals of Emergency Medicine*. Volume 58, Issue 2 , Pages 200-204, August 2011

*Practice guidelines do not necessarily apply to every patient. A provider's clinical judgment is essential. As always, clinicians are urged to document management strategies.*

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