Pediatric Asthma Management Guideline

This guideline is applicable to the following sites:
SH GR Hospitals

Applicability Limited to: **Helen Devos Children's Hospital**

Reference #: 14587

Version #: 1

Effective Date: 06/17/2015

Functional Area: Clinical Operations, Respiratory

Department Area: Respiratory

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1. Purpose

Provide management guidelines for patients with primary diagnosis of asthma, utilizing assessment and monitoring to maximize the value of therapy.

2. Responsibilities

Physicians, Advanced Practice Providers (APP), Resident Physicians, Registered Nurses (RN), Licensed Respiratory Therapists (LRT)

3. Inclusion Criteria

3.1. All patients with a primary diagnosis of asthma, 2 years of age or older treated at Helen Devos Children's Hospital.

4. Exclusion Criteria

4.1. Patients less than 2 years of age
4.2. Patients admitted for an acute illness other than asthma
  4.2.1. Patients with primary diagnosis of bronchiolitis, pneumonia, or croup
4.3. Patients with Chronic Conditions in addition to asthma
  4.3.1. Primary Lung Diseases (Cystic Fibrosis, restrictive lung disease, lung transplant)
  4.3.2. Chronic Lung Disease (bronchopulmonary dysplasia)
  4.3.3. Congenital and/or Acquired Heart Disease
  4.3.4. Airway Issues (tracheostomy dependent, tracheomalacia)
  4.3.5. Medically Complex Children (multiple, severe issues)
  4.3.6. Immunocompromised (chemotherapy, sickle cell, primary immunodeficiency disorders)
4.4. Patients who require Critical Care Interventions

5. Assessment

5.1. Patients meeting the inclusion criteria will be assessed using the Asthma Score (AS) to determine severity of symptoms. (Scoring Grid Appendix A)
5.2. Asthma score will determine treatment plan and orders placed
5.3. Supplemental oxygen should be administered to keep saturation greater than or equal to 90%

5.4. **Continuous therapy monitoring requirements**
   5.4.1. **Patients in ED phases require continuous pulse oximetry during continuous therapy and for one hour post**
   5.4.2. **Patients in admission phases require a cardiac monitor during continuous therapy and for one hour post**

5.5. Pre and Post Peak Expiratory Flow Rates (PEFR) should be measured on all asthmatic patients greater than 5 years of age to help determine effectiveness of therapy.
   5.5.1. Frequency of Peak Flow:
      5.5.1.1. As tolerated during emergency visit or exacerbation
      5.5.1.2. At minimum, once every 12 hour shift during admission
   5.5.2. 10% plus improvement from pre to post treatment indicates positive response to therapy
   5.5.3. Predicted and/or Personal best PEFR should be determined and documented in patient medical record.
   5.5.4. Patients' inability to perform an adequate PEFR due to severity of symptoms or physical limitations should be recorded in the medical record.

NOTE: Albuterol doses of 8 puffs and 5mg can be interchanged. The route of delivery is determined on a case by case basis considering patient presentation, ability, tolerance, and home therapy. MDI therapy is preferred for admitted patients with adequate technique. All MDI medications will be delivered with a spacer; a spacer mask can be utilized in conjunction if patient unable to maintain an adequate seal with a mouthpiece. Nebulizers should be given via mouthpiece. Masks will be used if the patient unable to maintain an adequate seal with a mouthpiece. All Continuous treatments will be delivered via mask.

6. **Emergency Department Management** Plan of care is determined and modified based on the Asthma Score (Flow Chart Appendix B) see Pediatric ED Asthma Powerplan.

6.1. **Phase 1A** Initial Assessment
   6.1.1. **Asthma Score 0 to 5**
      6.1.1.1. Administer Albuterol 8 puffs via MDI or 5mg nebulization
      6.1.1.2. Administer Dexamethasone 0.6mg/kg once (16mg max)
   6.1.2. **Asthma Score 6-12**
      6.1.2.1. Administer Albuterol 15mg with Ipratropium Bromide1mg via continuous nebulization over one hour

6.2. **Phase 1B** Asthma Score transitioned:
   6.2.1. **Asthma Score 0 to 4**
      6.2.1.1. Discharge
      6.2.1.2. If initial score was greater than 5 observe for one hour prior to discharge
   6.2.2. **Asthma Score 5 to 8**
      6.2.2.1. Administer Albuterol 8 puffs via MDI or 5mg via nebulizer
   6.2.3. **Asthma Score 9 to12**
      6.2.3.1. Administer Albuterol 15mg via continuous nebulization over one hour
         6.2.3.1.1. Add Ipratropium Bromide1mg if not already given
      6.2.3.2. 6 years or greater, consider Magnesium Sulfate 50mg/kg IV once (max 2 grams)
      6.2.3.3. Asthma Score 9 or 10 **Admit to Phase II** while continuing ED care
      6.2.3.4. Asthma Score 11 to 12 **Admit to PCCU** while continuing ED care
   6.2.4. **PCCU admission criteria regardless of Asthma Score: Drowsiness, Confusion, Silent Chest exam, PEFR less than 25% predicted**

6.3. **Phase 1C** Phase progression
6.3.1. **Asthma Score 0 to 4**
6.3.1.1. If previous score was greater than 5 observe for one hour prior to discharge
6.3.1.2. Discharge
6.3.2. **Asthma Score 5 to 8**
6.3.2.1. **Admit to Phase III** while continuing ED care
6.3.2.2. Administer Albuterol 8 puffs via MDI or 5mg via nebulizer
6.3.3. **Asthma Score 9-12**
6.3.3.1. Administer Albuterol 15mg via continuous nebulization over one hour
6.3.3.1.1. Add Ipratropium Bromide1mg if not already given
6.3.3.2. Asthma Score 9 or 10 **Admit to Phase II** while continuing ED care
6.3.3.3. Asthma Score 11 to 12 **Admit to PCCU** while continuing ED care
6.3.4. **PCCU admission criteria regardless of Asthma Score: Drowsiness, Confusion, Silent Chest exam, PEFR less than 25% predicted**
6.4. **Emergency Department Discharge:**
6.4.1. **Prescribe additional dose of Dexamethasone 0.6 mg/kg (max 16mg) to be taken 24 hours post discharge**

7. Admission Frequency and Dosage: Plan of care is determined and therapy increased or decreased based on Asthma Score using scheduled frequency as outlined without the use of PRN therapy. (Scoring Grid Appendix A / Flow Chart Appendix C) see: Pediatric Inpatient Asthma Powerplan.

7.1. **Severe: Asthma Score greater than 10**
7.1.1. Administer Albuterol 15 mg continuous nebulization
7.1.2. For direct admissions add 1mg Ipratropium Bromide
7.1.3. PCCU transfer if the Asthma Score remains greater than10 after one hour of therapy.
7.1.4. **PCCU criteria regardless of Asthma Score: Drowsiness, Confusion, Silent Chest exam, PEFR less than 25% predicted**

7.2. **Moderate/Severe: Asthma Score of 9 to 10**
7.2.1. **Phase II:** Administer Albuterol 10 mg continuous nebulization
7.2.2. Provider (HDVCH Hospitalist or Senior Resident) must notify PCCU attending if Asthma Score remains 9 to 10 after 3 hours on continuous albuterol treatment.

7.3. **Moderate: Asthma score of 5 to 8**
7.3.1. **Phase III:** Administer Albuterol 5mg every two hours
7.3.2. Transition to Albuterol 8 puffs MDI every two hours for patients with adequate technique.

7.4. **Mild: Asthma score 0 to 4**
7.4.1. **Phase IV:** Administer Albuterol 8 puffs MDI or 5mg Neb every 4 hours
7.4.1.1. Advance to phase V if score remains less than 5 after one treatment
7.4.2. **Phase V:** Administer Albuterol 4 puffs MDI or 2.5mg every 4 hours
7.4.3. Maintain home therapy (if admitted for reasons other than exacerbation)
7.4.4. **Discharge** when Asthma score 0 to 4
7.4.4.1. May discharge after first treatment in phase V
7.4.4.2. Asthma Action Plan required at discharge for all admitted patients

8. RT to Notify Provider (HDVCH Hospitalist or Senior Resident) for

8.1. All phase transitions
8.2. Failure to advance from phase II after 3 hours on continuous Albuterol
8.3. Failure to progress after 12 hours in all other phases
8.4. Persistent oxygen requirement in phase IV.
8.5. PCCU criteria present
8.6. Physician orders written outside of Pediatric Asthma Management Guideline.
8.7. RT to Notify Pulmonary Rehab when patient at Phase IV

9. Provider (HDVCH Hospitalist or Senior Resident) to notify PCCU Intensivist for

9.1. Asthma Score greater than 10
9.2. Failure to advance from phase II after 3 hours on continuous Albuterol
9.3. PCCU criteria present

10. Documentation

10.1. Asthma Score
10.2. Medications administered
10.3. Response to therapy
10.4. PEFR (if applicable)
10.5. Asthma Action Plan
10.5.1. Medication sections must be completed by the provider
10.5.2. Pulmonary Rehab (PR) is responsible for educating the family
10.5.3. LRT to notify PR when patient at phase IV
10.5.4. RN reviews with family at time of discharge
10.5.5. Family must receive a copy of the document

11. Revisions

Spectrum Health reserves the right to alter, amend, modify or eliminate this protocol at any time without prior written notice and in compliance with *Administrative Policy: Policy and Procedure Structure, Standards and Management*.

12. References

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13. Protocol Development and Approval

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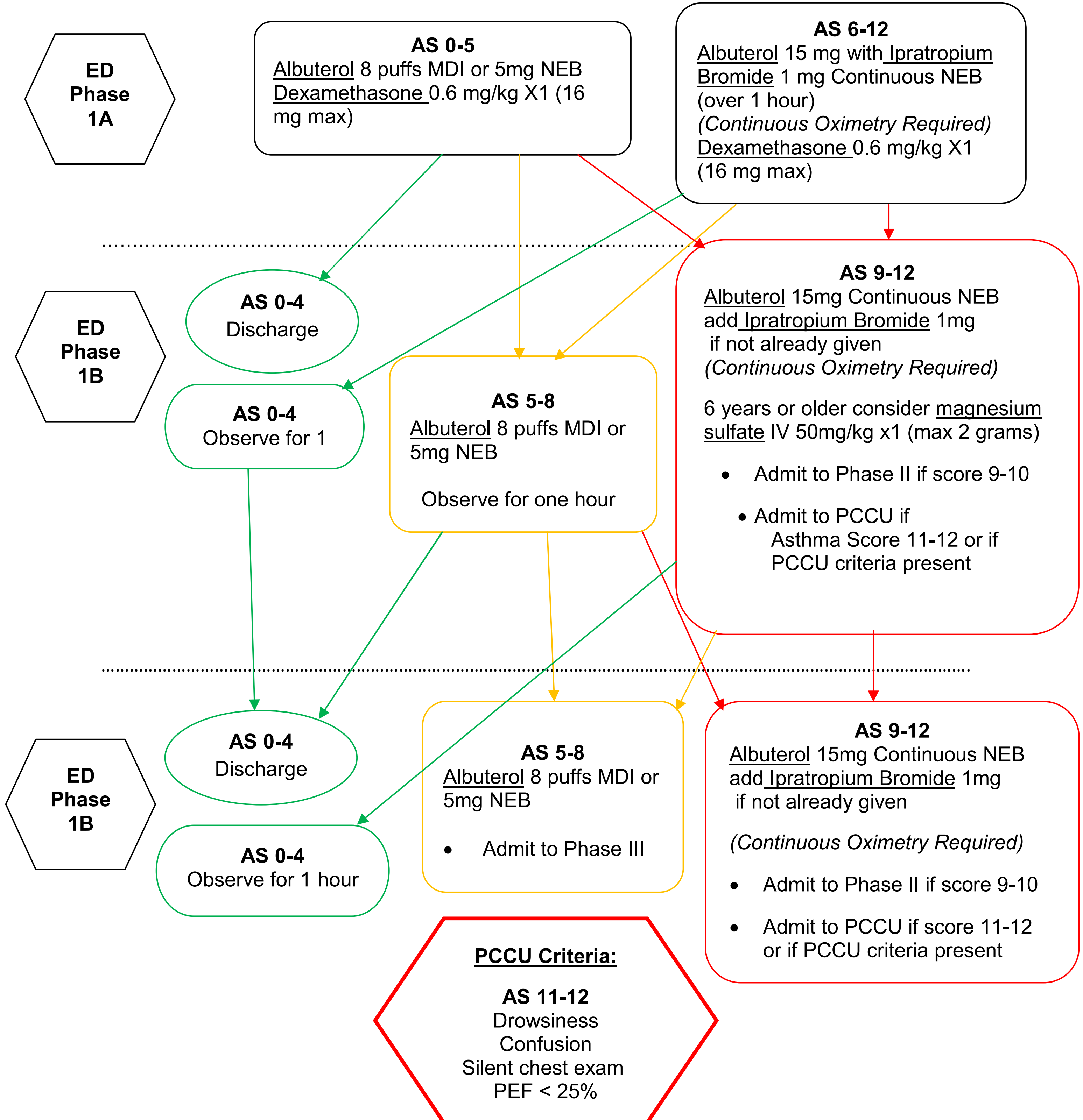
14. Keywords
Asthma, Score, Respiratory, Albuterol

Appendix A: Asthma Severity Score (2 and older)

Scoring	0	1	2	3
Respiratory Rate				
2-3 years	18-26	27-34	35-39	Greater than 39
4-5 years	16-24	25-30	31-35	Greater than 35
6-12 years	14-20	21-26	27-30	Greater than 30
Over 12 years	12-18	19-23	24-27	Greater than 27
Auscultation	Normal breath sounds with good aeration	End Expiratory wheezes only	Expiratory wheezes throughout	Inspiratory & Expiratory wheezes to diminished throughout
Retractions	None	Mild – Subcostal or Intercostal	Moderate – 2 of the following Subcostal Intercostal Substernal or Nasal flaring	Severe- 3 of the following Subcostal Intercostal Substernal or Nasal flaring or head bobbing
Dyspnea	Normal vocalization and activity	Decreased vocalization, agitated or coughing	Minimal vocalization, short cry, decreased activity	Unable to speak, grunting, confused or drowsy
Total Score	0-4 Mild	5-8 Moderate	9-10 Severe	>10 Status

Appendix B:



Appendix C:

Asthma Management Inpatient Phases

Supplemental Oxygen should be administered to keep O_2 saturation at or above 90%

DIRECT ADMISSIONS:
AS 10-12 Albuterol 15 mg with Ipratropium Bromide 1 mg Continuous NEB X1
Then follow phase progression

Phase II: AS 9-10
Albuterol 10mg Continuous NEB

(Cardiac Monitoring Required)

Asthma Score hourly

PCCU notification required after 3 hours

PCCU Criteria:
AS 11-12
Drowsiness
Confusion
Silent chest exam
PEF < 25%
May give one Albuterol 15mg NEB continuous on floor with *Cardiac Monitoring*

Notify Hospitalist Consider calling an AWARE

Inpatient Steroid Treatment
Transition to methylprednisolone or prednisolone (2mg/kg/day) q am for a total course of 5-10 days depending on severity exacerbation.

Phase III: AS 5-8
Albuterol 8 puffs MDI or 5mg NEB q 2 hours

Asthma score every 2 hours.

Peak Flow
Pre and post peak flow should be measured for children greater than 5 years of age

Phase IV: AS 0-4
Albuterol 8 puffs MDI or 5 mg NEB q 4 hours

Asthma score q 4 hours
Assure discharge teaching and plan in place

- Advance to Phase V after one treatment if score still below 5

Phase V: AS 0-4
Albuterol 4 puffs MDI or 2.5mg NEB q 4 hours

Asthma score q 4 hours

- May discharge after one treatment

Asthma Action Plan – Required for Inpatient Discharges

DR is responsible for filling in rescue and controller medications

RT to notify PR when patient at Phase IV.

PR is responsible for educating family on plan of care

RN reviews at time of discharge

Family must receive a copy of the document
Additional copies can be printed

Phase Progression/Regression
Plan of care is determined and therapy increased or decreased based on Asthma Score using scheduled frequency as outlined without the use of PRN therapy.

RT to notify DR for:
- All phase transitions
- Failure to advance in phase II after 3 hours continuous albuterol
- Failure to progress after 12 hours all other phases
- Persistent oxygen requirement in Phase IV
- PCCU criteria present

DR to notify PCCU for
- Asthma score over 10
- Failure to advance after 3 hours continuous albuterol
- PCCU criteria present

Appendix D: