Respiratory Care	**Written by:** Respiratory Leaders	**Page:** 1 of 7
Approved: June 2011	**Origin:** October 2010	**Title:** Asthma Assessment-treatment Guidelines

Purpose: To provide asthma patients with appropriate, timely and effective care based on assessment by respiratory care practitioners using standard assessment and treatment guidelines.

Overview:

A patient who meets the Asthma Guidelines may have an initial respiratory treatment started based on the guidelines prior to assessment by a physician/LIP. In addition, a chart review and physical assessment will be completed and a treatment plan developed based on these findings.

Ongoing assessments will be conducted and changes in the patient's status will be promptly communicated to the physician/LIP. Any adjustments to the treatment plan require a physician/LIP order.

Patients age ≥ 2 years that meet the Acute Asthma Guidelines will be classified as Mild, Moderate or Severe/Critical per NHLBI standards.

Admission/Treatment Criteria: Patients < 2 years of age must meet **one** of the following:

- Previous diagnosis of asthma or reactive airway disease, or history of wheeze
- First time wheeze and one of the following: food allergy, allergic rhinitis, eczema, or parent with asthma

Exclusion Criteria: Patients with any of the following should not be assessed nor treated by these guidelines:

- BPD with oxygen requirement or diuretic therapy
- Complex congenital heart disease
- Tracheostomy
- Complicated pneumonia (empyema or necrotic pneumonia)
- Cystic fibrosis
- Chronic lung disease/interstitial
- Bronchiolitis
- Intubated
- Heliox Therapy
- Bipap Therapy

Assessment: The following Pediatric Asthma Score (PAS) performed before and after each treatment; includes SpO_2. The floor therapist will write the score on the whiteboard in the patient's room.

Advancement: Two scheduled treatments will be given in the current PAS class prior to advancement along the PAS pathway.

Pediatric Asthma Score (PAS)

Exam Component	1	2	3
Respiratory Rate 1-4 years 4-6 years 6-12 years >12 years	 ≤ 34 ≤ 30 ≤ 26 ≤ 23	 35-39 31-35 27-30 24-27	 ≥ 40 ≥ 36 ≥ 31 ≥ 28
SpO_2 Requirement	> 95 % on room air	90-95 % on room air	< 90 % on room air **or** requiring oxygen
Retractions	None or intercostal	Intercostal and substernal	Intercostal, substernal, and supraclavicular
Work of Breathing (Count to 10)	Speaks in sentences, coos and babbles	Speaks in partial sentences, short cry	Speaks in single words/short phrases, grunting
Auscultation	Normal breath sounds to end-expiratory wheezes only	Expiratory wheezing	Inspiratory and expiratory wheezing to diminished breath sounds
Total PAS	Mild = 5-7	Moderate = 8-11	Severe/Critical ≥ 12

Severity: Total PAS score determines the severity and the guidelines for treatment and frequency. The patient severity determined during the pre-assessment offers guidance for pathway movement. The post-assessment score should be documented, but the treatment and frequency should not change based on post-assessment.

Inpatient Treatment Only

Mild	Moderate	Severe/Critical
Score 5-7 Q6h Frequency	**Score 8-11** Q4h Frequency	**Score 12-15** Q2h Frequency
Medication	**Medication**	
MDI □ < 20 kg 2 puffs □ > 20 kg 4 puffs **Nebulized** (Unable to tolerate MDI or MD preference) □ < 20 kg Albuterol 2.5 mg □ ≥ 20 kg Albuterol 5 mg	**MDI** □ < 20 kg 4 puffs □ 20-30 kg 6 puffs □ > 30 kg 8 puffs **Nebulized** □ < 20 kg Albuterol 2.5 mg □ ≥ 20 kg Albuterol 5 mg	**MDI** □ < 20 kg 6 puffs □ 20 – 30 kg 8 puffs □ > 30 kg 10 puffs **Nebulized** □ < 20 kg Albuterol 2.5 mg □ ≥ 20 kg Albuterol 5 mg **Floor intensification-** 5 mg Albuterol + 0.5 mg Ipratropium Q30" x 2

Emergency Department Treatment Only Mild	Moderate	Severe/Critical
Albuterol □ ≤ 20 kg 6 puffs MDI (space/mask) □ > 20 kg 12 puffs Nebulization □ ≤ 20 kg 2.5 mg / 3 mL Albuterol □ > 20 kg 5 mg / 6 mL	Albuterol □ ≤ 20 kg 6 puffs MDI (space/mask) □ > 20 kg 12 puffs Nebulization □ ≤ 20 kg 2.5 mg / 3 mL Albuterol □ > 20 kg 5 mg / 6 mL	Albuterol Nebulization (Intensification) □≤ 20 kg 7.5 mg / 9 mL □ > 20 kg 15 mg / 18mL
No atrovent indicated	Atrovent Nebulization □ 0.5 mg / 2.5 mL	Atrovent Nebulization □ 0.5 mg/2.5 mL

Emergency Department only: If patient is appropriate for floor admission, the inpatient medication guidelines will be followed until patient is transferred. Ancillary treatments for severe/critical patients are per ED Protocol.

PICU and IMCU: If the patient requires continuous therapy outside of the floor intensification therapy, then the patient will be admitted to the PICU or IMCU for continuous albuterol therapy and close observation and monitoring.

PICU/IMCU Pediatric Asthma Score (PAS)

Exam Component	1	2	3
Respiratory Rate 1-4 years 4-6 years 6-12 years >12 years	 ≤ 34 ≤ 30 ≤ 26 ≤ 23	 35-39 31-35 27-30 24-27	 ≥ 40 ≥ 36 ≥ 31 ≥ 28
SpO_2 Requirement	> 95 %	90-95 %	< 90 %
Retractions	None or intercostal	Intercostal and substernal	Intercostal, substernal, and supraclavicular
Work of Breathing (Count to 10)	Speaks in sentences, coos and babbles	Speaks in partial sentences, short cry	Speaks in single words/short phrases, grunting
Auscultation	Normal breath sounds to end-expiratory wheezes only	Expiratory wheezing	Inspiratory and expiratory wheezing to diminished breath sounds
Total PAS	Mild = 5-7	Moderate = 8-11	Severe/Critical ≥ 12

PICU/IMCU Process:

A respiratory therapist will provide a "trending PAS score" for assessments while patient is receiving continuous treatments and document every 2 hours.

Atrovent 0.5mg will be administered every 6 hour or Q20min treatments times 3 (if the patient has not received it over the past 24 hours).

Changes within the pathway can be made at Q2 intervals. Advancement can be only be made to the next level (no skipping levels without a treatment in current score level).

Patient should remain on continuous aerosol treatment (dosage **can** be weaned) until IV terbutaline is discontinued.

Institute peak flow measurement, along with assessment, once continuous therapy discontinued for children over the age of 5.

Guideline Patient **< 20 kg**:

Begin continuous albuterol treatment at 15mg/hr maximum dose or less per physician order for score <12..
Duration = 8hrs

Mix subsequent continuous solutions for a duration of 4hrs

Continue at 15mg/hr or at present strength of solution for assessment scores > 9

Begin and continue to wean albuterol by 5mg/hr for assessment scores ≤ 9

May begin Q2 aerosol at 2.5 mg or Q2 MDI = 6 puffs

Guideline patient **20-30 kg**:

Begin continuous albuterol treatment at 25mg/hr maximum dose or less per physician order for score <12.
Duration = 8 hrs

Mix subsequent continuous solutions for a duration of 4hrs

Continue at 25mg/hr or at present strength of solution for assessment scores > 9

Begin and continue to wean Albuterol by 5mg/hr for assessment scores ≤ 9.

May begin Q2 aerosol at 5 mg or Q2 MDI = 8 puffs

Guideline for patient **>30 kg**:

Begin continuous Albuterol treatment at 30mg/hr maximum dose or less per physician order for score <12.
Duration = 8 hrs

Mix subsequent continuous solutions for a duration of 4hrs

Begin and continue to wean Albuterol by 5mg/hr for assessment scores ≤ 9

Continue at 30mg/hr or present mg/hr delivery for assessment scores > 9

May begin Q2 aerosol at 5 mg or Q2 MDI = 10 puffs

PICU/IMCU Continuous Albuterol Dosage Table

0.5% ALBUTEROL = 5 MG/ML	1 HR 25mL TOTAL		2 HR 50mL TOTAL		4 HR 100mL TOTAL		8HR 200mL TOTAL	
	ALB	NS	ALB	NS	ALB	NS	ALB	NS
6 mL/hr = 30 mg/hr	6mL	19mL	12 mL	38 mL	24 mL	76 mL	48 mL	152 mL
5 mL/hr = 25 mg/hr	5 mL	20 mL	10 mL	40 mL	20 mL	80 mL	40 mL	160 mL
4mL/hr = 20 mg/hr	4 mL	21 mL	8 mL	42 mL	16 mL	84 mL	32 mL	168 mL
3 mL/hr = 15mg/hr	3 mL	22 mL	6 mL	44 mL	12 mL	88 mL	24 mL	176 mL
2 mL/hr = 10 mg/hr	2 mL	23 mL	4 mL	46 mL	8 mL	92 mL	16 mL	184 mL

Inhaled bronchodilators: MDI with valved holding chamber (VHC) is the preferred method of administration, however, nebulized doses are available if patient unable to tolerate MDI or physician preferred.

Asthma Education: Education should begin upon admission and occur during each therapy session, focusing on the individual topics identified during the learning assessment. Each patient should have an **Asthma Home Plan of Care** completed prior to discharge.

Recommended discharge criteria:
- PAS ≤ 7
- $SpO_2 \geq 92\%$ on room air
- Minimal or no wheezing
- Completion of asthma education
- Completion of **Asthma Home Plan of Care**

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Emergency Department Medical Director: **Barry Gilmore, MD. / Date**

Pediatric Intensive Care Unit Representative: **Federico Nievas, MD. / Date**

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