Asthma Clinical Pathways: Emergency Department & Inpatient

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MAGNET RECOGNIZED AMERICAN NURSES CREDENTIALING CENTER

BEST CHILDREN'S HOSPITAL WOMEN'S CHOICE AWARD 2021

What is a Clinical Pathway?

An evidence-based guideline that decreases unnecessary variation and helps promote safe, effective, and consistent patient care.

Objectives of Pathway

- To standardize management of patients presenting with asthma exacerbation
- To ensure safe transfer of patients from the Emergency Department to Inpatient Unit
- To ensure all patients are discharged with a completed asthma home treatment plan
- To ensure that all eligible patients are started on a daily inhaled corticosteroid

Why is Pathway Necessary?

- In the US. asthma affects 7 million children under 18 years[1]
- In 2010, 58.3% of children with asthma had at least one asthma attack in the previous twelve months[2]
- Nearly 20% of children diagnosed with asthma went to an ED for care in 2009[3]
- Asthma is the third ranking cause of hospitalization for children and one of the leading causes of school absenteeism, approximately 12.8 million school days[4]
- Less than half of all children with asthma have an asthma action plan[1]
- Clinical pathways for asthma can decrease LOS, costs, and unnecessary antibiotic use without increasing rates of readmissions, leading to higher value care[5]

Modified Pulmonary Index Score[6]

- Drives both ED and Inpatient asthma management
- Validated score, including subjective and objective components
- Highly reproducible among different groups of healthcare professionals: physicians, nurses, and respiratory therapists
- MPIS positively correlates with ICU admission, days of continuous albuterol therapy, days of supplemental oxygen, and LOS, with MPIS ≥12 being more highly correlated with ICU admission

Modified Pulmonary Index Score[6]

O_2 Saturation (RA)		Accessory Muscle Use		I:E Ratio		Wheezing		Heart Rate			Respiratory Rate		
	Score		Score		Score		Score	<3 yr old	>3 yr old	Score	<6 yr old	>6 yr old	Score
>95%	**0**	None	**0**	2:1	**0**	None: Good aeration	**0**	<120	<100	**0**	<30	<20	**0**
93-95%	**1**	Mild	**1**	1:1	**1**	End expiratory	**1**	121-140	101-120	**1**	31-45	21-35	**1**
90-92%	**2**	Moderate	**2**	1:2	**2**	Insp/Exp: Good aeration	**2**	141-160	121-140	**2**	46-60	36-50	**2**
<90%	**3**	Severe	**3**	1:3	**3**	Insp/Exp: Decreased aeration	**3**	>160	>140	**3**	>60	>50	**3**

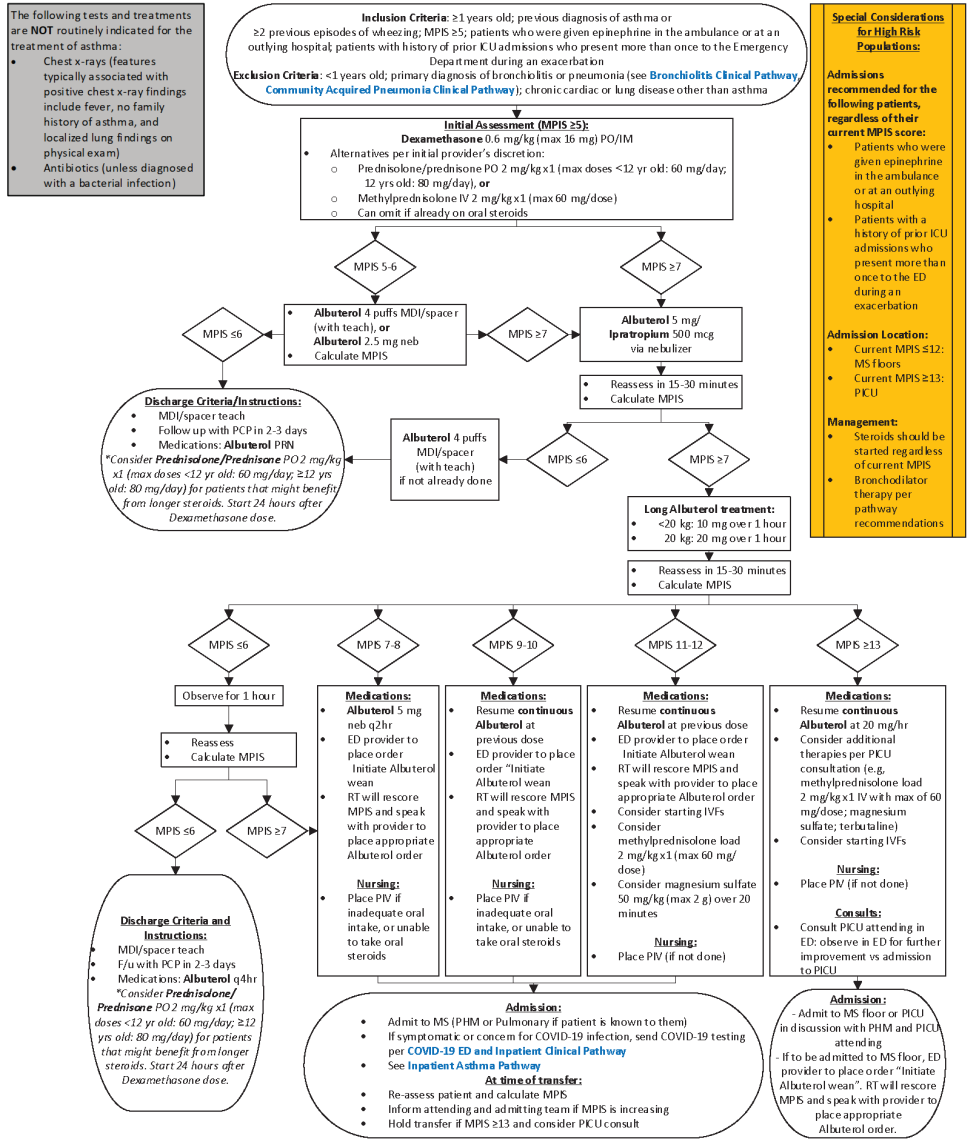
This is the Emergency Department Asthma Clinical Pathway.

We will be reviewing each component in the following slides.

CLINICAL PATHWAY:

Emergency Department Asthma

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.



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CLINICAL PATHWAY:

Emergency Department Asthma

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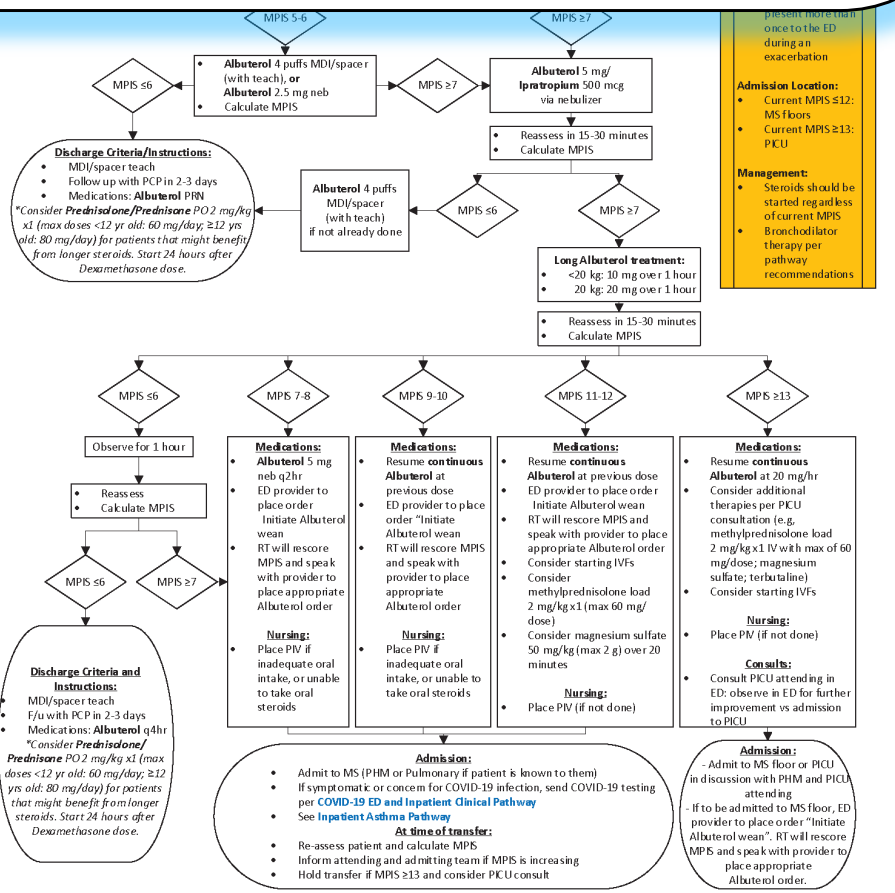
Inclusion Criteria: ≥1 years old; previous diagnosis of asthma or ≥2 previous episodes of wheezing; MPIS ≥5; patients who were given epinephrine in the ambulance or at an outlying hospital; patients with history of prior ICU admissions who present more than once to the Emergency Department during an exacerbation

Exclusion Criteria: <1 years old; primary diagnosis of bronchiolitis or pneumonia (see **Bronchiolitis Clinical Pathway**, **Community Acquired Pneumonia Clinical Pathway**); chronic cardiac or lung disease other than asthma

- Patients who have a primary diagnosis other than asthma (such as bronchiolitis) are excluded from this pathway

Patients with pneumonia may still be included if the pneumonia is triggering asthma symptoms



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The following tests and treatments are NOT routinely indicated for the treatment of asthma:

- Chest X-Rays[7]
- Antibiotics (unless diagnosed with a bacterial infection)[7,8,9]

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Emergency Department Asthma

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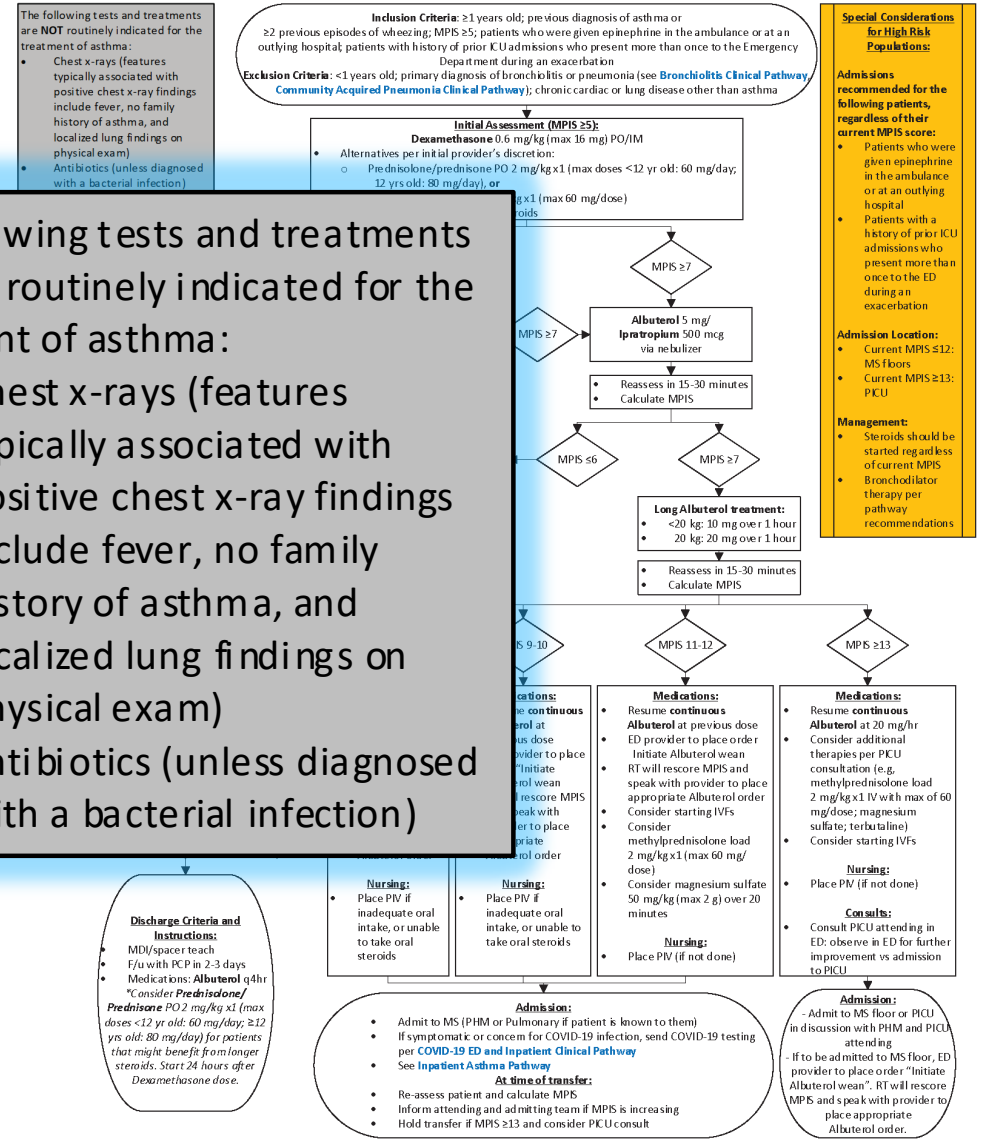

The following tests and treatments are **NOT** routinely indicated for the treatment of asthma:

- Chest x-rays (features typically associated with positive chest x-ray findings include fever, no family history of asthma, and localized lung findings on physical exam)
- Antibiotics (unless diagnosed with a bacterial infection)

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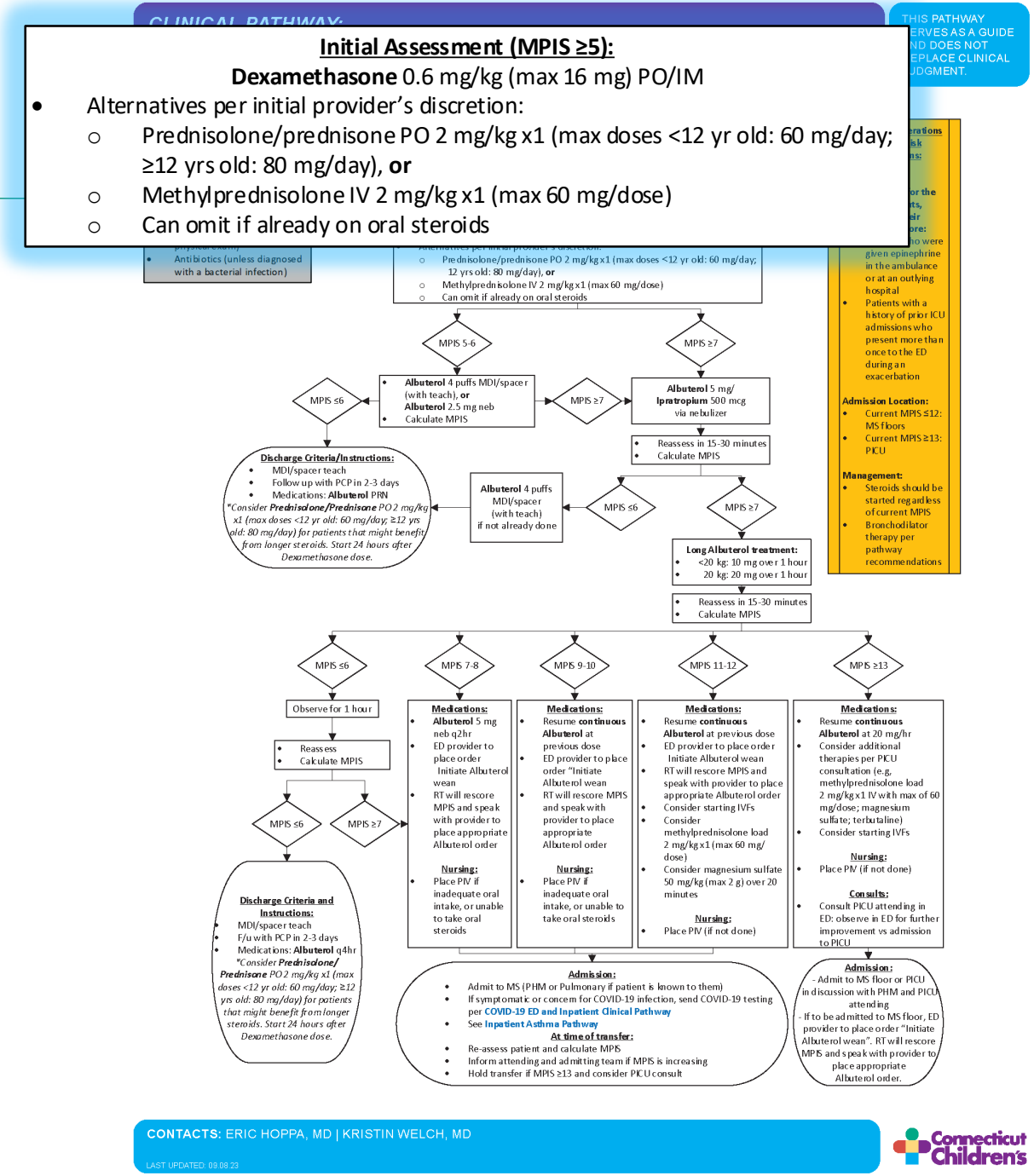
- **Every patient in the ED should receive systemic steroids**, either PO or IM (if not tolerating PO) within 1 hour of presentation
  - Dexamethasone may be preferable because it is a single dose that lasts 24 hours. This may be helpful for medication adherence and for patients who have difficulty taking PO meds
  - Alternatives are listed here, which include prednisolone/prednisone PO, or methylprednisolone IV.
  - Oral corticosteroids require at least 4 hours to show clinical improvement[7]
  - Administration can be held if the patient is already on oral steroids.
- **After steroid administration, the pathway divides based on MPIS score.**



CLINICAL PATHWAY:

Emergency Department Asthma

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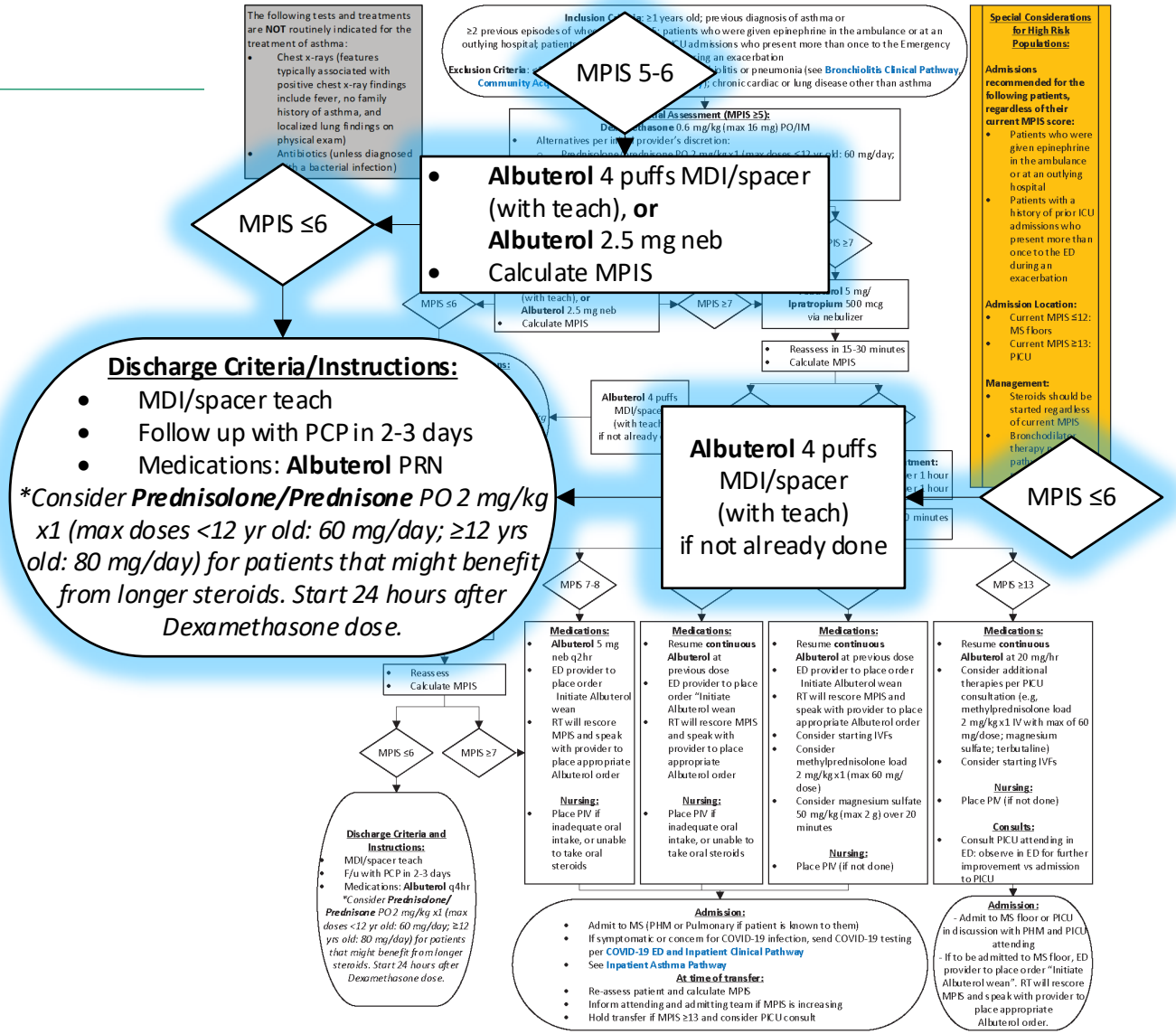
MPIS ≤6:

- For those with initial MPIS scores of 5-6, give albuterol (4 puffs or 2.5 mg neb)
- If MPIS continues to be ≤6 after administration of Albuterol, patients may be discharged from the ED with follow up arranged
- Dosing for prednisolone/prednisone PO has been provided for those patients who may benefit from longer steroids. This is to be started 24 hours after the dexamethasone dose is given.



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CLINICAL PATHWAY:

Emergency Department Asthma

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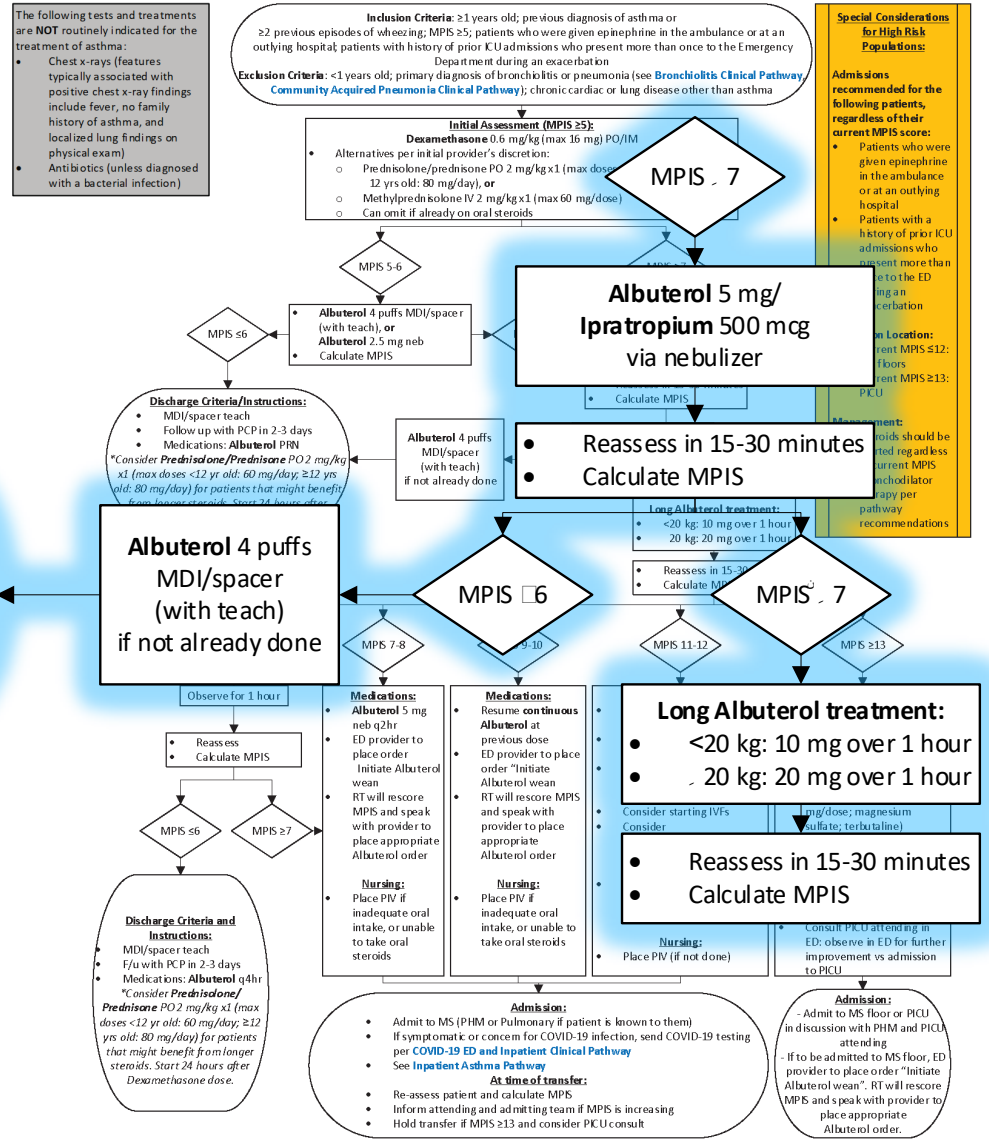
MPIS ≥7:

- If the initial MPIS score is ≥7, Albuterol/Ipratropium 500mcg should be administered
  - If MPIS continues to be ≥7 after the Albuterol/Ipratropium, the patient should get a long albuterol treatment (weight-based)
  - If MPIS improves to ≤6 after the Albuterol/Ipratropium, can get an albuterol MDI and be discharged home with follow up arranged

Discharge Criteria/Instructions:

- MDI/spacer teach
- Follow up with PCP in 2-3 days
- Medications: **Albuterol** PRN

Consider **Prednisolone/Prednisone PO 2 mg/kg x1 (max doses <12 yr old: 60 mg/day;↑ 12 yrs old: 80 mg/day) for patients that might benefit from longer steroids. Start 24 hours after Dexamethasone dose.*



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After receiving Albuterol/Ipratropium and an hour-long Albuterol treatment, disposition is stratified by MPIS .

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Emergency Department Asthma

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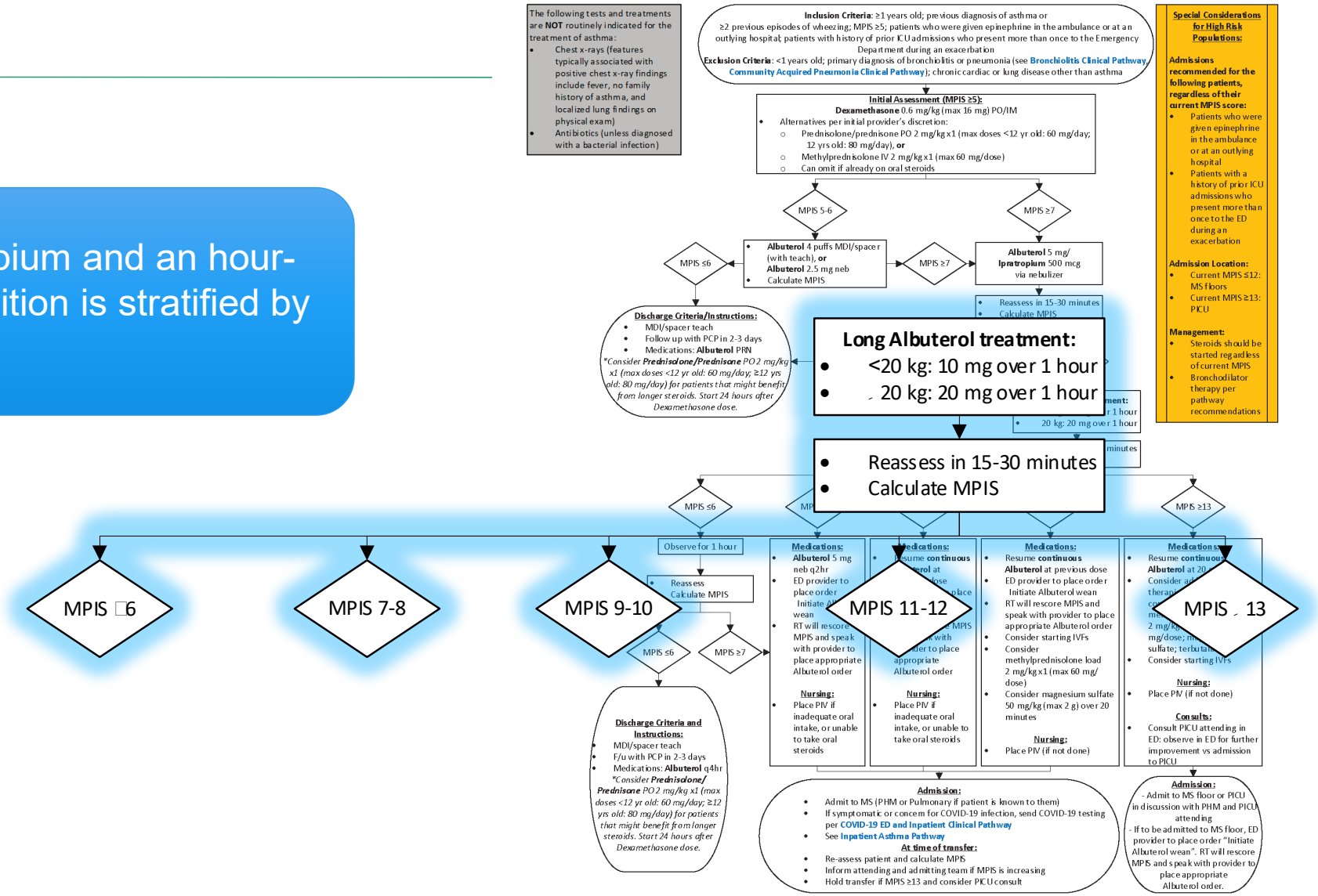

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Emergency Department Asthma

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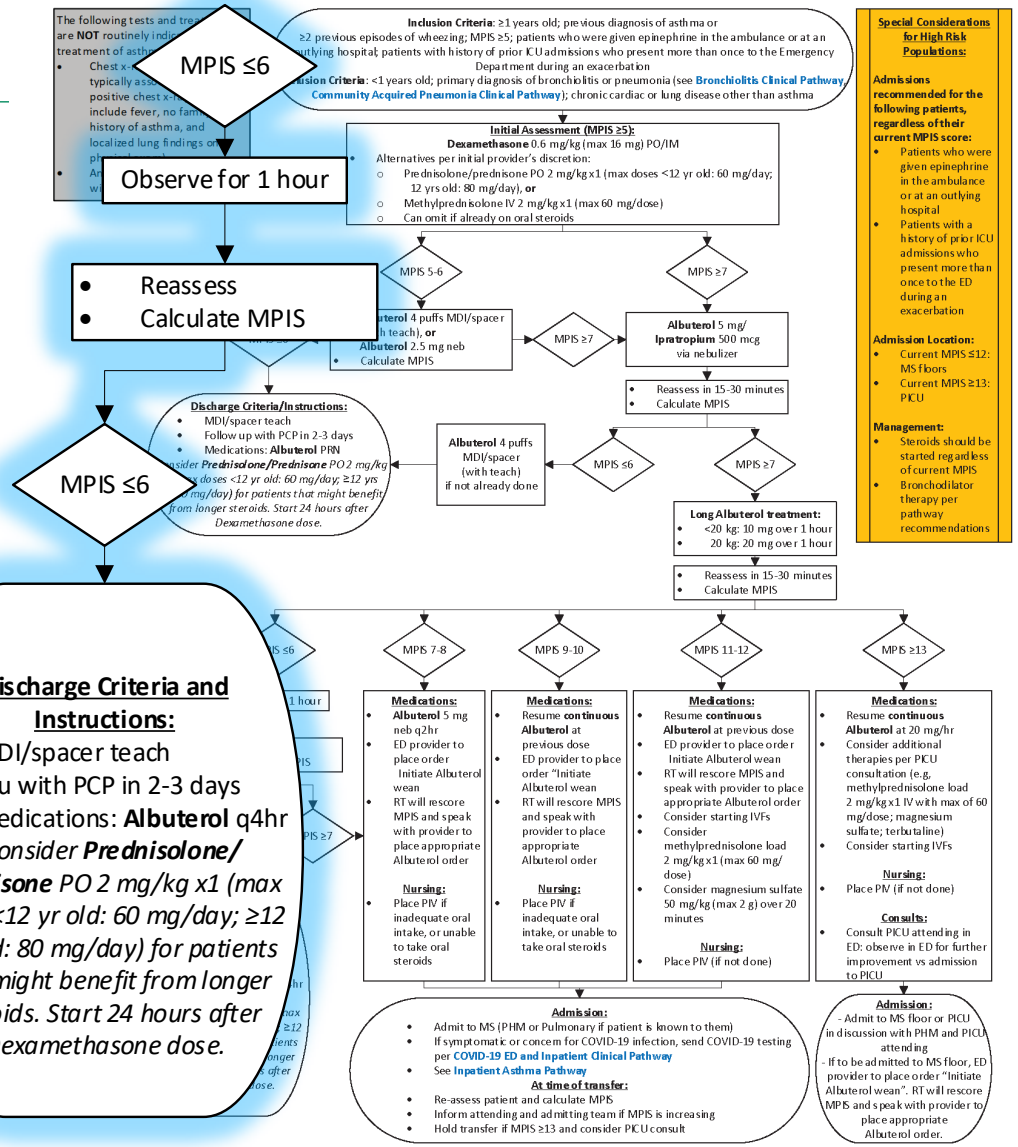
MPIS ≤6:

- Patient should be observed for 1 hour and then reassessed with a new MPIS.
- If their MPIS remains ≤6, they may be discharged from the ED.



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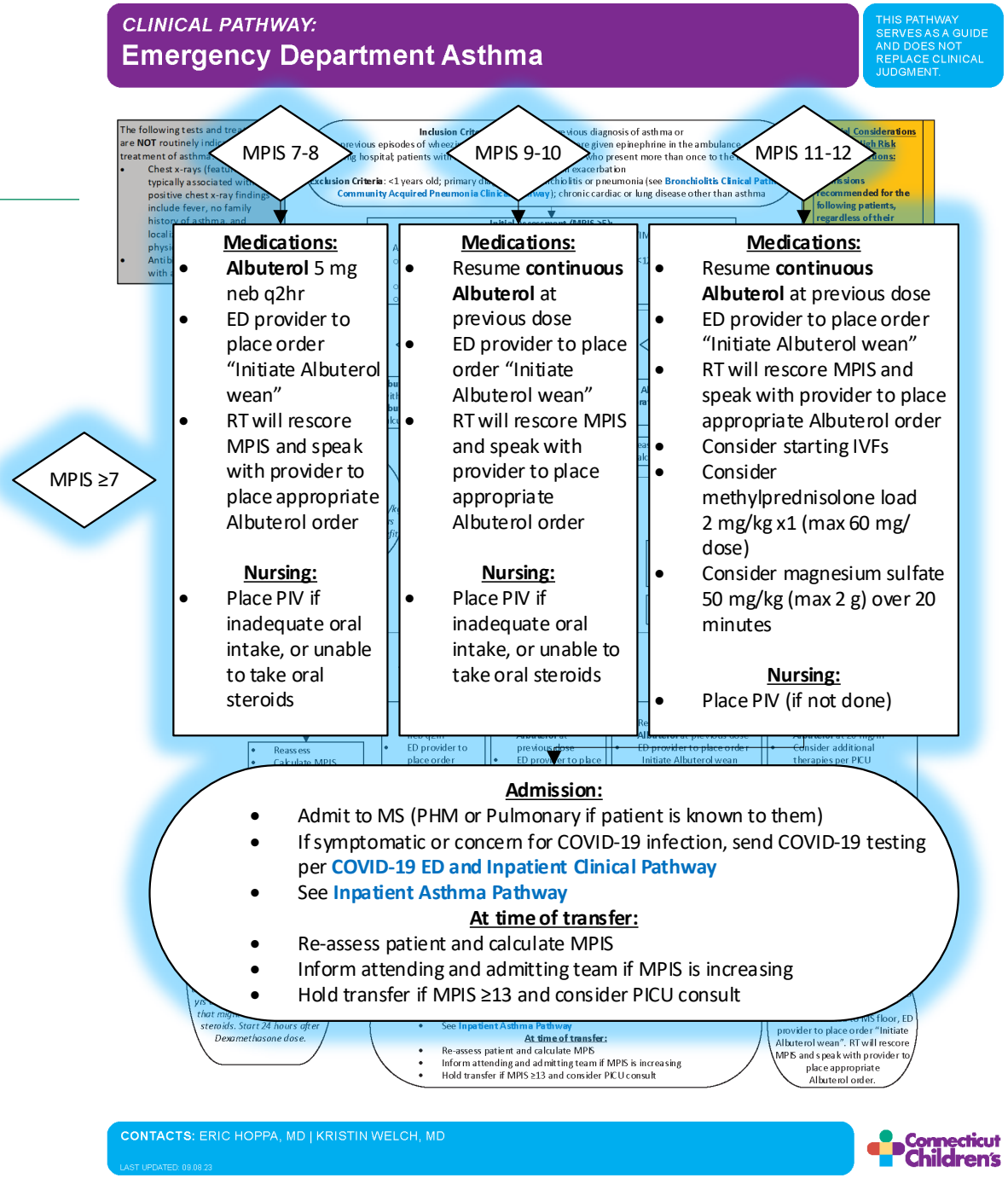
- **MPIS 7-12:** will require admission to MS Unit, to either PHM or Pulmonary
  - **MPIS 7-8:**
    - Intermittent Albuterol q2h for transfer, consider PIV
  - **MPIS 9-10:**
    - Continuous Albuterol for transfer, consider PIV
  - **MPIS 11-12:**
    - Continuous Albuterol for transfer, PIV recommended

- Patients with MPIS scores ≥9 are recommended to be placed on **continuous albuterol to avoid missing intermittent dosing** during time of transfer
- IVF should be considered for MPIS ≥11
- Note that methylprednisolone and magnesium sulfate was added as a consideration to MPIS 11-12 to decrease the potential for worsening clinical status



MPIS ≥13:

- **If MPIS worsens to ≥13**, these patients are considered more severely ill and should be stabilized and consider assessment by PICU team prior to transfer to MS unit
- Although there is no standardized methylprednisolone dosing available in the literature, a dosing consideration has been added here per agreement between ED, pulmonary, PICU and pharmacy representatives

Patients with an MPIS ≥12 have a 78% probability of being admitted to the PICU[6]

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Emergency Department Asthma

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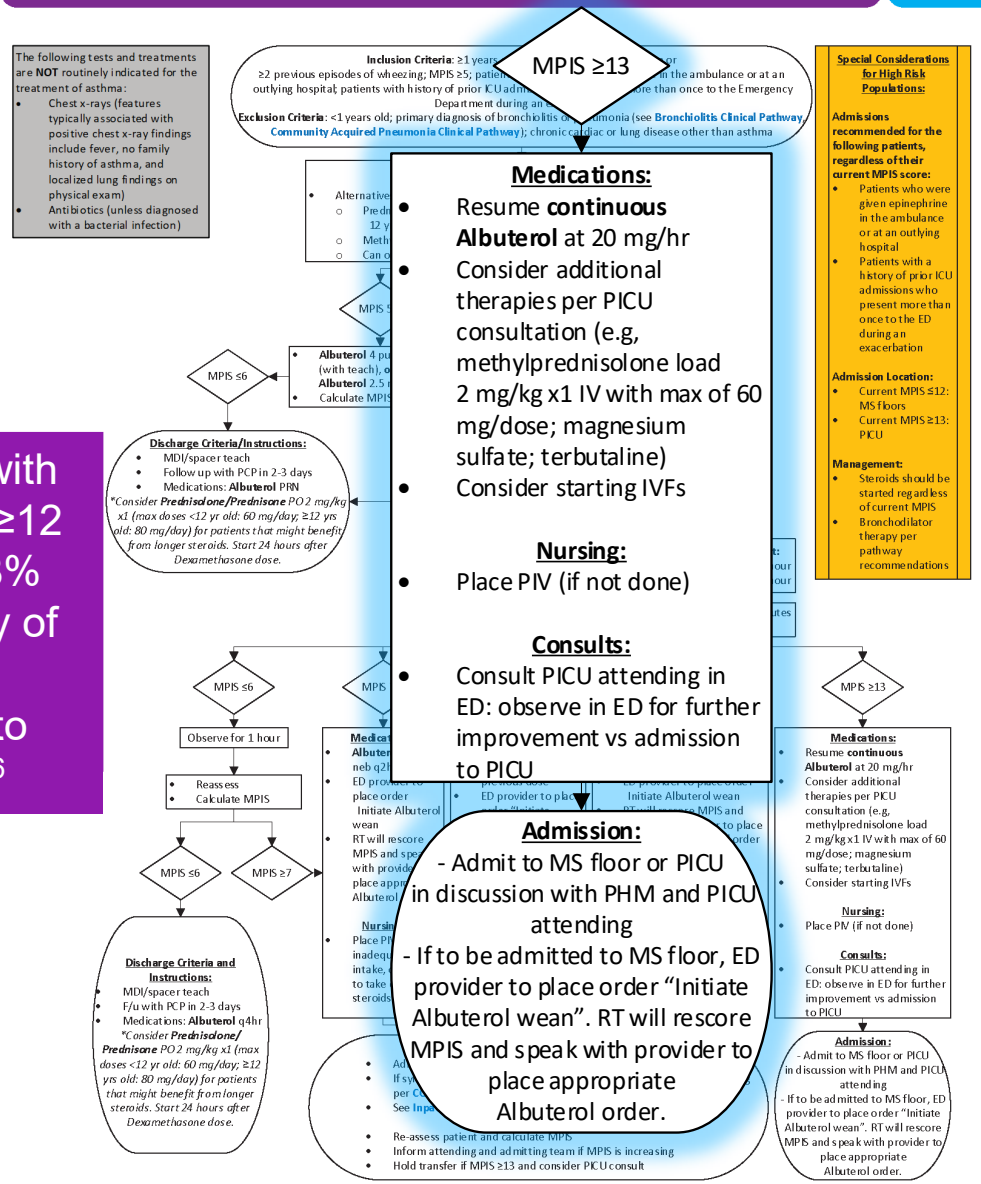

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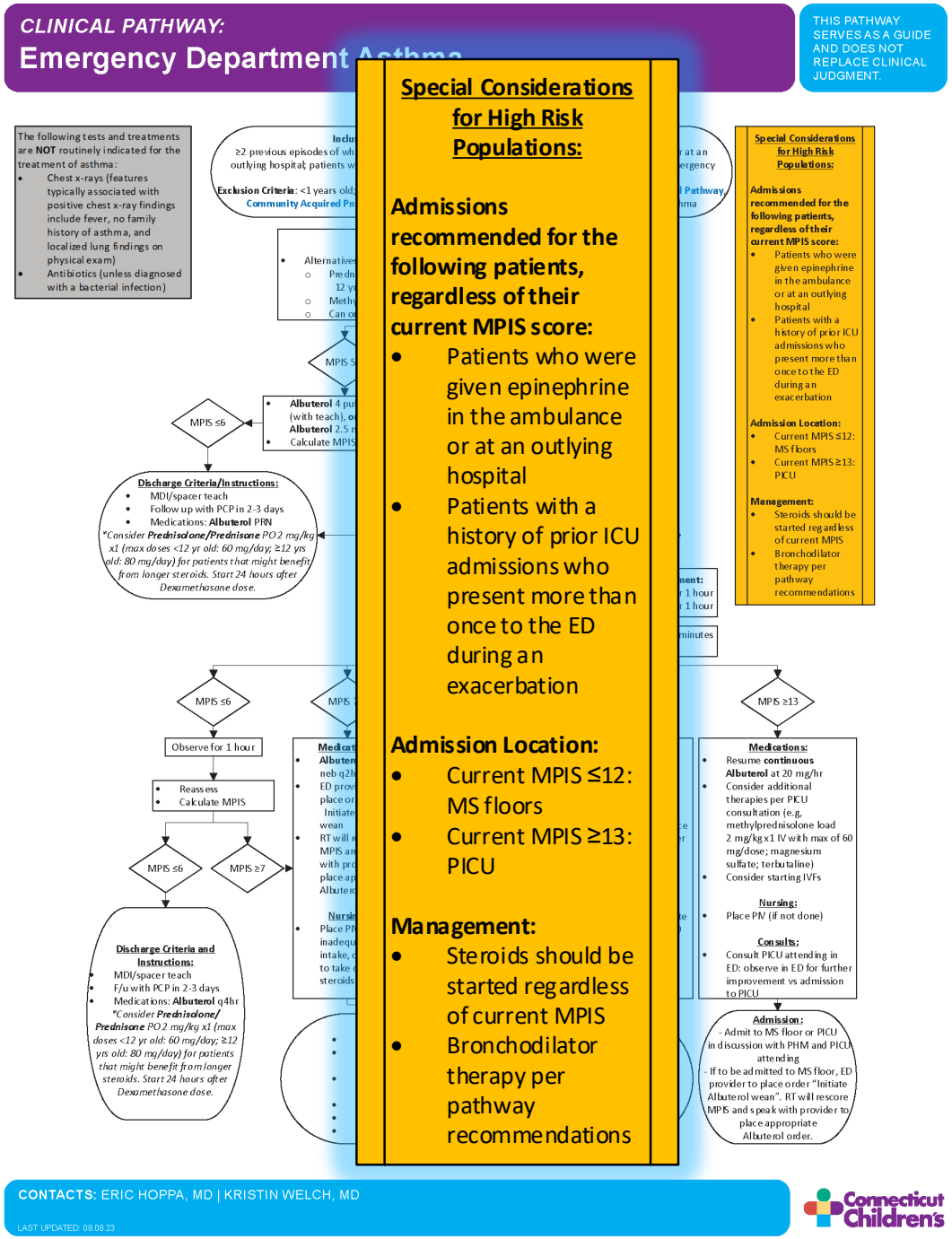
High Risk Populations:

- Some patients may be at increased risk of serious outcomes, even if their current MPIS scores may be reassuring/low. These include:
  - Patients who were given epinephrine prior to their presentation in the ED
  - Patients with a history of prior ICU admissions who present more than once to the ED during an exacerbation
- These patients are recommended to be admitted to the floors and have steroids started regardless of current MPIS score.
  - Bronchodilator therapy can be given per pathway recommendations.



This is the Inpatient Asthma Clinical Pathway.

We will be reviewing each component in the following slides.

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Inpatient Asthma

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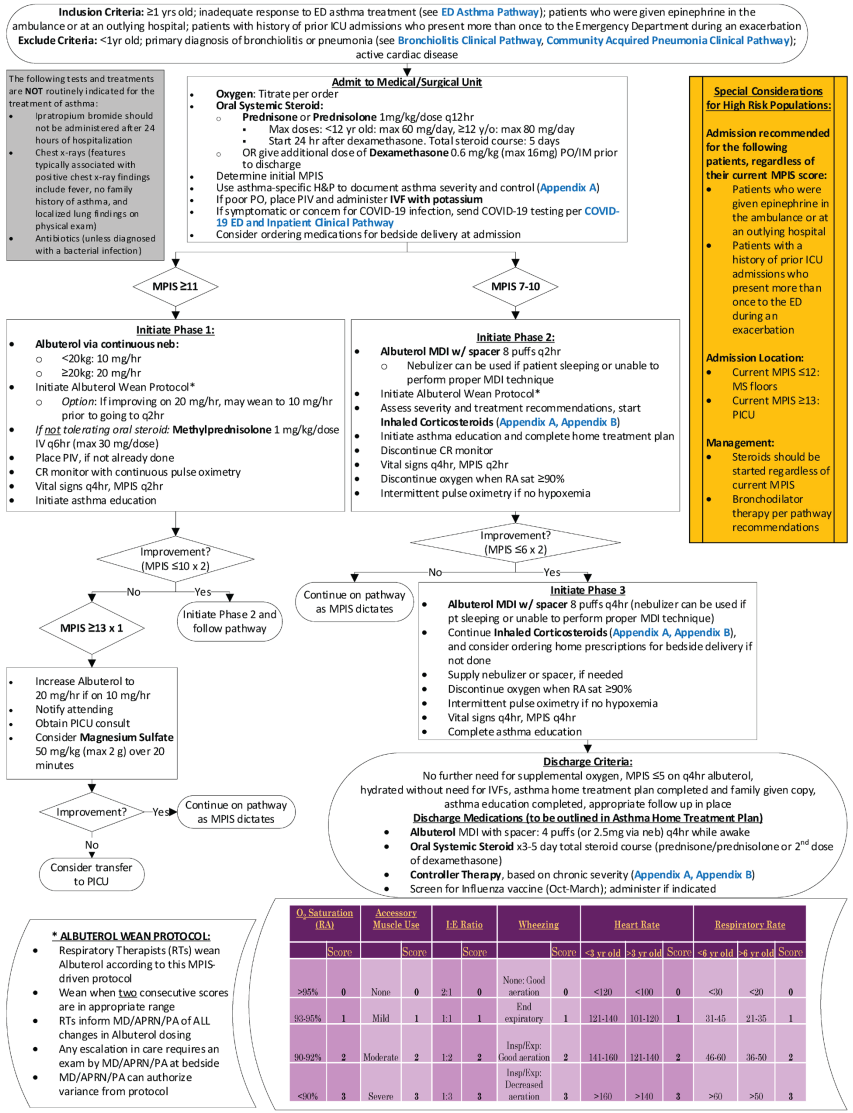

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CLINICAL PATHWAY:

Inpatient Asthma

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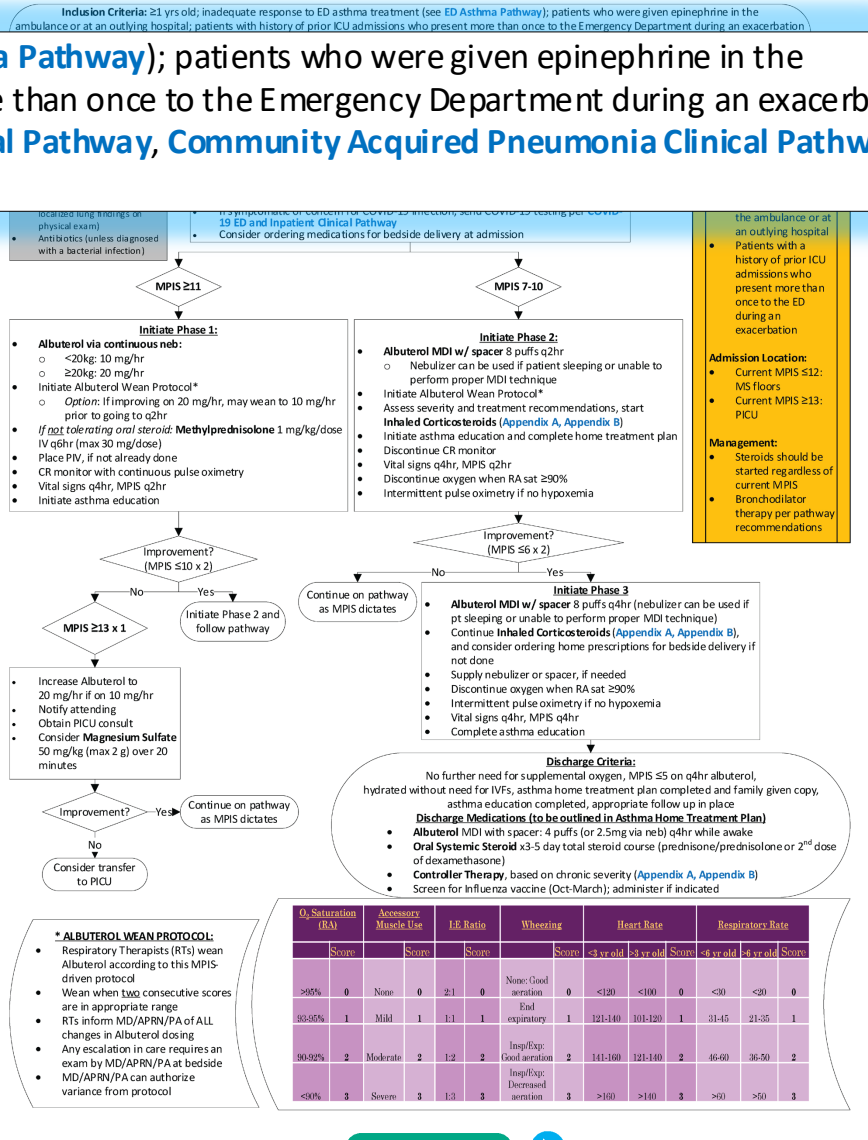
Inclusion Criteria: ≥1 yrs old; inadequate response to ED asthma treatment (see **ED Asthma Pathway**); patients who were given epinephrine in the ambulance or at an outlying hospital; patients with history of prior ICU admissions who present more than once to the Emergency Department during an exacerbation
Exclude Criteria: <1yr old; primary diagnosis of bronchiolitis or pneumonia (see **Bronchiolitis Clinical Pathway**, **Community Acquired Pneumonia Clinical Pathway**); active cardiac disease

- Patients who have a primary diagnosis other than asthma (such as bonchiolitis or pneumonia) are excluded from this pathway

Patients with pneumonia may still be included if the pneumonia is triggering asthma symptoms



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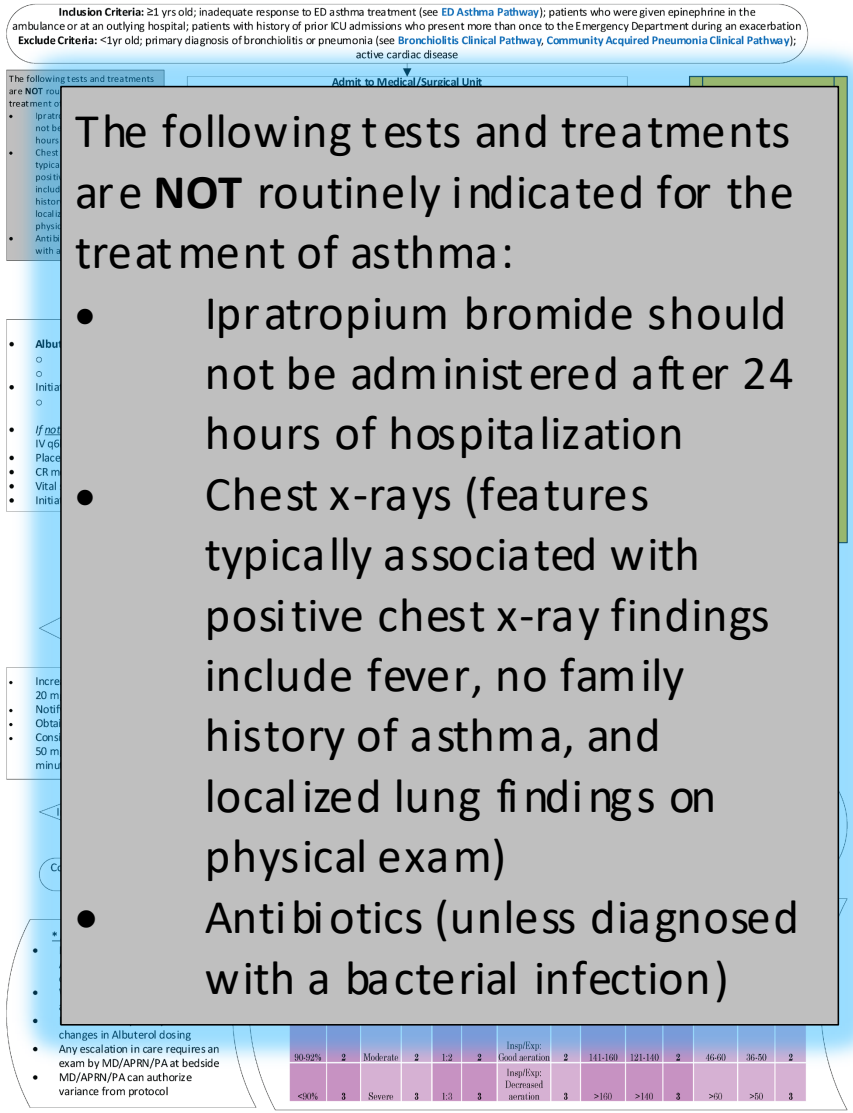
The following tests and treatments are NOT routinely indicated for the treatment of asthma:

- Ipratropium bromide should not be administered after 24 hours of hospitalization[7,8]
- Chest X-Rays[7]
- Antibiotics (unless diagnosed with a bacterial infection)[7,8,9]



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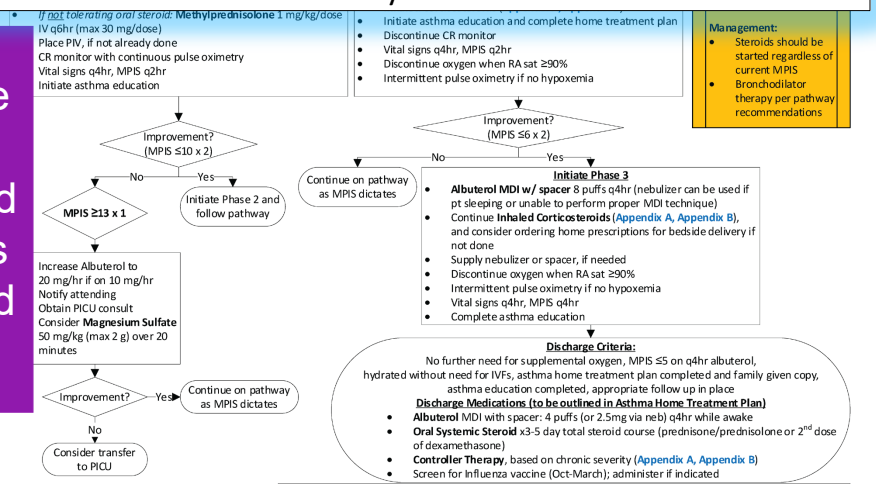
- **All inpatients will require additional dosing of systemic steroids**. There are 2 options, including prednisolone/prednisone or dexamethasone
  - Dexamethasone may be preferable given can prescribe a single additional dose 24h after initial dose in ED. This may be helpful for patient medication adherence and also for toddlers who have difficulty taking PO meds
- If patient did not have PIV placed in ED and appears dehydrated, consider PIV and initiation of IVFs

Dexamethasone is not inferior to Prednisone/Prednisolone; comes with other added benefits[10,11]

Admit to Medical/Surgical Unit

- **Oxygen**: Titrate per order
- **Oral Systemic Steroid:**
  - **Prednisone** or **Prednisolone** 1mg/kg/dose q12hr
    - Max doses: <12 yr old: max 60 mg/day, ≥12 y/o: max 80 mg/day
    - Start 24 hr after dexamethasone. Total steroid course: 5 days
  - OR give additional dose of **Dexamethasone** 0.6 mg/kg (max 16mg) PO/IM prior to discharge
- Determine initial MPIS
- Use asthma-specific H&P to document asthma severity and control (**Appendix A**)
- If poor PO, place PIV and administer **IVF with potassium**
- If symptomatic or concern for COVID-19 infection, send COVID-19 testing per **COVID-19 ED and Inpatient Clinical Pathway**
- Consider ordering medications for bedside delivery at admission



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- Remember that certain high risk populations may be at increased risk for serious outcomes and may be admitted regardless of their current MPIS.
- These patients should also be started on steroids regardless of their current MPIS.

CLINICAL PATHWAY:
Inpatient Asthma

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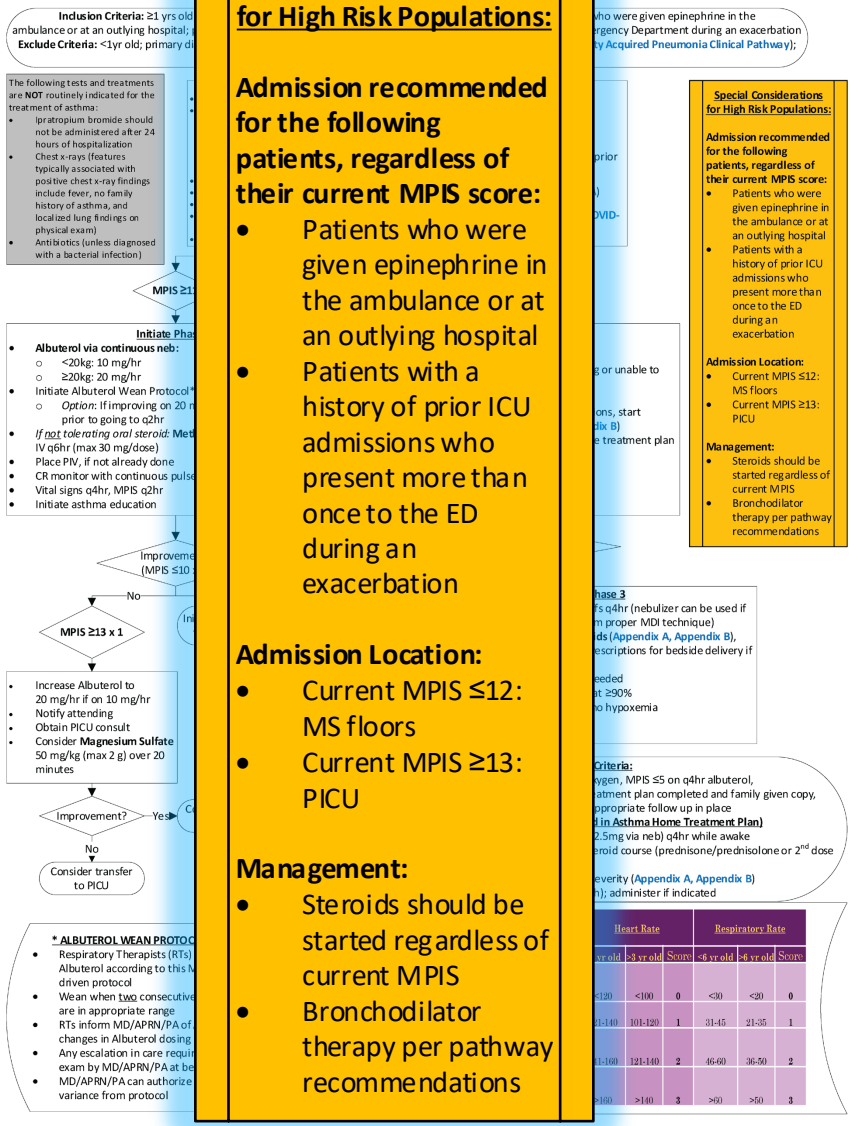

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- Use the Asthma-Specific H&P to document asthma severity and control
- Consider ordering medications for bedside delivery on admission

Using EMR reminders of control questions can improve accuracy of asthma severity and control assessment[12]

Medication adherence is one of the most important factors for asthma control, but refill rates for patients with asthma are low [7,13]

CLINICAL PATHWAY:

Inpatient Asthma

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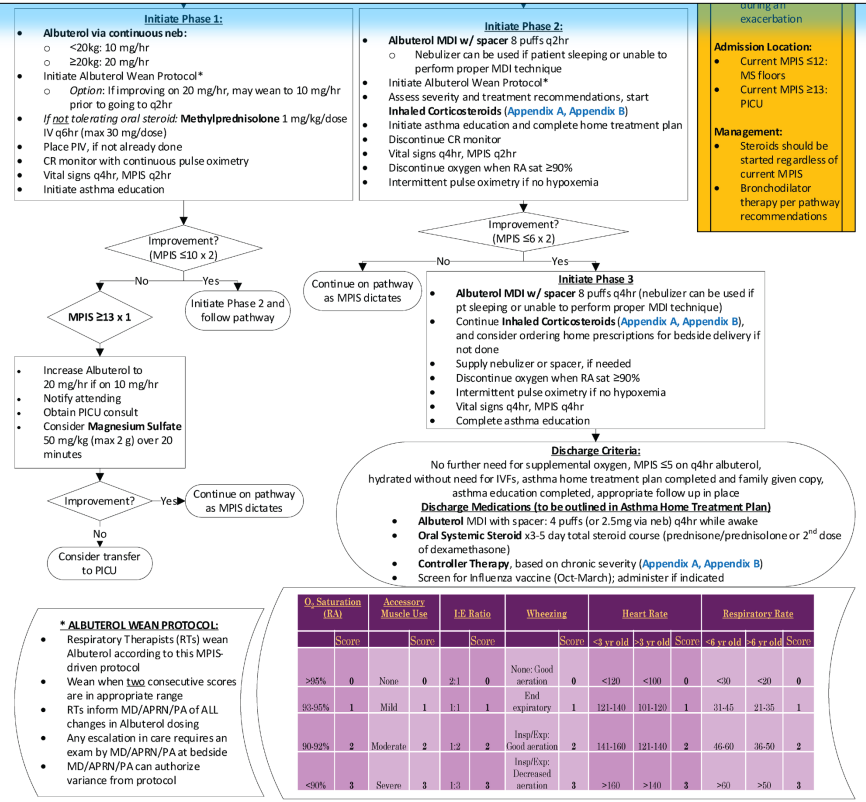

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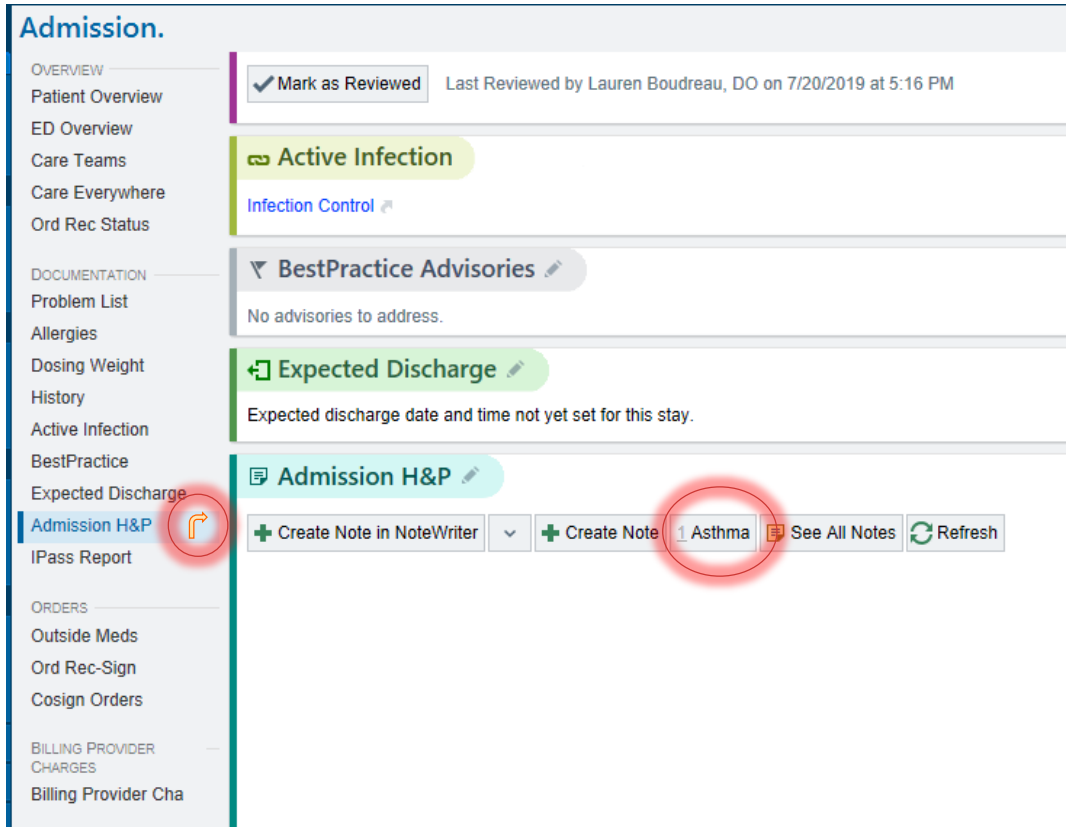
Asthma-Specific H&P



HISTORY OF PRESENT ILLNESS

***

Current Impairment

Patient reports

- Daytime symptoms {Day Symptoms :21825}
- Night-time awakening {Nightime Symptoms:2
- Limitation with normal activity {Limitations:21
- Albuterol use {Agonist Use:21828}
- Asthma triggers {Triggers:21839}

< or = 2 days per week	(intermittent)
> 2 days per week but not daily	(mild persistent)
daily	(moderate persistent)
throughout the day	(severe persistent)

Asthma Related Utilization

Patient reports

- Oral systemic corticosteroids use {0-5:140013} times per year.
- Urgent care/emergency department visit due to asthma in last year: {0-10:33138}
- Lifetime hospitalizations for asthma related illness: {NUMBERS; 0-10:5044}
- Lifetime ICU admissions for asthma related illness: {NUMBERS; 0-10:5044}
- Patient {HAS/HAS NOT:20194} required intubation due to asthma related illness.

Asthma Plan adherence

Patient reports

- Using a spacer with MDIs {yes/no:23206}
- Does patient follow well/sick plan > 80% of time {yes/no:23206}
- Last refill of albuterol: ***
- Last refill of controller medication: ***

Asthma Severity:

Based on the information provided, Thomas J Harris current asthma severity is {asthma severity:21829}

Asthma Control:

CLINICAL PATHWAY:

Inpatient Asthma

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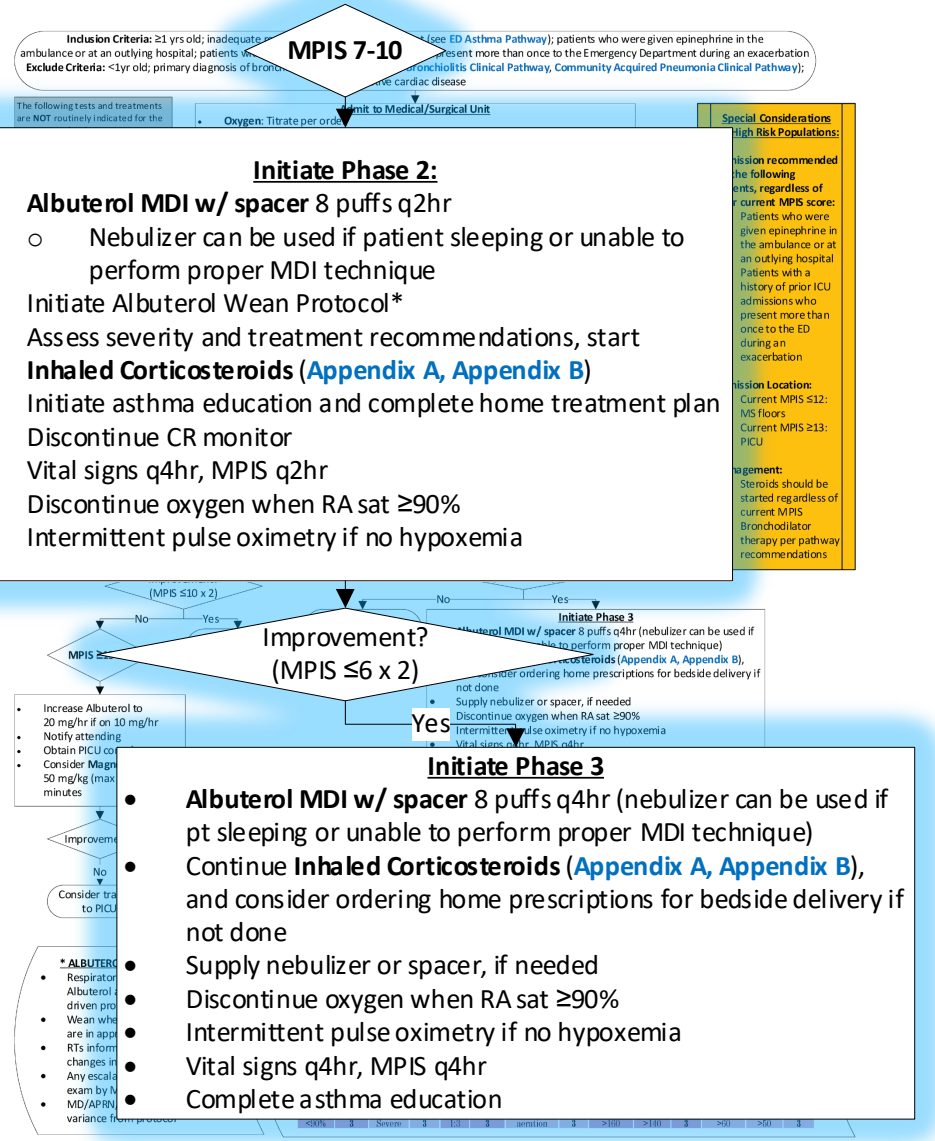
MPIS ≥11

Initiate Phase 1:

- **Albuterol via continuous neb:**
  - <20kg: 10 mg/hr
  - ≥20kg: 20 mg/hr
- Initiate Albuterol Wean Protocol*
  - *Option*: If improving on 20 mg/hr, may wean to 10 mg/hr prior to going to q2hr
- *If not tolerating oral steroid:* **Methylprednisolone** 1 mg/kg/dose IV q6hr (max 30 mg/dose)
- Place PIV, if not already done
- CR monitor with continuous pulse oximetry
- Vital signs q4hr, MPIS q2hr
- Initiate asthma education

- **Care is stratified across MPIS scores**
  - **Phase 1:** Continuous Albuterol
  - **Phase 2:** Intermittent Albuterol q2h
  - **Phase 3:** Intermittent Albuterol q4h



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Albuterol Wean Protocol

- Wean is directed by Respiratory Therapists
- This allows for prompt weaning of albuterol based on both subjective and objective data
- Protocol is MPIS-driven

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Inpatient Asthma

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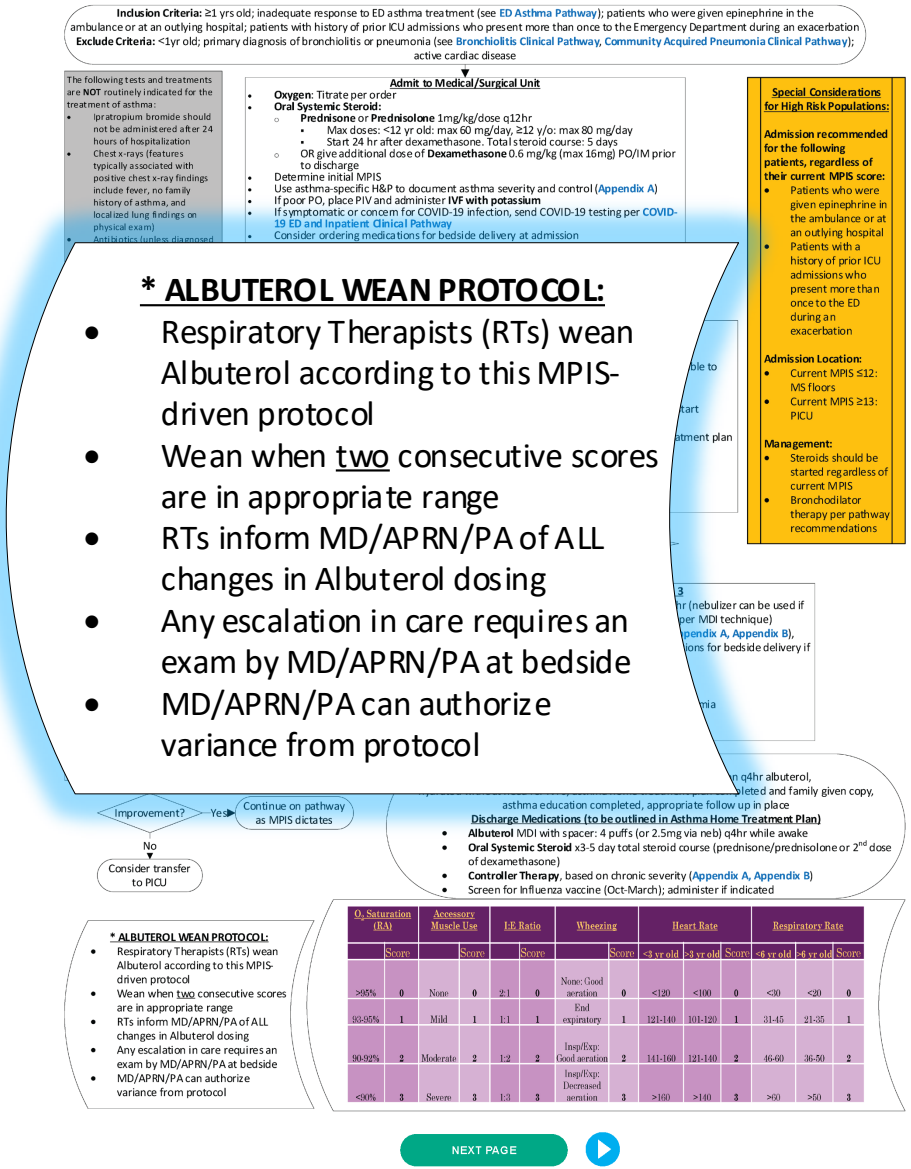

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If MPIS ≥ 11, Initiate Phase 1

- **Continuous albuterol**

- If not tolerating oral steroid, give **Methylprednisolone** IV
  - Note that the max dosing is now increased to 30 mg/dose!

- CR monitor w/continuous pulse oximetry
- Vital signs ≥ q4hr, MPIS q2h

- Initiate Asthma Education

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Inpatient Asthma

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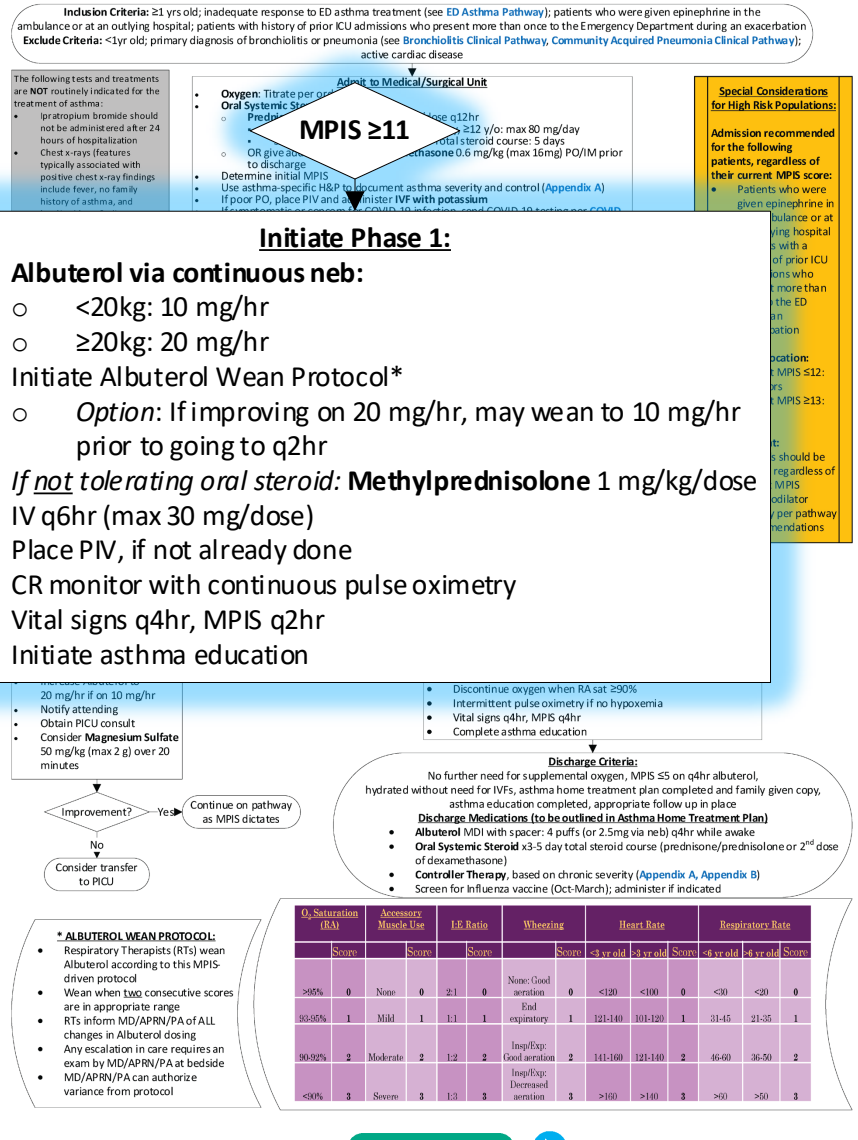

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Improvement after Phase 1 (Two consecutive scores in appropriate range)

- Initiate Phase 2 and follow pathway

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Inpatient Asthma

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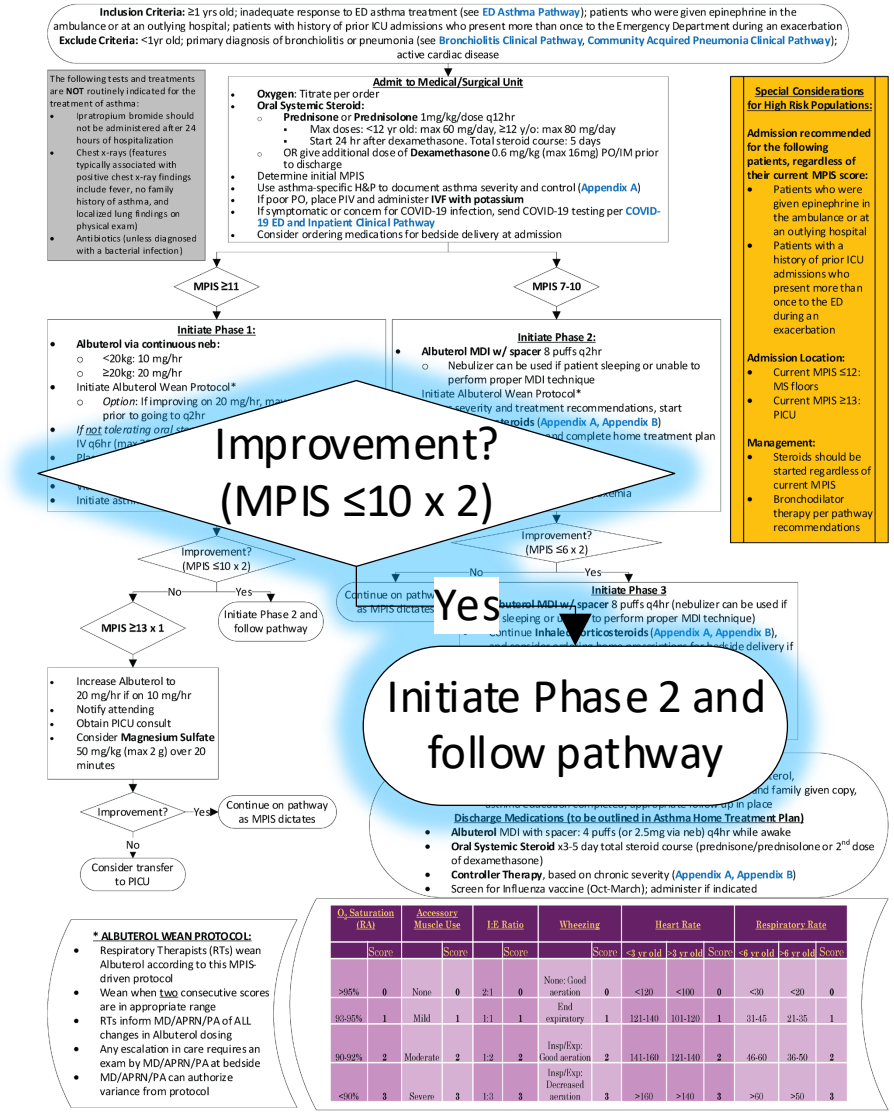

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CLINICAL PATHWAY:

Inpatient Asthma

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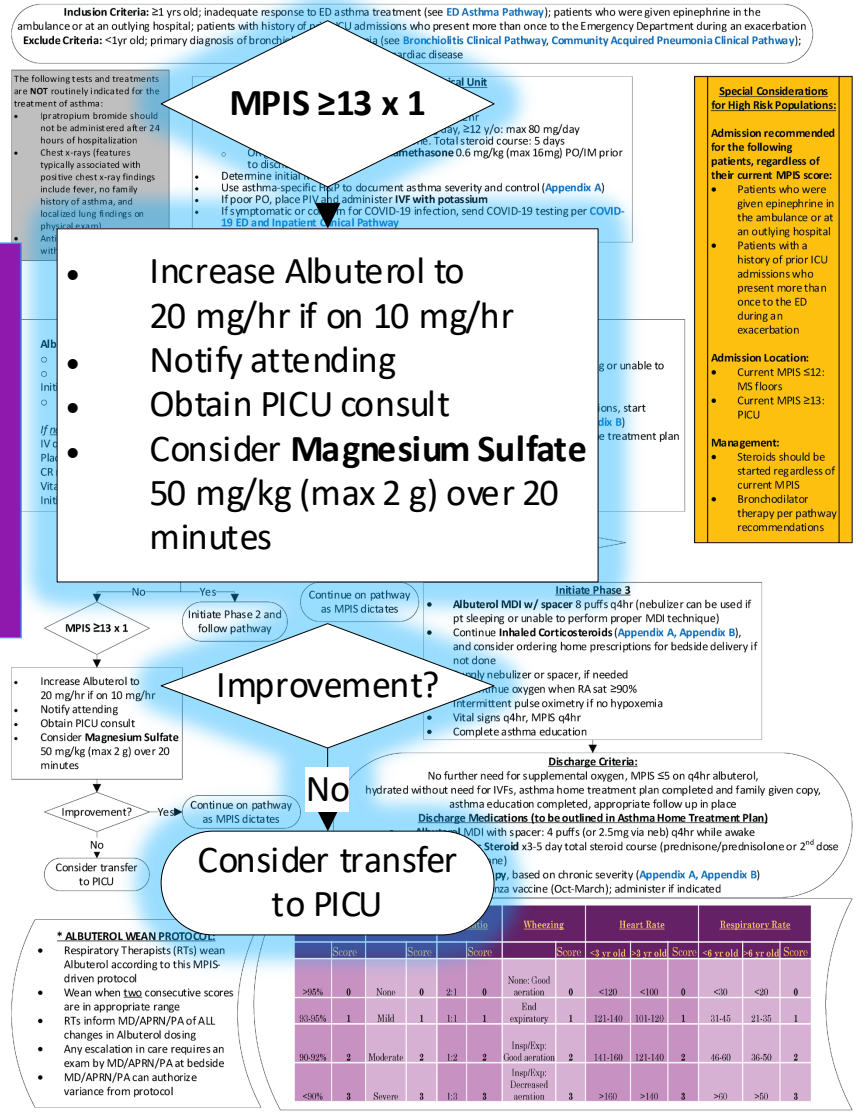
- **Children with an MPIS score ≥13 are considered to be quite ill and may require escalation of care**

- **Options for escalating care:**
  - Increasing Albuterol dosing
  - Adding IV Magnesium Sulfate
  - MET Activation/PICU Consult
  - PICU transfer

Patients with an MPIS ≥12 have a 78% probability of being admitted to the PICU[6]



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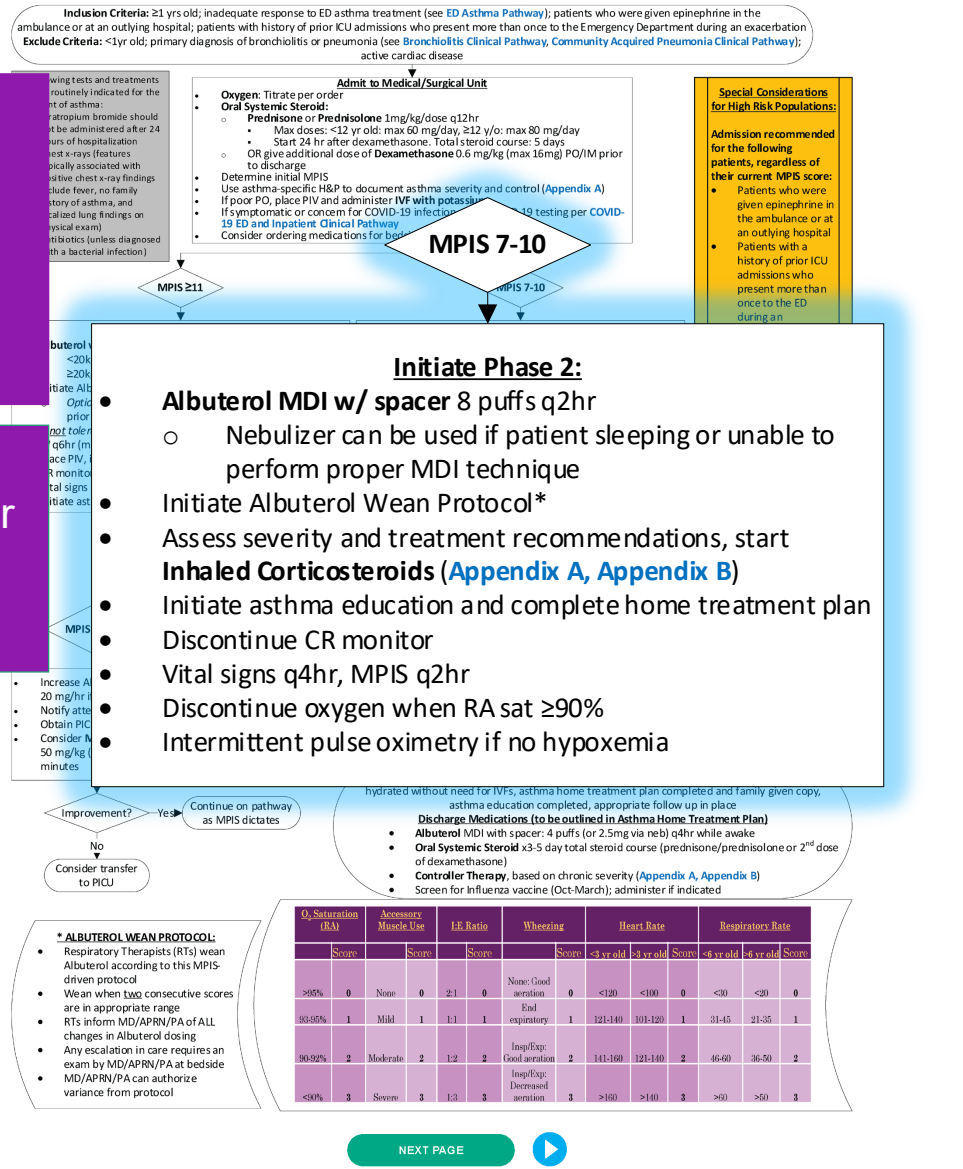
MPIS 7-10: Initiate Phase 2

- **Intermittent Albuterol treatments q2h**
- **Using an MDI w/ spacer is preferable** as this is likely what patients will be using at home.
- **Each albuterol treatment should be used as a teaching opportunity for asthma education and proper MDI technique.**
- Start **Inhaled Corticosteroids** based on Chronic Severity (see appendices)
- Discontinue CR monitor
- Discontinue O2 when RA sat ≥90%
- Intermittent pulse ox once off O2
- Home treatment plan (including controller ICS therapies) should be resumed

MDIs are more effective at delivering medication, including during exacerbations[12]

Parents frequently prefer MDIs to nebulizers[14,15]



MPIS ≤6: Initiate Phase 3

- **Intermittent Albuterol treatments q4h**
- **MDI w/ spacer is preferable**
- If patients are able to tolerate 2x q4h albuterol treatments they can be discharged as this is the regimen that is maintainable by parents at home

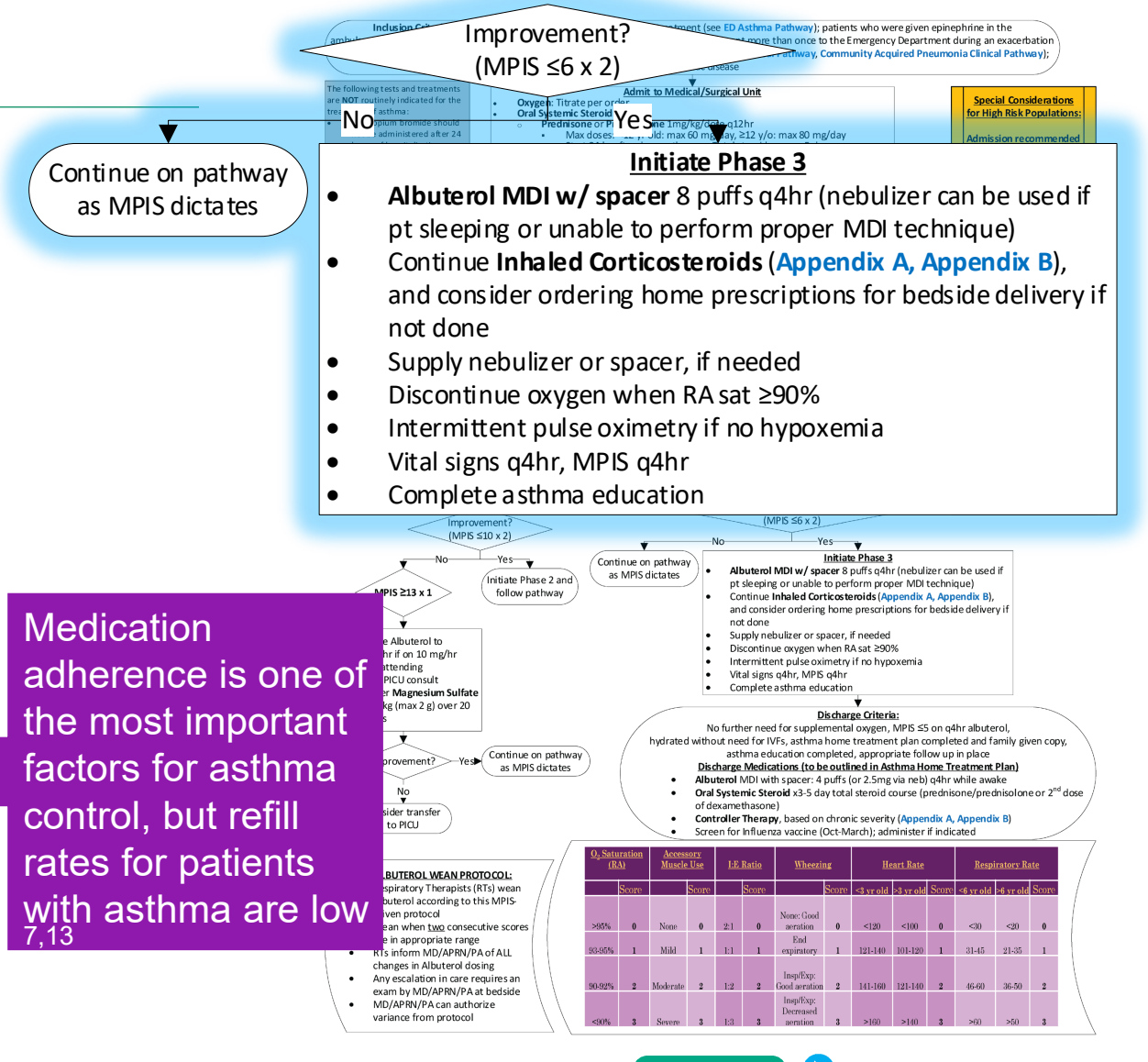
- Start **Inhaled Corticosteroids** based on Chronic Severity, if not yet done
- See Appendix for guidelines for recommendations on controller therapy
- Consider ordering medications for bedside delivery

- Complete Asthma Education
- Supply nebulizer or spacer if needed

Medication adherence is one of the most important factors for asthma control, but refill rates for patients with asthma are low [7,13]

CLINICAL PATHWAY:
Inpatient Asthma

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.



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- **Patients must meet all criteria prior to being discharged**
- Asthma Treatment Plan should completed and reviewed with family prior to discharge
- Patients should have a total of 3-5 day course of steroids
  - For mild to moderate asthma exacerbations, consider giving a second dose of dexamethasone prior to discharge to complete steroid course – benefits include increased compliance and tolerance
  - For moderate to severe exacerbations, consider ordering oral steroids
- **Patients should be screened for the influenza vaccination** prior to discharge and administered when appropriate

All children admitted for an asthma exacerbation should receive a review or initiation of an asthma action plan[8]

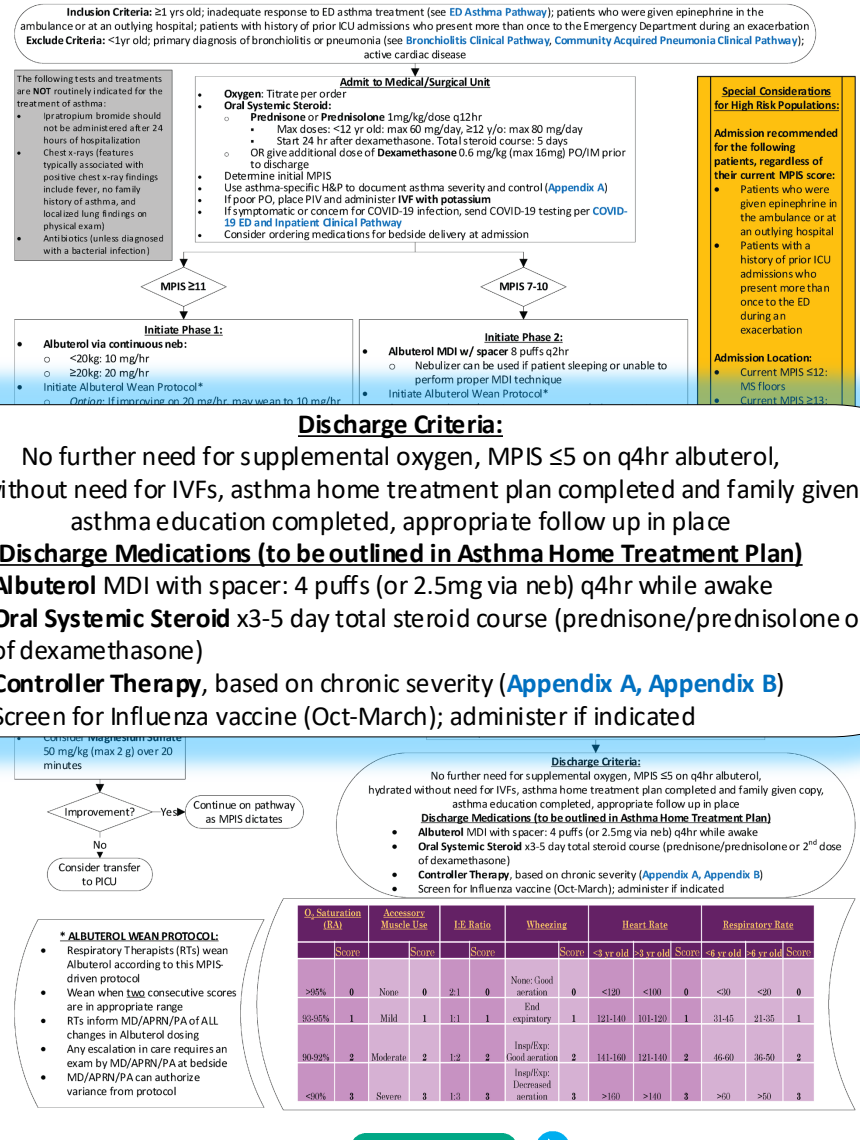
Dexamethasone is not inferior to Prednisone/ Prednisolone for mild to moderate exacerbations; comes with other added benefits[10,11]

During flu season children >6 months admitted for asthma exacerbation should have their flu vaccination status documented, and should have vaccine offered[8]

CLINICAL PATHWAY:

Inpatient Asthma

THIS PATHWAY SERVES AS A GUIDE AND DOES NOT REPLACE CLINICAL JUDGMENT.



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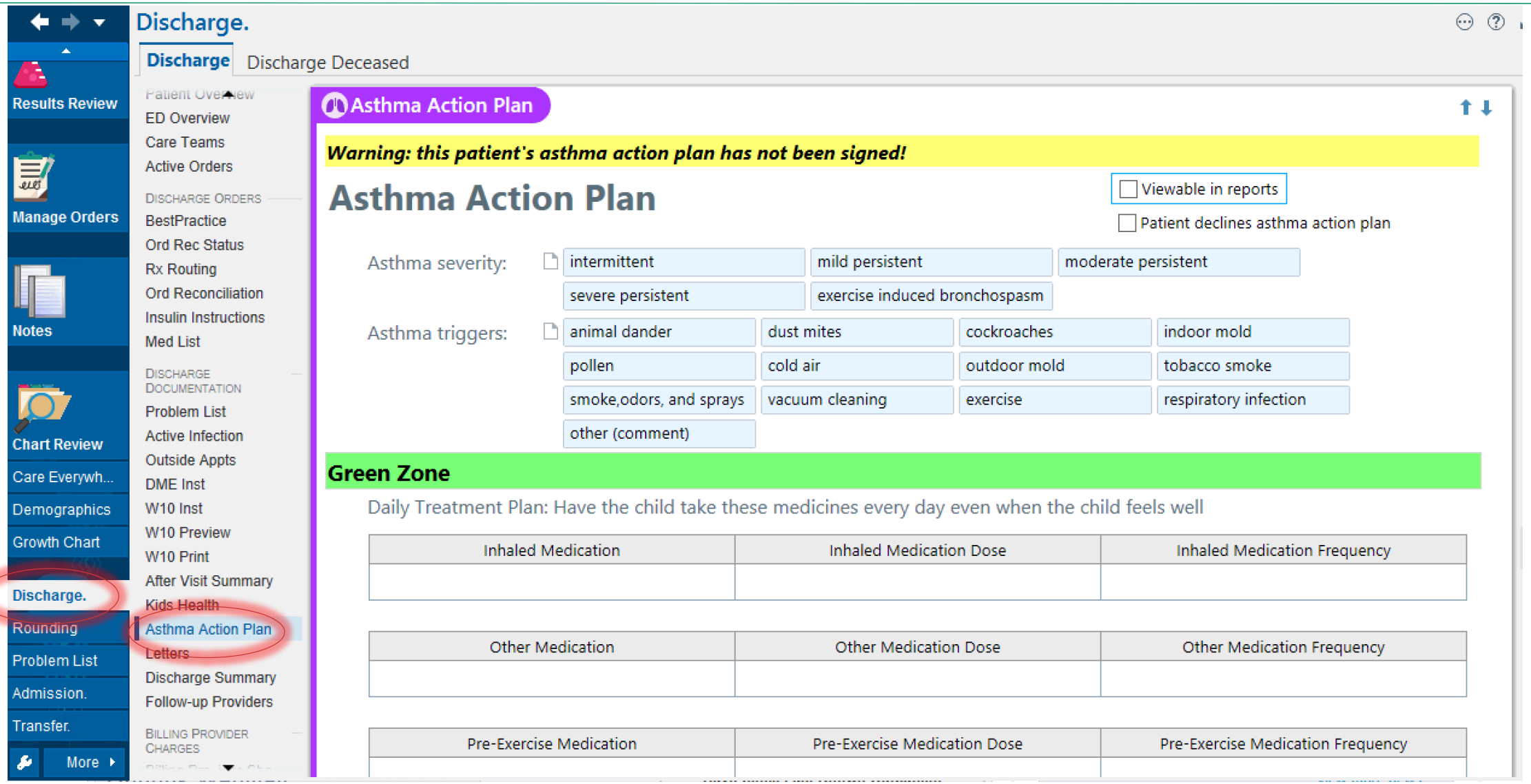
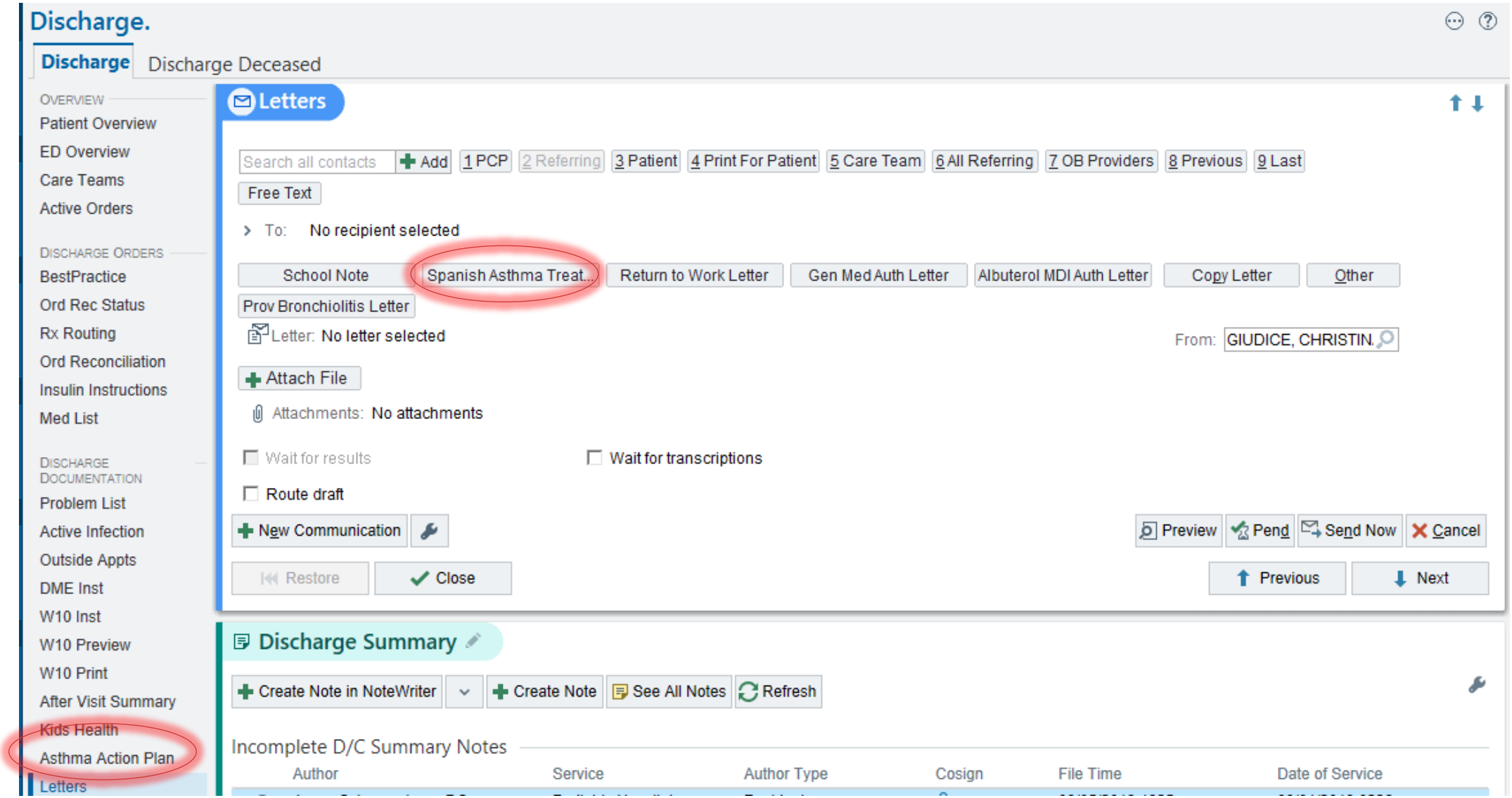
Asthma Action Plan - English



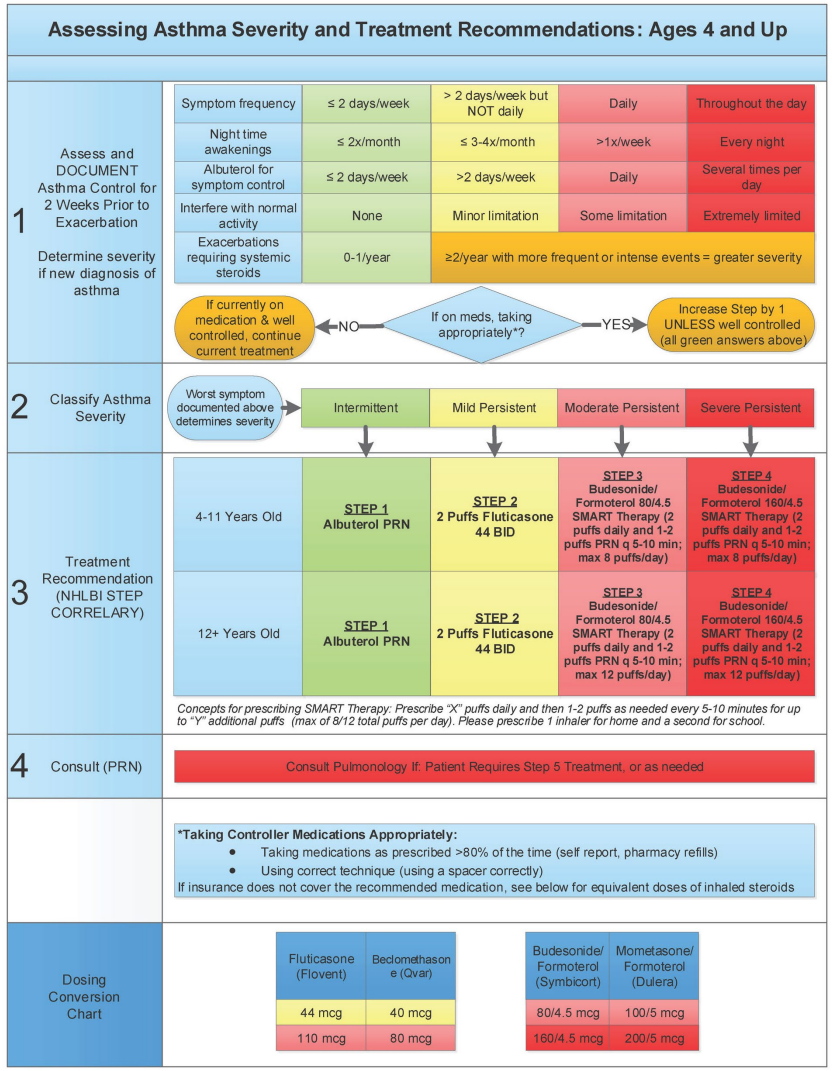
Asthma Action Plan - Spanish



Appendix A: Assessing Asthma Severity and Treatment Recommendations

- Providers may use this tool in conjunction with the Asthma-Specific H&P to determine appropriate stepwise treatment plan

1. Determine asthma control based on standardized questions (which should be documented in the Asthma-Specific H&P)
2. Classify asthma severity
3. Determine appropriate treatment
4. Consult as needed



RETURN TO THE BEGINNING

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Implementing SMART Therapy

Age	Budesonide/ formoterol dose	Moderate Persistent		Max puffs/ day
		Step 3	Step 4	
4-11 Maintenance Relief	80 µg/4.5	1 puff daily 1 puff prn	1 puff bid 1 puff prn	8
12+ Maintenance Relief	160µg/4.5	1 bid or 2 puffs daily 1 puff prn	2 puffs bid 1 puff prn	12
Total daily ICS		< 400 µg/day (medium)	400-800 µg/day (high)	

Single Maintenance and Reliever Therapy (SMART)[10]

- Use of ICS-formoterol in a single inhaler used as both daily controller and quick-relief therapy for children ages 4 years and older with moderate to severe persistent asthma
- **Target population:** Individuals 4 years and older with a severe exacerbation in the prior year are particularly good candidates for SMART to reduce exacerbations.
- **Who should *not* receive this treatment:** Do not use ICS-formoterol as reliever therapy in individuals taking ICS-salmeterol as maintenance therapy.

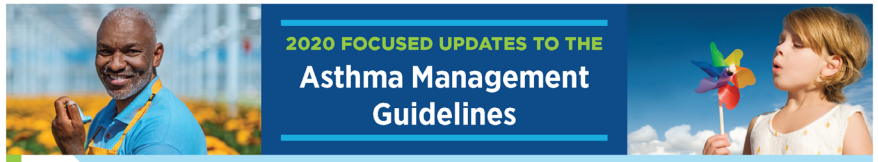
Who should be treated with SMART? [10]

- Anyone 4 yrs and older with moderate, persistent asthma
- Whose asthma is inadequately controlled on ICS plus SABA daily or intermittently (ie, treatment for mild to moderate persistent asthma)
- Benefits:
- -Reduces exacerbations requiring systemic corticosteroids (35-51%)
- -Reduces overall steroid exposure

- Treatment plans used in studies (O'Byrne, Rabe, Sciccitano)
  - Fluticasone/formoterol (80/4.5) 1 puff every day (or bid) and 1 puff as-needed and before exercise up to 8 puffs/day (ages 4-11 yrs)
  - Fluticasone/formoterol (80/4.5) 1 puff every day (or bid) and 1 puff as-needed and before exercise up to 12 puffs/day (ages 12+ years)
  - Fluticasone/formoterol (160/4.5) 2 puffs every day and 1 or 2 puffs as-needed and before exercise up to 12 puffs/day (ages 12+ yrs)

Appendix B: National Heart, Lung, and Blood Institute (NHLBI) Asthma Management Guidelines

- Addresses long-term asthma management for Home Treatment Plan of Care
- Therapy is stratified by age and severity
- Outlines how to step up or step down in therapy
- Goals: Reduce impairment and reduce risk



AT-A-GLANCE GUIDE

This At-A-Glance Guide describes a treatment management approach based on recommendations from the *2020 Focused Updates to the Asthma Management Guidelines: A Report from the National Asthma Education and Prevention Program Coordinating Committee Expert Panel Working Group*.[1] Step diagrams from the 2007 Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma (EPR-3) were updated with the new recommendations. The diagrams are intended to help clinicians integrate the new recommendations into clinical care, and are meant to assist, and not replace, clinical judgment or decision-making for individual patient management, with input from individuals with asthma about their preferences.

AGES 0–4 YEARS: STEPWISE APPROACH FOR MANAGEMENT OF ASTHMA

	Intermittent Asthma	Management of Persistent Asthma in Individuals Ages 0–4 Years				
Treatment	STEP 1	STEP 2	STEP 3	STEP 4	STEP 5	STEP 6
Preferred	PRN SABA and At the start of RTI: Add short course daily ICS▲	Daily low-dose ICS and PRN SABA	Daily medium-dose ICS and PRN SABA	Daily medium-dose ICS-LABA and PRN SABA	Daily high-dose ICS-LABA and PRN SABA	Daily high-dose ICS-LABA + oral systemic corticosteroid and PRN SABA
Alternative		Daily montelukast* or Cromolyn,* and PRN SABA		Daily medium-dose ICS + montelukast* and PRN SABA	Daily high-dose ICS + montelukast* and PRN SABA	Daily high-dose ICS + montelukast*+ oral systemic corticosteroid and PRN SABA
			For children age 4 years only, see Step 3 and Step 4 on Management of Persistent Asthma in Individuals Ages 5–11 Years diagram.			

Assess Control

- First check adherence, inhaler technique, environmental factors,▲ and comorbid conditions.
- **Step up** if needed; reassess in 4–6 weeks
- **Step down** if possible (if asthma is well controlled for at least 3 consecutive months)

Consult with asthma specialist if Step 3 or higher is required. Consider consultation at Step 2.

Control assessment is a key element of asthma care. This involves both impairment and risk. Use of objective measures, self-reported control, and health care utilization are complementary and should be employed on an ongoing basis, depending on the individual's clinical situation.

Abbreviations: ICS, inhaled corticosteroid; LABA, long-acting beta$_2$-agonist; SABA, inhaled short-acting beta$_2$-agonist; RTI, respiratory tract infection; PRN, as needed

▲ Updated based on the 2020 guidelines.

* Cromolyn and montelukast were not considered for this update and/or have limited availability for use in the United States. The FDA issued a Boxed Warning for montelukast in March 2020.

[1]The full-length report, *2020 Focused Updates to the Asthma Management Guidelines: A Report from the National Asthma Education and Prevention Program Coordinating Committee Expert Panel Working Group*, can be accessed at **nhlbi.nih.gov/asthmaguidelines**.

U.S. Department of Health and Human Services
National Institutes of Health
National Heart, Lung, and Blood Institute

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Review of Key Points

- Patients with a primary diagnosis of pneumonia or bronchiolitis are excluded from these pathways
- Using the Asthma-Specific H&P on admission in conjunction with Appendix A allows the admitting provider to determine the discharge medication plan on admission
- Respiratory Therapists may independently wean albuterol according to this MPIS-driven protocol. MD/APRN/PA is informed of ALL changes in Albuterol dosing, is required to complete a bedside exam if there is any escalation in care, and can authorize variance from protocol

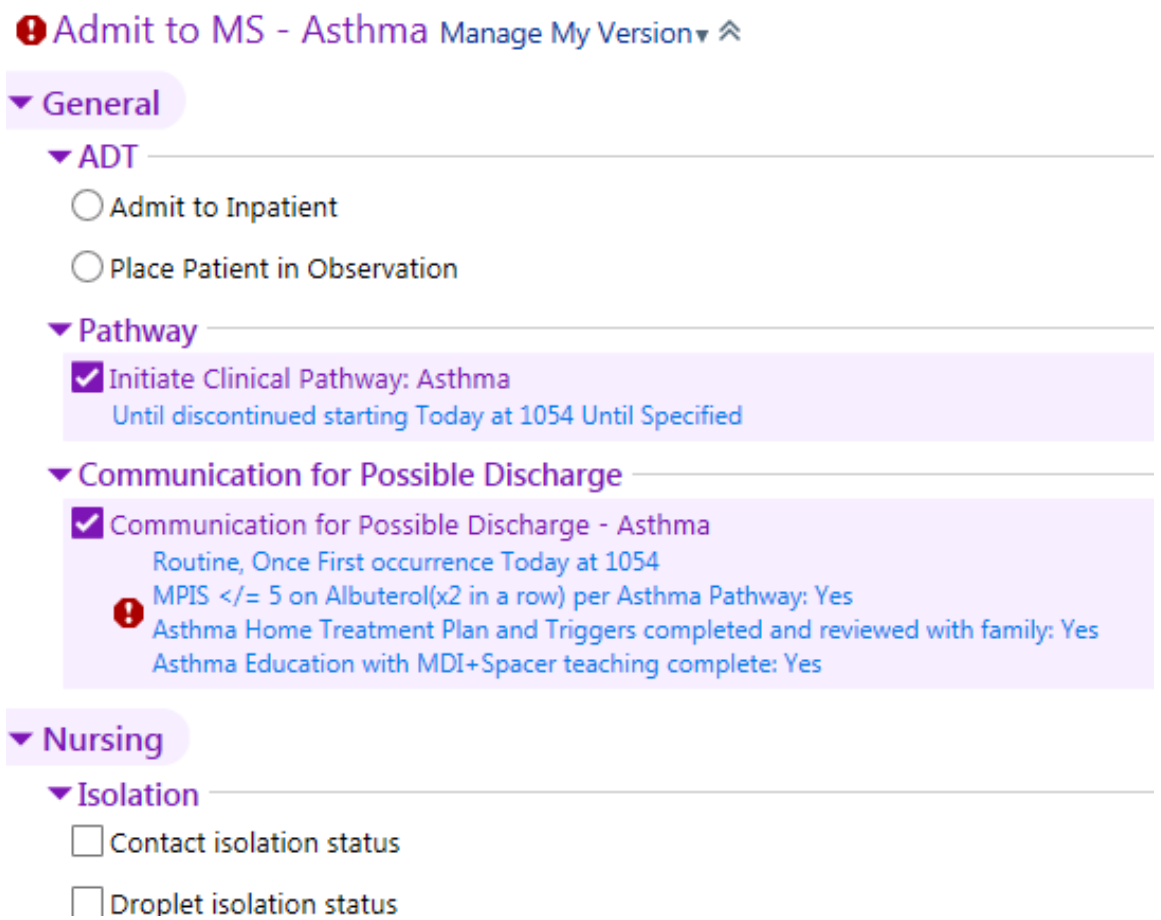
Review of Key Points

- Inhaled corticosteroids based on chronic severity should be initiated in Phase 2/3 of Inpatient pathway, using the answers in the Asthma Specific H&P and recommendations in Appendix A
- Every child should be screened for flu vaccine (when appropriate) and given an Asthma Action Plan prior to discharge
- Patients should be prescribed (when appropriate) an inhaled corticosteroid based on recommendations from National Asthma Education and Prevention Program (guidelines in appendix of pathway)

Use of Order Set

You can choose to either “Admit to Inpatient” or “Place Patient in Observation”.
If there are questions on which order is appropriate, please consult your Case Manager.

Note: “Initiate Clinical Pathway: Asthma” is pre-selected. This allows for Quality Metric tracking



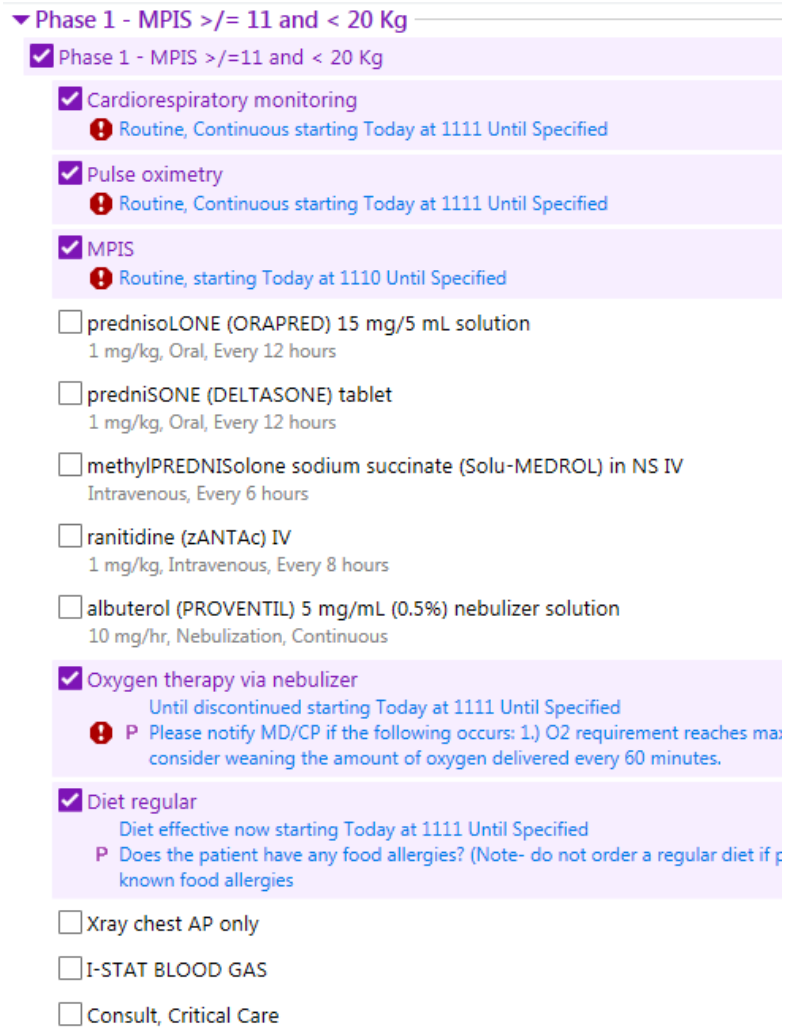
Use of Order Set

Each phase of the Inpatient Asthma Pathway is listed as an option, based on the MPIS score and, for Phase 1, weight.

Use of Order Set

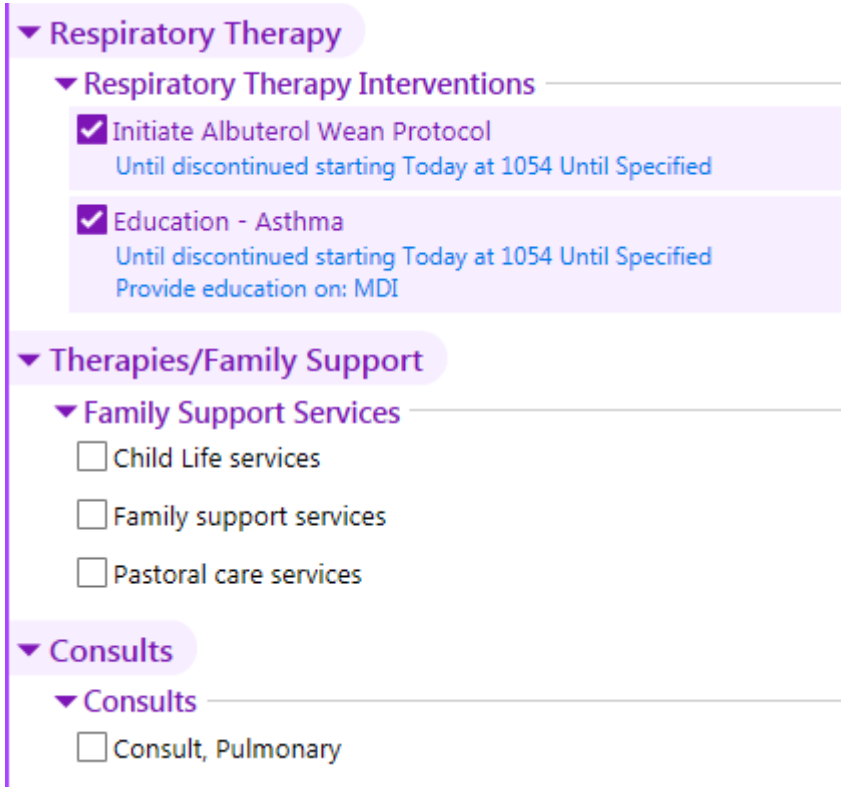
All medications mentioned on the Inpatient Asthma pathway/algorithm are listed as an option in the order set. Note that all dosing recommendations are easily visible upon selection.

Within each phase, there are suggested orders including some that are pre-checked as they are the standard of care, and others which are not because they are not routinely recommended (for example, X-rays)



Use of Order Set

Orders for Respiratory Therapists including Initiating Albuterol Wean Protocol and Asthma Education, are pre-checked so that RTs may wean albuterol and family teaching can begin as soon as possible after admission.



Quality Metrics

ED

- Percentage of patients with order set use
- Percentage of patients treated for asthma in the ED who are admitted as inpatient or placed in observation status
- Average time from arrival to administration of systemic steroids
- Mean length of stay for patients discharged from the ED (hours)
- Percentage of patients who receive first steroids within 60 minutes or less
- Number of transfers to the Pediatric Intensive Care Unit within 12 hours of admission
- Returns to the ED (treat and release) within 48 hours with asthma diagnosis
- Returns to the ED (treat and release) within 7 days with asthma diagnosis
- Number of patients with >1 ED visit in 7 days **and** PICU admission within last 2 years who are NOT admitted

INPATIENT

- Percentage of patients with order set use
- Percentage of patients > = 5 years of age discharged on a controller medication
- Percentage of patients who were given a complete HMPC (Home Management Plan of Care)
- Mean length of stay (days)
- Readmissions within 7 days
- Readmissions within 30 days
- Readmissions within 6 months

References

- [1]"Asthma's Impact on the Nation: Data from the CDC National Asthma Control Program." *Centers for Disease Control and Prevention,* 2018, www.cdc.gov/asthma/impacts_nation/asthmafactsheet.pdf
- [2]"Asthma Prevalence in the United States." (2014). *National Center for Environmental Health Division of Environmental Health and Health Effects,* www.cdc.gov/asthma/speakit/epidemiologyrevised.pptx.ppt
- [3]Miller AG, Breslin ME, Pineda LC, Fox JW. An asthma protocol improved adherence to evidence-based guidelines for pediatric subjects with status asthmaticus in the emergency department. *Resp Care*, 2015; *60*(12):1759–64.
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- [6]Carroll CL, Sekaran AK, Lerer TJ, Schramm CM. A modified pulmonary index score with predictive value for pediatric asthma exacerbations. *Ann Allergy Asthma Immunol, 2005 Mar; 94(3):* 355-59.
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- [8]National Heart Lung and Blood Institute National Asthma Education and Prevention Program. Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma. 2007. Available from: http://www.nhlbi.nih.gov/guidelines/asthma/asthgdln.htm.
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- [10] Cloutier MM, Baptist AP, Blake K V., et al. 2020 Focused Updates to the Asthma Management Guidelines: A Report from the National Asthma Education and Prevention Program Coordinating Committee Expert Panel Working Group. J Allergy Clin Immunol. 2020;146(6):1217-1270. doi:10.1016/j.jaci.2020.10.003

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Thank You!

About Connecticut Children's Pathways Program

Clinical pathways guide the management of patients to optimize consistent use of evidence-based practice. Clinical pathways have been shown to improve guideline adherence and quality outcomes, while decreasing length of stay and cost. Here at Connecticut Children's, our Clinical Pathways Program aims to deliver evidence-based, high value care to the greatest number of children in a diversity of patient settings. These pathways serve as a guide for providers and do not replace clinical judgment.