



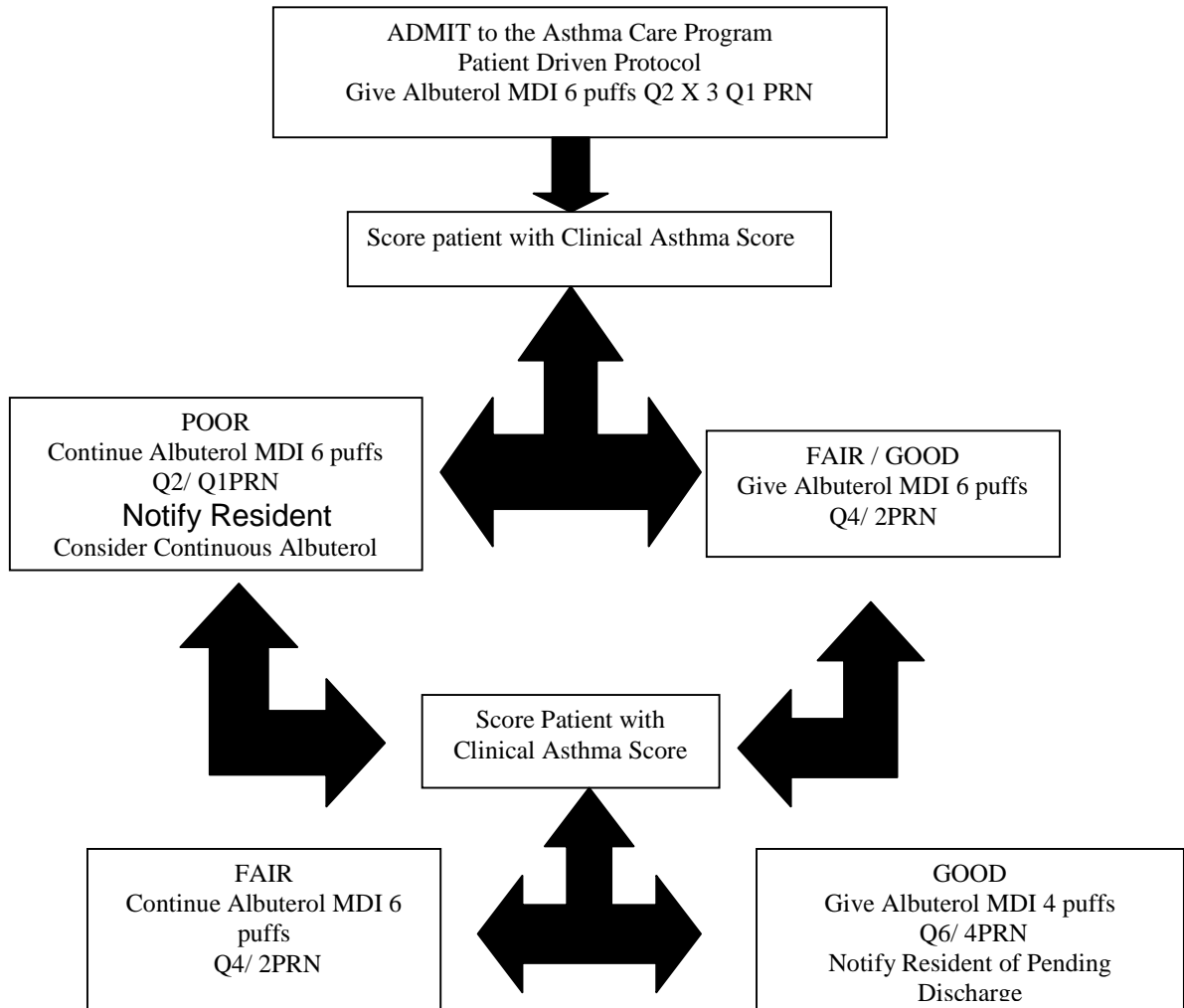
DAYTON CHILDREN'S HOSPITAL  
CLINICAL PRACTICE GUIDELINES

**DISCLAIMER:** This Clinical Practice Guideline (CPG) generally describes a recommended course of treatment for patients with the identified health needs. This CPG is not presented and should not be used as a substitute for the advice of a licensed independent practitioner, as individual patients may require different treatments from those specified, and guidelines cannot address the unique needs of each patient. Dayton Children's shall not be liable for direct, indirect, special, incidental or consequential damages related to the use of this CPG.



Asthma Care Program  
Patient Driven Protocol

Aerosol Therapy Quick Reference





**Asthma Care Program  
Patient Driven Protocol**

***Admission Process:***

This guideline is focused on the management of asthma inpatient settings, excluding the ICU patients. Once the ED physician determines that the patient needs to be admitted to the Asthma Care Program (ACP), the ARD will be called and orders for the Asthma Care Program will be entered into EPIC.

***Inclusion Criteria:***

- Patient > 12 months of age -Primary reason for admission will be Asthma/RAD.
- Reversible airway obstruction demonstrated after 1-3 beta-agonist aerosols OR has a prior diagnosis of asthma/ RAD.

***Exclusion Criteria:***

- Diagnosis of Bronchiolitis or has another cause of wheezing.
- First episode of acute wheezing and demonstrates no bronchodilator response after 1-3 beta –agonist aerosols.
- If patient is < 12 months and /or diagnosis is uncertain consider specialist referral).

***Upon arrival to the unit, the staff will assess and complete the following:***

***History:***

- Medications
- Allergies
- Recent or past steroid use
- PICU admissions
- Identification of primary care provider.

***Physical:***

- Height, weight (if not done in ED)
- Temperature
- Pulse
- Respiratory Rate
- Blood pressure
- Alertness.

***The patient will be assessed using the following criteria:***

- SpO<sub>2</sub>
- Use of accessory muscles
- Auscultation
- Peak flows on patients older than 5 years (if capable of performing maneuver)

These assessments are to determine a score using the asthma scoring system (refer to asthma scoring chart). The patient will be scored as GOOD, FAIR or POOR. This rating is determined by the patient meeting any one criteria of the most severe category. This assessment will be compared to later scores, indicating improvement or worsening of the patient's clinical condition and to determine frequency of treatment and when to notify the resident.

**Oxygen Therapy:** Oxygen will be administered via venti-mask or nasal cannula for SpO<sub>2</sub> less than 91%, or for patients with SpO<sub>2</sub> of 91% with significant work of breathing. Aim is to keep SpO<sub>2</sub> between 91-94% during acute exacerbation<sup>1</sup>.

If cannular oxygen is used and higher flows required, FiO<sub>2</sub> can be quantified with a venti-mask. If patient requires long term oxygen or if humidity deficit is suspected a cool aerosol with ½ normal saline will be set up.

*Please notify MD when oxygen is initiated, Wean oxygen per protocol.*

If a patient requires more than 40% oxygen per venti-mask, or nasal cannula equivalent, to raise SpO<sub>2</sub> to 94%, the RCP will notify the resident. Consider obtaining a CXR and ABG. The continued need for FiO<sub>2</sub> > 40% warrants consideration of transfer to the PICU.

**Laboratory Test:** Consider (if not done in ED):

- Blood gas for increase distress
- Theophylline level if patient on Theophylline at home
- CXR should be obtained if fever, asymmetric chest exam or first time wheezing episode to R/O other causes of wheezing.
- Patients that require Q1-Q2 albuterol for > 12hours should have serum K<sup>+</sup> tested as frequent Albuterol treatments can result in decreasing K<sup>+</sup> levels; patients on diuretics or with cardiac or renal disease are most at risk.

**Medications:**

**Steroid Therapy:** Intravenous steroids are no more effective than orally administered agents in the management of asthma. Intravenous steroids may be indicated if the patient is unable to tolerate oral medication due to nausea, vomiting, taste, or if absorption of oral agents is compromised by a co-existing condition.

- Dosing for IV steroids (Methylprednisolone) 1 mg/kg per dose q6 hr up to a maximum of 120-180 mg/day.
- Dosing for PO Steroid (Prednisolone or Prednisone) are acceptable options for completing a short course steroid "burst". Dose is 1-2 mg/kg/day, maximum 60

mg/day, for 3- 10 days. Dose tapering after completion of “burst” is generally not necessary to protect against asthma relapse. Dexamethasone is generally not appropriate due to its long ½ life and increased adrenal suppression compared to prednisone. When indicated, it should be given for 1-2 days.

*Note:* If the patient is on routine inhaled corticosteroid (ICS) for chronic asthma control, it is not necessary to stop their use during exacerbation. ICS can be initiated anytime regardless of oral dosing for exacerbation, especially since their onset of action is gradual. Also, starting ICS before discharge gives the patient and caregivers time to learn and demonstrate appropriate technique.

**Duoneb Aerosol Therapy:** NAEP guidelines suggest the use of an anticholinergic with a Beta-2 Agonist (Duoneb) for a severe asthma exacerbation. Therefore, it is the routine treatment in the ED. Patients who are directly admitted should be evaluated for the severity of their exacerbation to decide if they would benefit from Duoneb.

- Dosing for Duoneb aerosols: Routine treatment in the ED or for patients determined to have severe asthma upon direct admission will be given with Duoneb ( Albuterol: 2.5mg/ 0.5 cc + Ipratropium Bromide: 500 mcg). Discontinue Duoneb after 3 aerosol treatments and continue with Albuterol MDI's with VHC for additional treatments.
- With each Duoneb aerosol given attempt breathing exercises (diaphragmatic and pursed lip breathing) for improved control of dyspnea and improved aerosol deposition.

### **The Routine Inpatient Asthma Care Protocol:**

**Albuterol MDI treatment: Metered Dose Inhaler (MDI) + Valve Holding Chamber (VHC) is the default delivery route for patients hospitalized.**

*Note:* Unit Dose Albuterol 2.5mg/ 3 ml. via nebulization is reserved for patients that are unable to use MDI+ VHC or per attending physician discretion.

Begin Albuterol MDI with VHC at **6 puffs** Q2 hr x 3, Q1PRN. Administer each puff at one minute interval.

- If patient's first assessment meets any criteria in the POOR category, give Q1hr treatment with **6 puffs** of Albuterol MDI +VHC. Notify resident and document in the progress notes. If patient demonstrates no improvement or worsens, consider blood gas, continuous Albuterol aerosol and transfer to PICU.

After the 3 initial Q2 MDI treatments, assess patient and treat according to protocol.

- If asthma score is in the GOOD/ FAIR category, then wean to Albuterol MDI

with VHC using **6 puffs** Q4/Q2PRN. Administer each puff at 1 minute intervals

- If asthma score is in the POOR category, continue Albuterol MDI with VHC using **6 puffs** Q2/Q1 PRN. Notify resident and document in the progress notes.

After the first Q4 hour MDI treatment patient may be spaced to Q6/Q4PRN when Asthma score is in the GOOD category. Continue to utilize Albuterol MDI with VHC at **4 puffs**. Administer each puff at 1 minute interval.

Note: With each MDI/ VHC treatment the RCP will reinforce proper technique with the patient and family.

**Clinical assessment:** Respiratory distress and fatigue as well as objective measurement of airflow (PEFR) and oxygen saturation will be performed and documented pre and post each albuterol treatment. (Note: PEFR may not be obtainable due to patient's age, cooperation or effort.)

**Patient Education:** RCP's will clarify home management care plans and verify current home therapy. Asthma education and home care instruction will include all applicable topics:

- Asthma facts – signs, symptoms and triggers/avoidance
- Peak flow monitoring (indicated in patients with severe asthma)
- Patient specific medications: Beta-2, PO steroids, anti-inflammatory inhaled drugs (rescue vs. controller, dosage, frequency and mode of delivery).
- MDI and VHC instruction (Priming, technique, tracking and cleaning)
- Dry Powder Inhaler (Priming, technique, tracking , cleaning and storage)
- Aerosol compressor/nebulizer use if indicated in patients that are unable to use MDI+ VHC.
- Secondhand smoke (SHS) counseling
- Asthma Care Plan (reviewed for accuracy before giving it to the family)

**General Principles:**

- Every contact with the patient and family should be used to advance the family's knowledge of asthma management including supervised MDI/VHC usage.
- Financial constraints, which may interfere with access to prescriptions or DME, must be determined and solutions pursued.

**Patient Discharge:**

Discharge criteria:

- Asthma score is in the GOOD category for 4-6 hours post aerosol
- PEFR  $\geq$  70% of predicted or personal best (if obtainable)
- SpO2  $\geq$  91% on room air
- No accessory muscle use

- None or end expiratory wheezing per auscultation
- Able to tolerate PO fluids and medications
- Caregivers able to provide the appropriate level of care for the patient
- Follow-up physician identified.

RN will obtain all prescriptions necessary for home going supplies and medications. RN will also provide the patient with labeled inhaled controller medications dispensed during hospitalization. Staff will complete documentation on all asthma education and home care instruction. RCP and RN will facilitate medications and equipment procurement.

**Asthma Care Plan:** Every patient with a discharge diagnosis of asthma or RAD MUST be discharged with an AAP with the following accurately documented:

- Green Zone- Controller medication or if one was considered (dose, frequency, mode of delivery). Most patients will require chronic, daily-inhaled anti-inflammatory use for prevention of recurrence. The most common choices are inhaled corticosteroids and leukotriene modifiers.
- Yellow/Red Zones-Rescue medication (dose, frequency, mode of delivery)
- Triggers listed to indicate family is aware how to avoid
- Contact information (physician or practice name and phone #) to call when in distress and to make follow-up appointment
- Timeframe for follow-up

**Discharge requires:**

- Patient/family instructions and training completed with verbalizing and demonstrating appropriate asthma self-management.
- Necessary equipment arranged for home use
- Method for obtaining discharge medications established
- Asthma Action Plan completed and given to patient/caregivers

*Also required*, is the documentation in EPIC that the AAP was given to the family after instruction by the RCP or discharge RN, if RCP is not available.

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