



Asthma Clinical Pathways: Emergency Department & Inpatient

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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 years¹
- In 2010, 58.3% of children with asthma had at least one asthma attack in the previous twelve months²
- Nearly 20% of children diagnosed with asthma went to an ED for care in 2009³
- Asthma is the third ranking cause of hospitalization for children and one of the leading causes of school absenteeism, approximately 12.8 million school days⁴
- Less than half of all children with asthma have an asthma action plan¹
- Clinical pathways for asthma can decrease LOS, costs, and unnecessary antibiotic use without increasing rates of readmissions, leading to higher value care⁵

Modified Pulmonary Index Score⁶

- 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 Score⁶



Appendix A: Modified Pulmonary Index Score (MPIS) Chart



Appendix A of the pathway now includes a chart to understand exactly how an MPIS is calculated

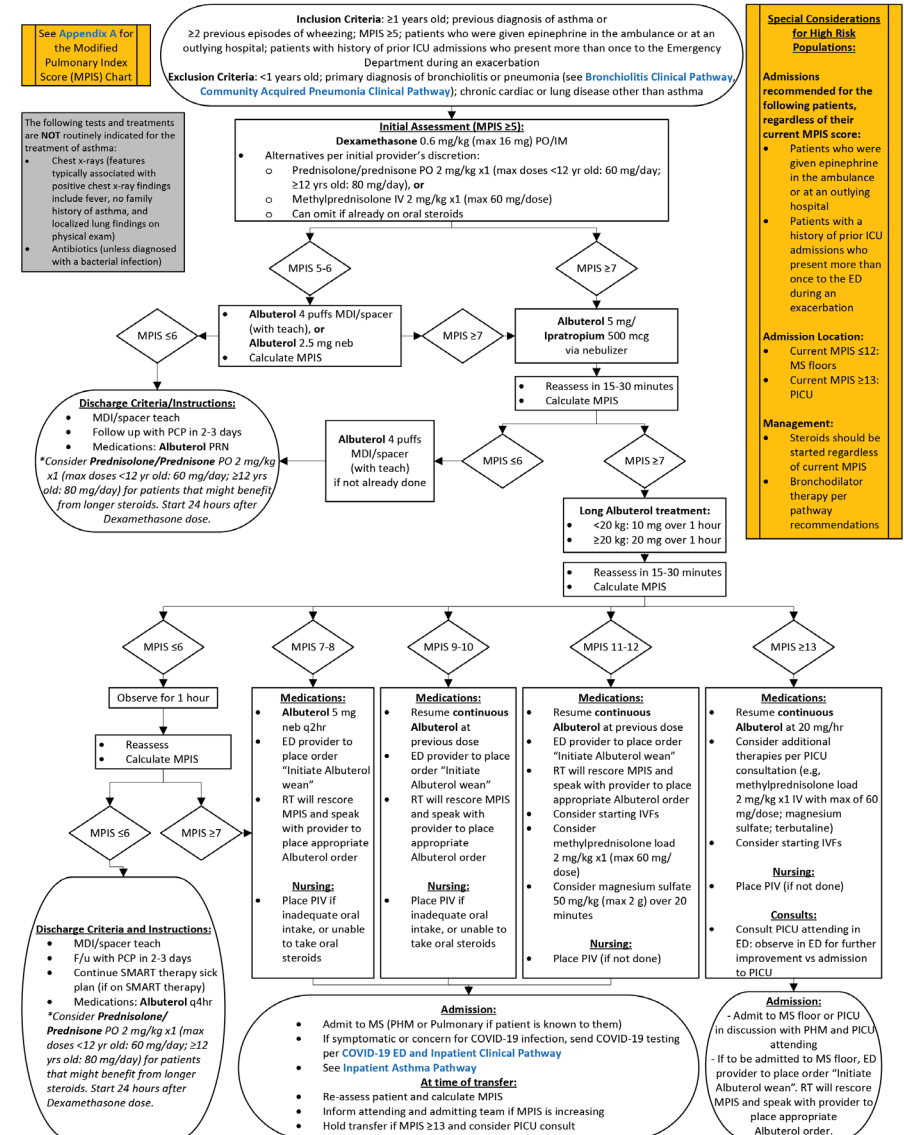
Score	O ₂ Saturation (RA)	Accessory Muscle Use	I:E Ratio	Wheezing	Heart Rate		Respiratory Rate	
					<3 years old	≥3 years old	>6 years old	≥6 years old
0	>95%	None	2:1	None: Good aeration	≤120	≤100	≤30	≤20
1	93-95%	Mild	1:1	End expiratory	121-140	101-120	31-45	21-35
2	90-92%	Moderate	1:2	Insp/Exp: Good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

This is the Emergency Department Asthma Clinical Pathway.

We will be reviewing each component in the following slides.

CLINICAL PATHWAY: Emergency Department Asthma

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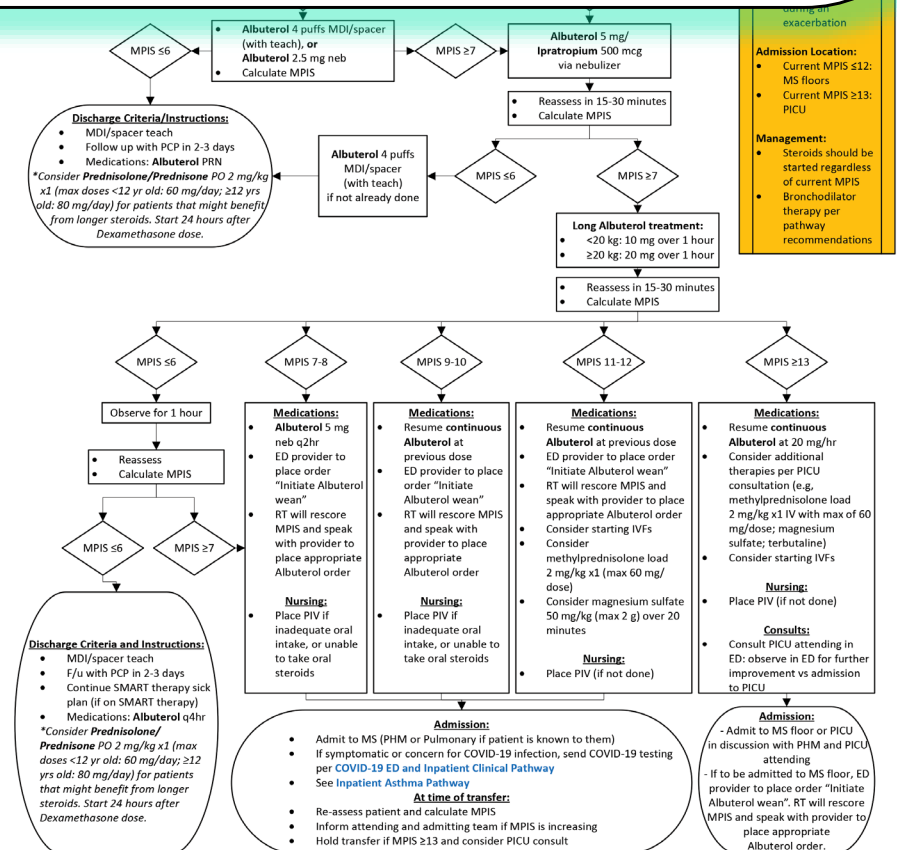
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Inclusion Criteria: ≥ 1 years old; previous diagnosis of asthma or ≥ 2 previous episodes of wheezing; MPIS ≥ 5 ; patients who were given epinephrine in the ambulance or at an outlying hospital; patients with history of prior ICU admissions who present 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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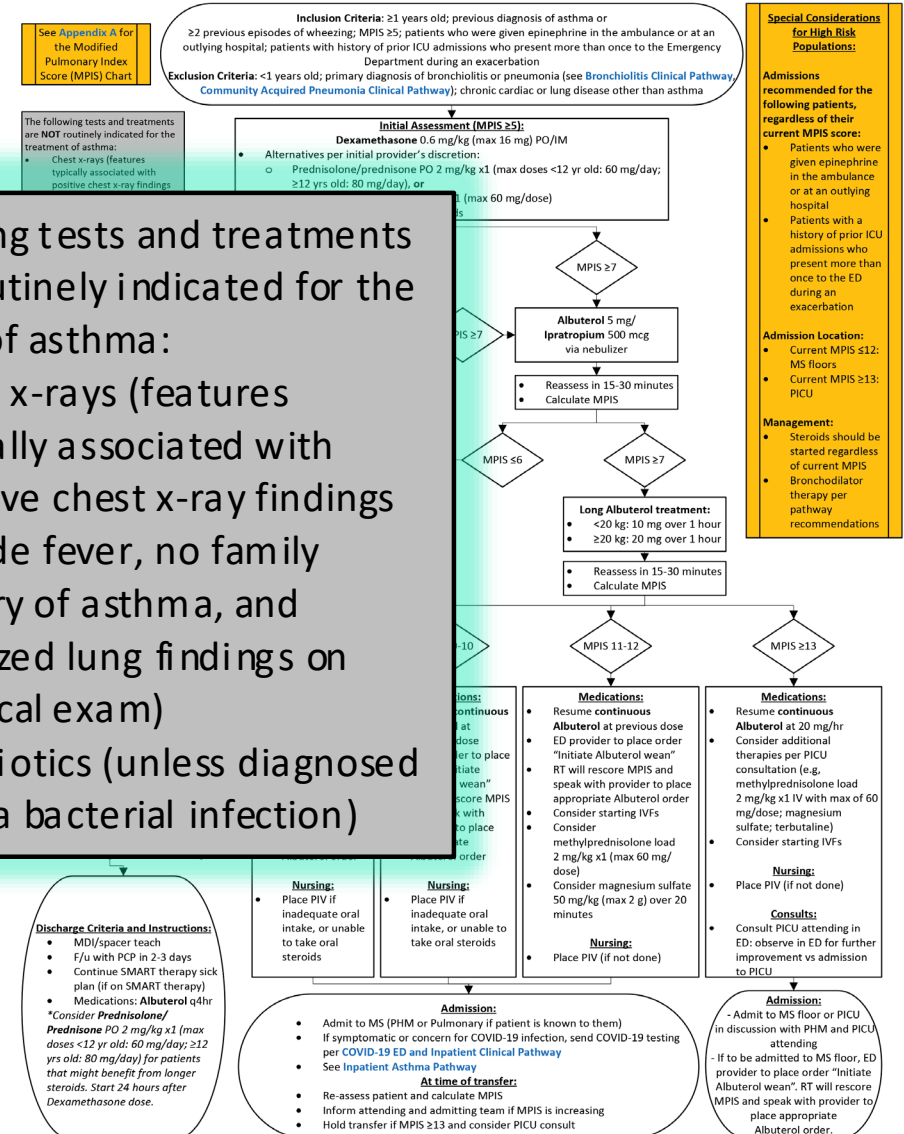
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The following tests and treatments are NOT routinely indicated for the treatment of asthma:

- Chest X-Rays⁷
- Antibiotics (unless diagnosed with a bacterial infection)^{7,8,9}

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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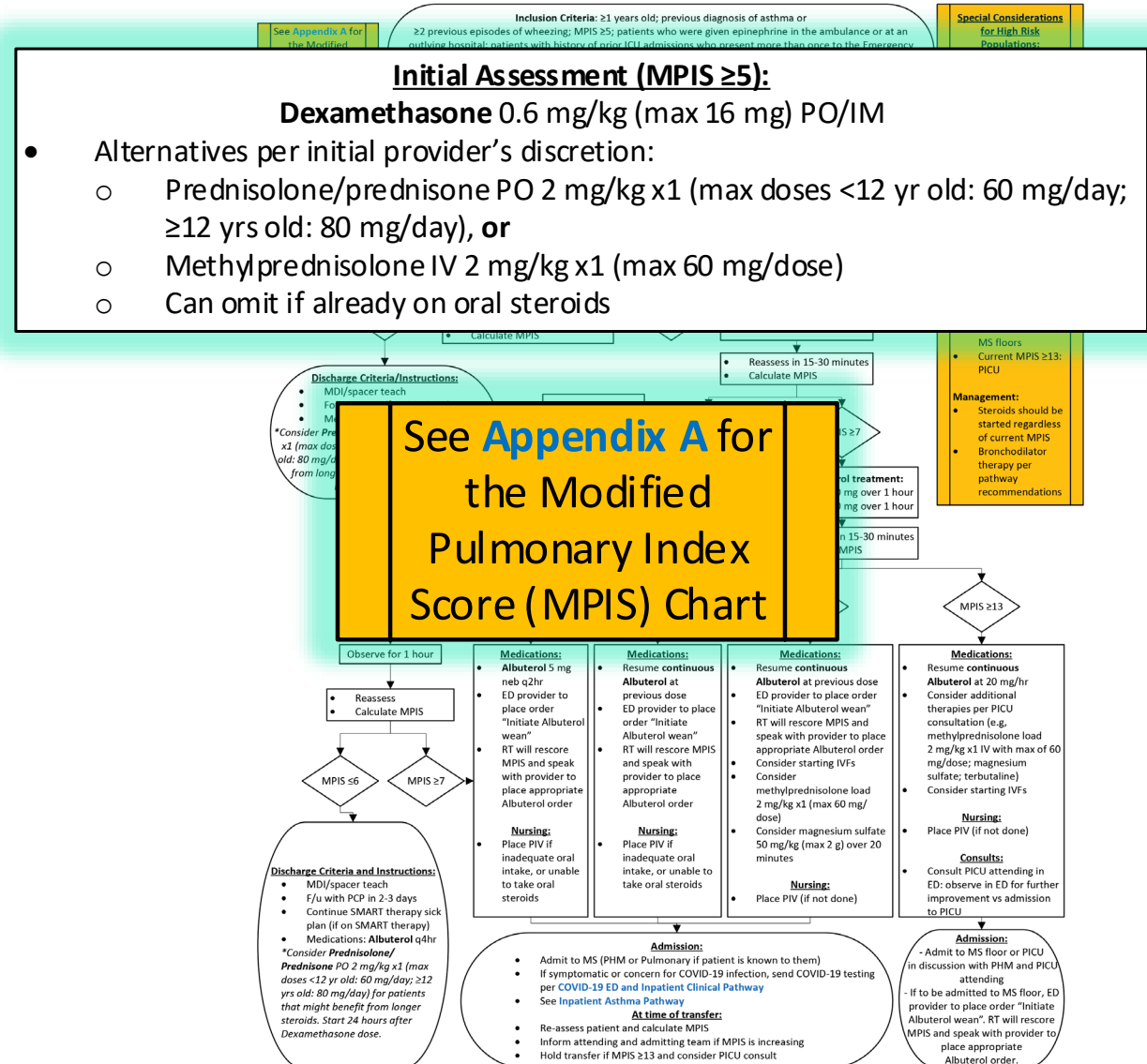
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- Every patient in the ED should receive systemic steroids, either PO or IM (if not tolerating PO) within 1 hour of presentation
 - Dexamethasone may be preferable because it is a single dose that lasts 24 hours. This may be helpful for medication 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 improvement⁷
 - Administration can be held if the patient is already on oral steroids.
- After steroid administration, the pathway divides based on MPIS score.

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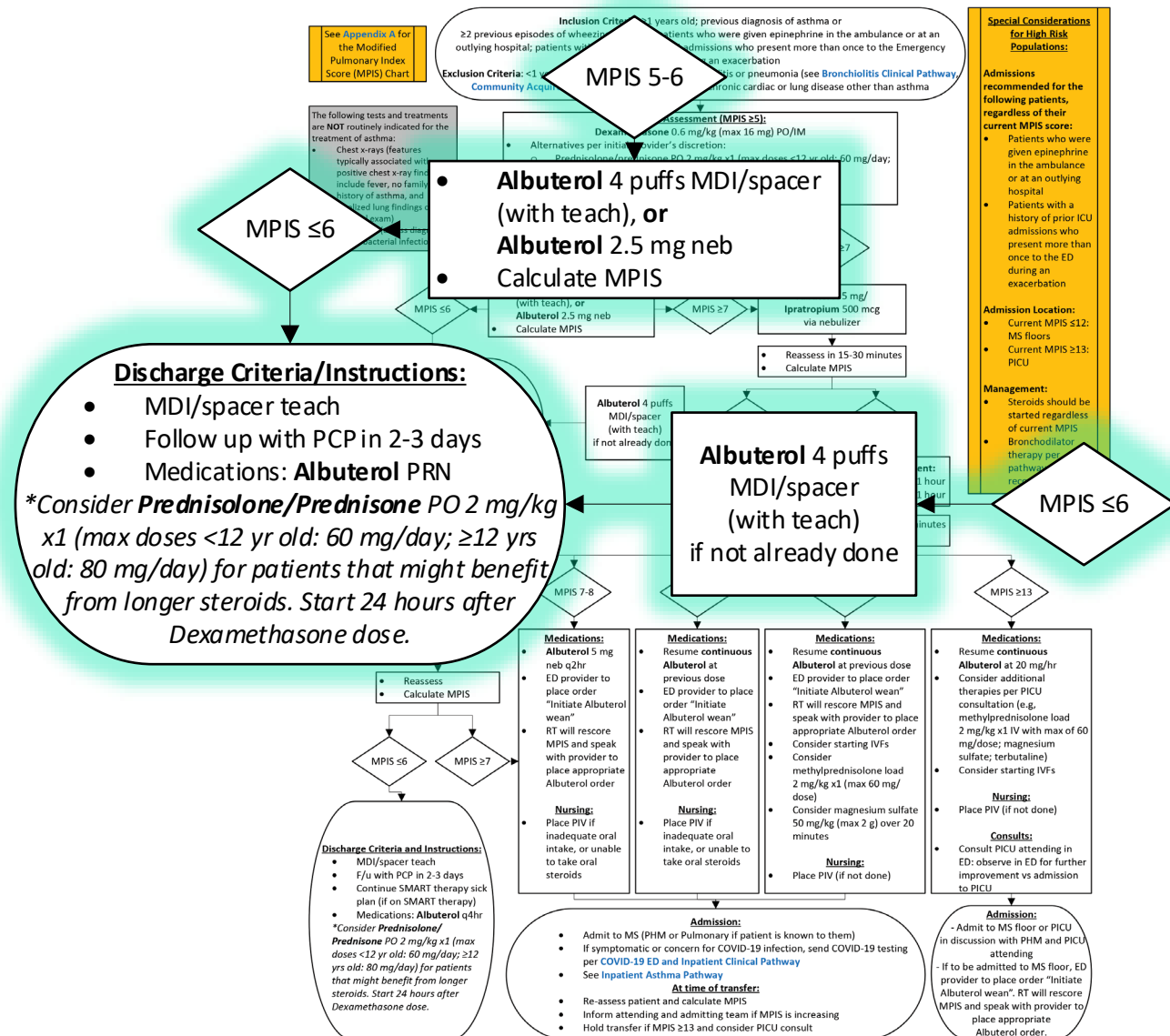
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- For those with initial MPIS scores of 5-6, give albuterol (4 puffs or 2.5 mg neb)
- If MPIS continues to be ≤ 6 after administration of Albuterol, patients may be discharged from the ED with follow up arranged
- Dosing for prednisolone/prednisone 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.

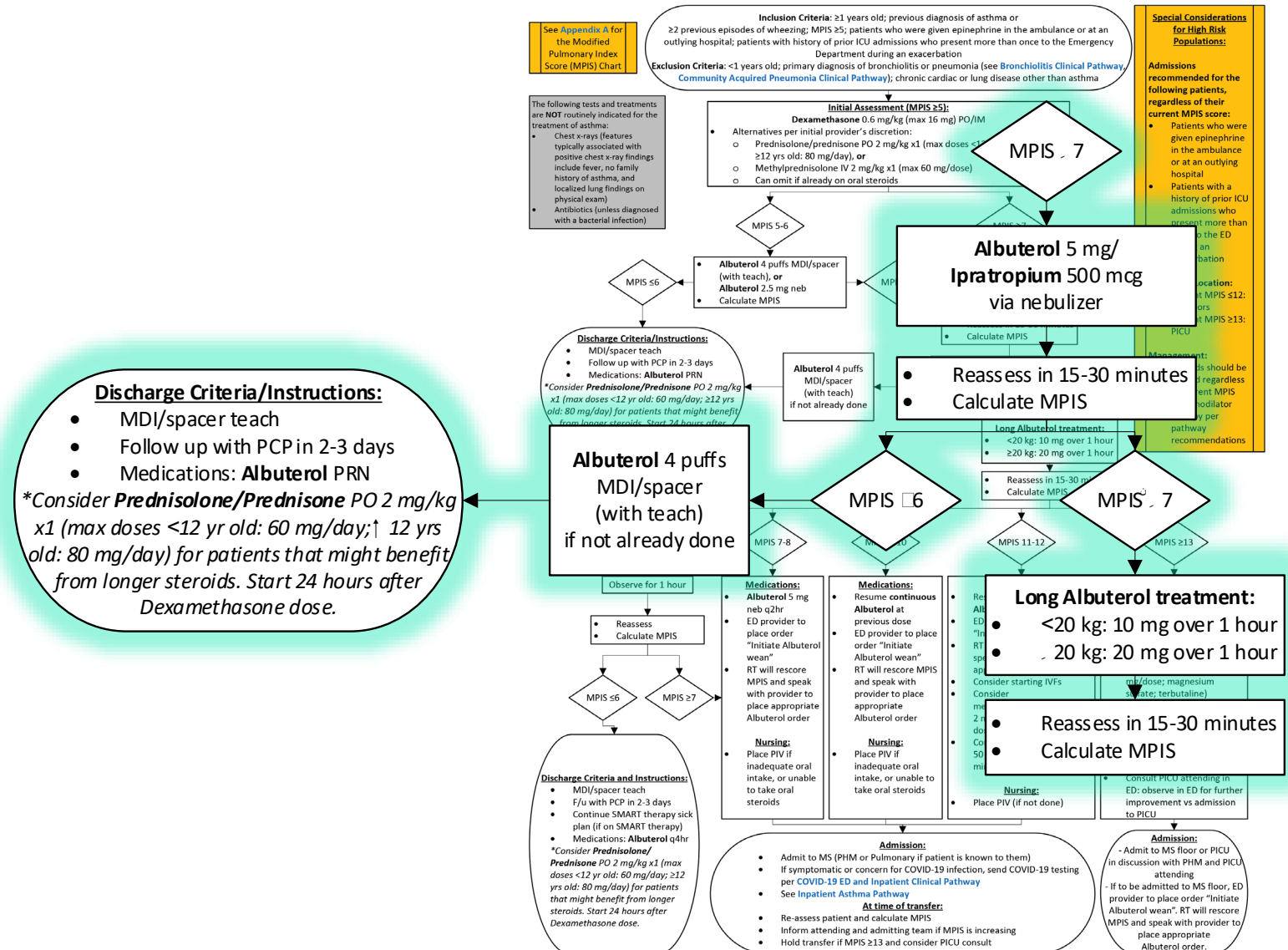


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MPIS ≥7:

- 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



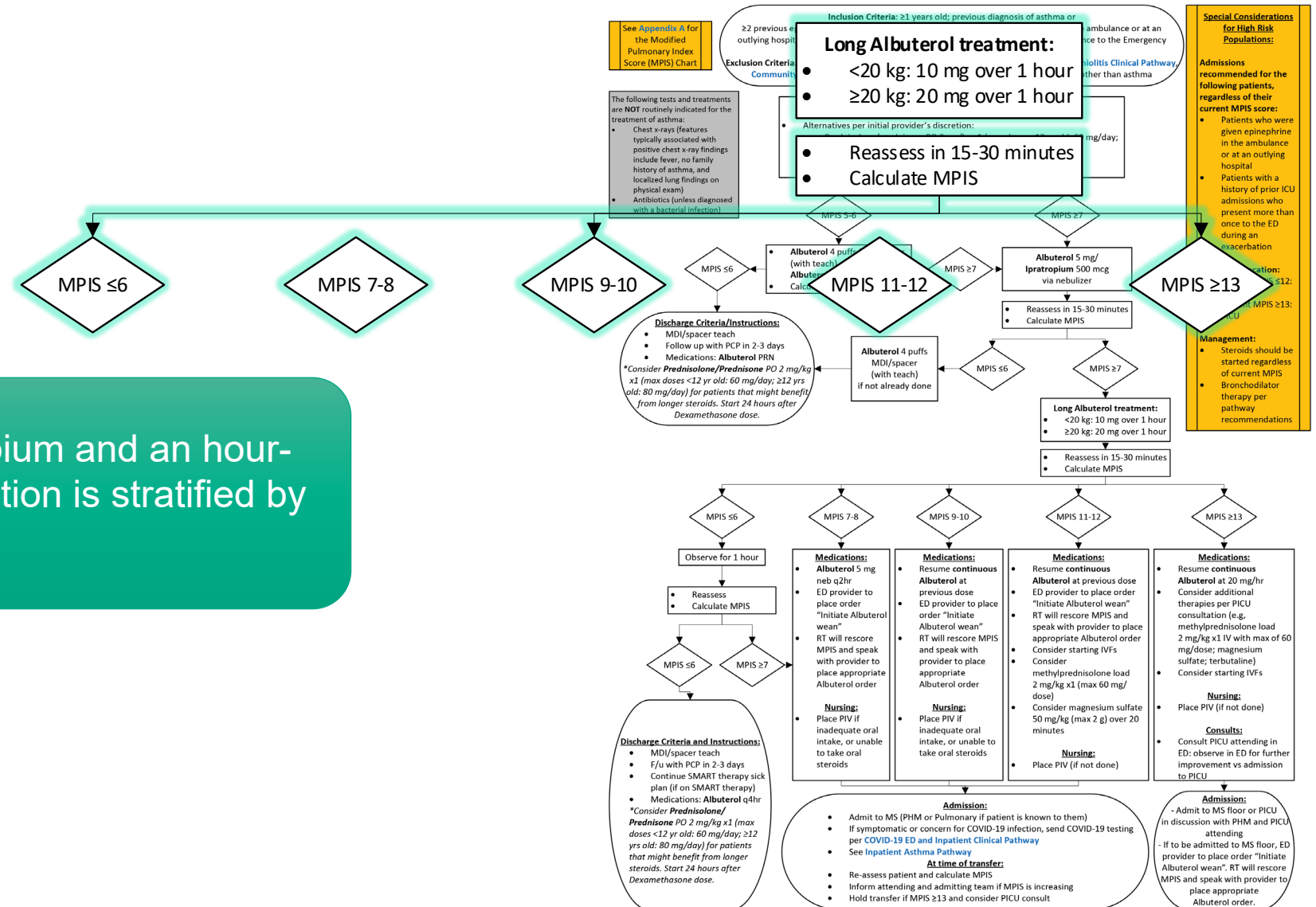
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After receiving Albuterol/Ipratropium and an hour-long Albuterol treatment, disposition is stratified by MPIS .

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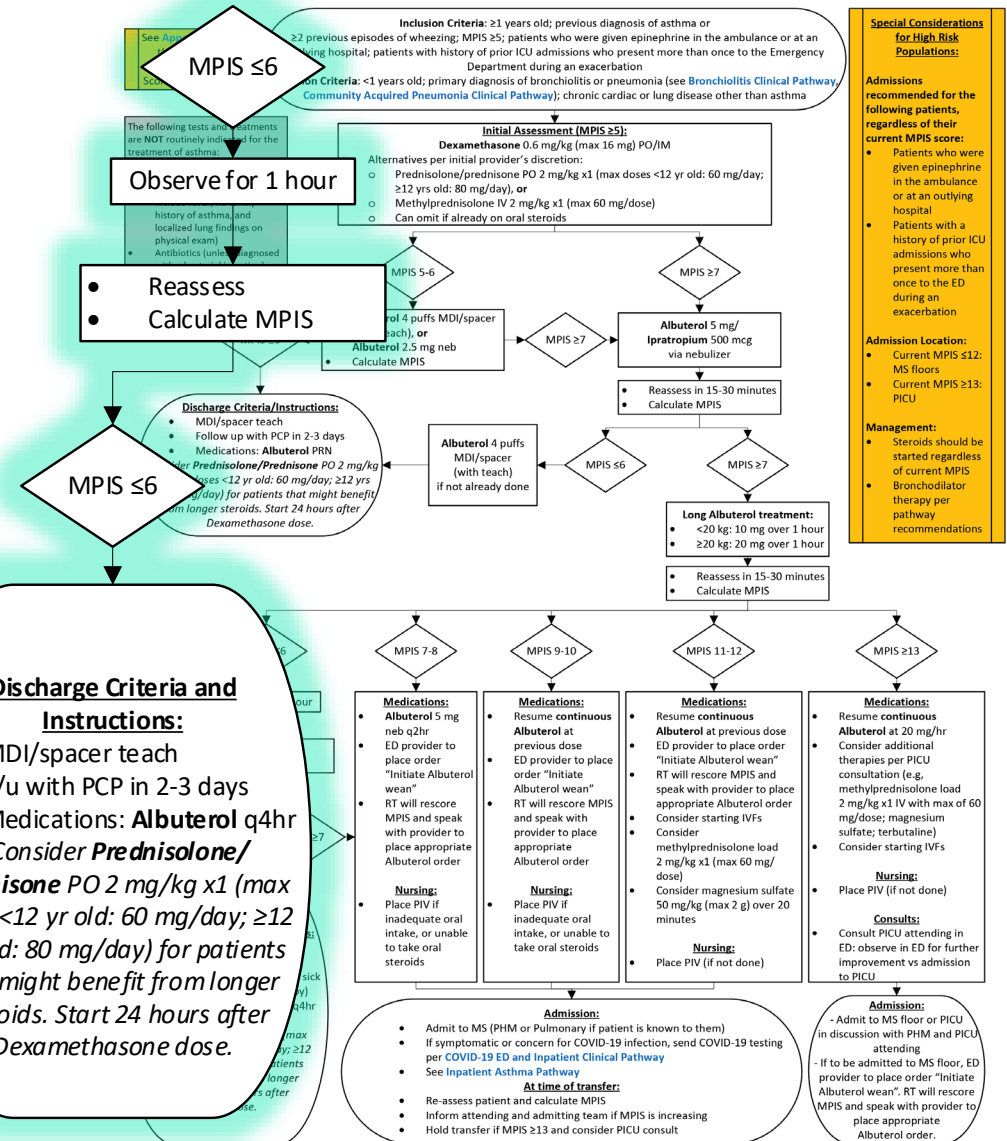
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MPIS ≤6:

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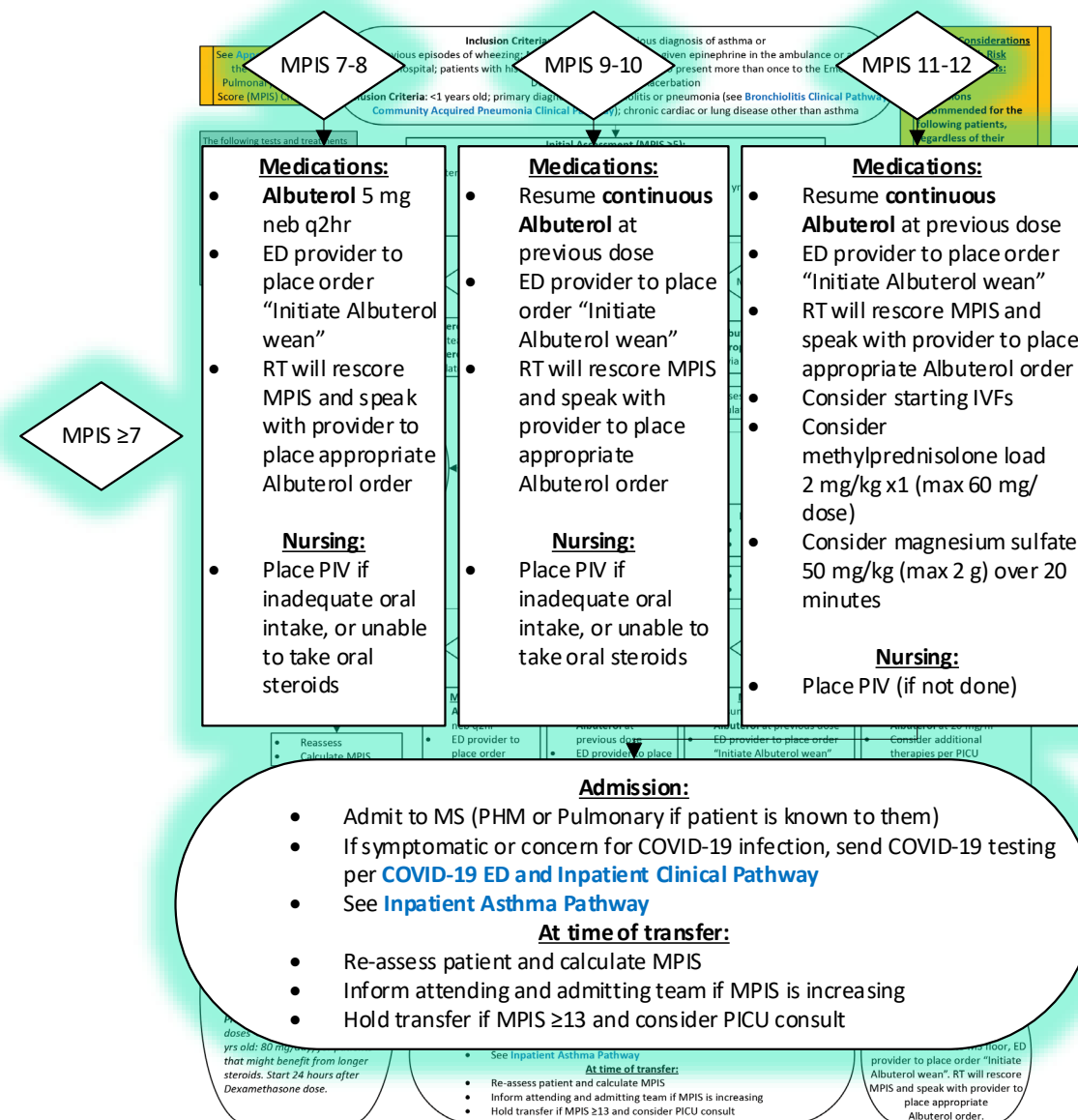
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- MPIS 7-12: will require admission to MS Unit, to either PHM or Pulmonary
 - **MPIS 7-8:**
 - Intermittent Albuterol q2h for transfer, consider PIV
 - **MPIS 9-10:**
 - Continuous Albuterol for transfer, consider PIV
 - **MPIS 11-12:**
 - Continuous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

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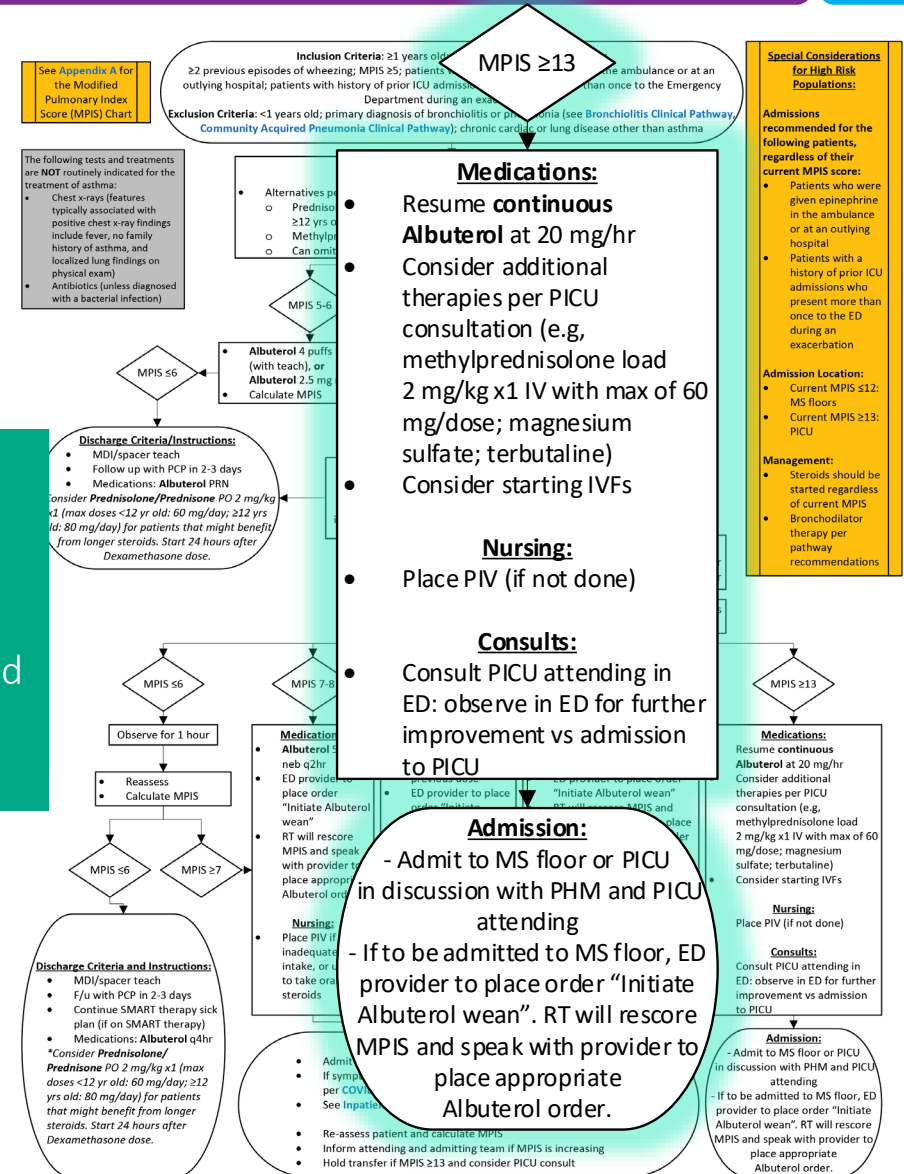
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MPIS ≥ 13 :

- 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 PICU⁶



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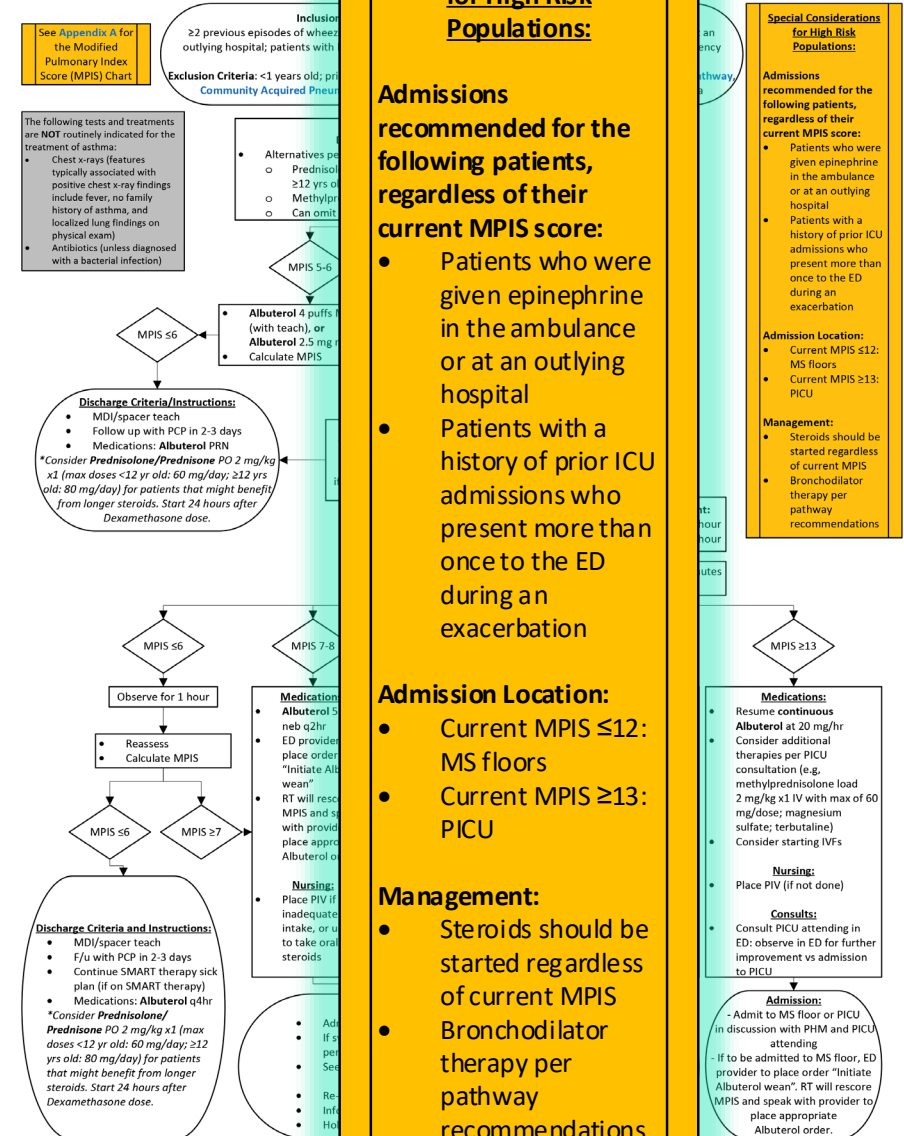
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High Risk Populations:

- 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.

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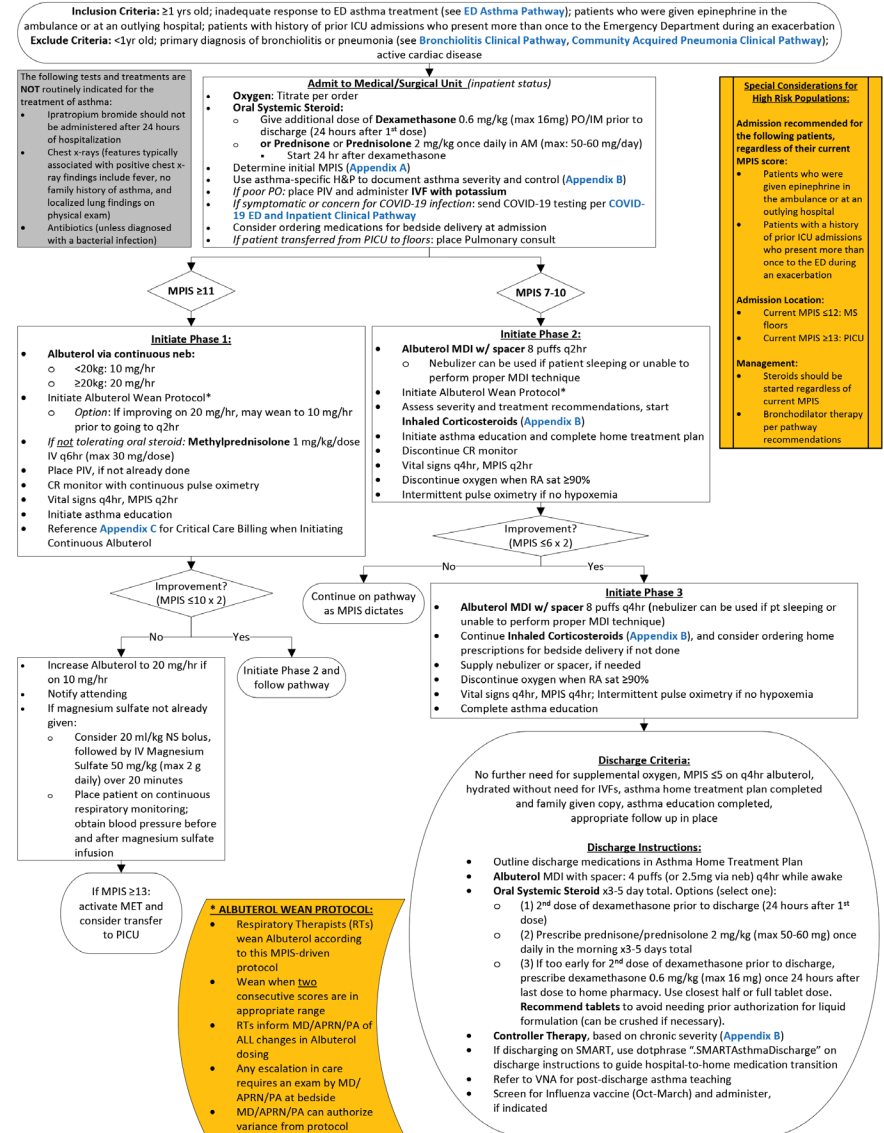
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CLINICAL PATHWAY: Inpatient Asthma

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This is the Inpatient Asthma Clinical Pathway.
We will be reviewing each component in the
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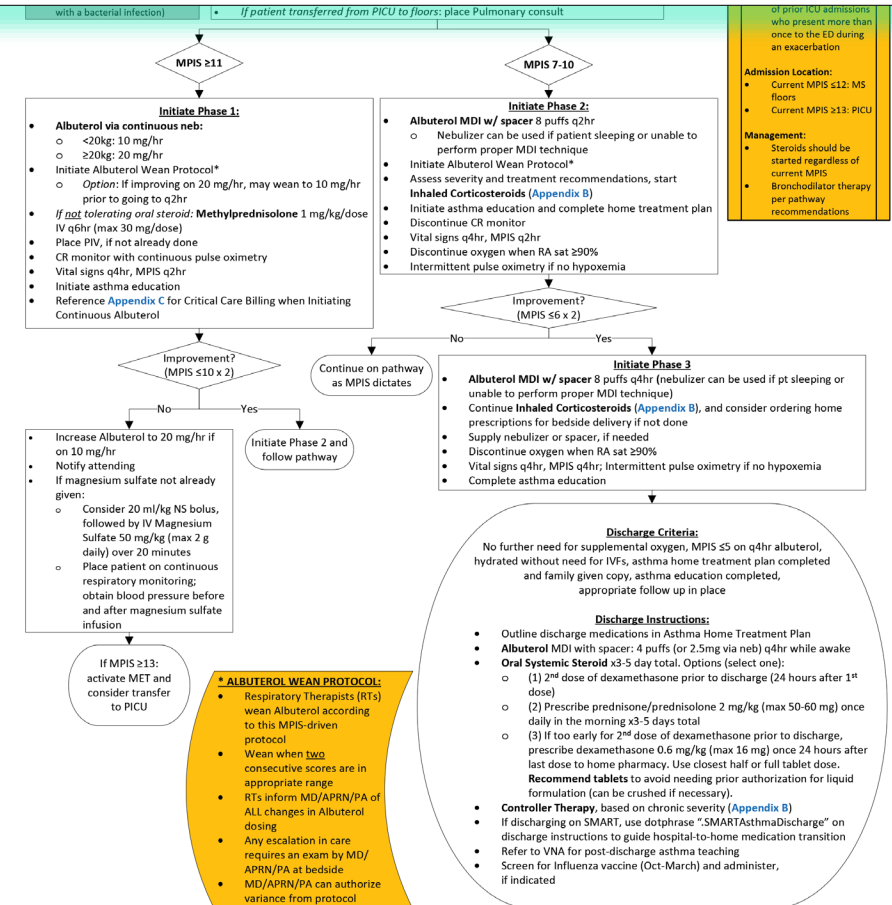
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Inclusion Criteria: ≥1 yrs old; inadequate response to ED asthma treatment (see [ED Asthma Pathway](#)); patients who were given epinephrine in the ambulance or at an outlying hospital; patients with history of prior ICU admissions who present more 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

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- Patients who have a primary diagnosis other than asthma (such as bronchiolitis 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-Rays⁷
- Antibiotics (unless diagnosed with a bacterial infection)^{7,8,9}

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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-Rays⁷ • Antibiotics (unless diagnosed with a bacterial infection)^{7,8,9}	Admit to Medical/Surgical Unit (inpatient status) • Oxygen: Titrate per order • Oral Systemic Steroids	Special Considerations for High Risk Populations:
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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
- 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)

Albuterol • Initial • If not • IV q6 • Place • CR m • Vital • Initial • Refer • Cont	Discharge • Any escalation in care requires an exam by MD/ APRN/PA at bedside • MD/APRN/PA can authorize variance from protocol	Discharge • If discharging on SMART, use dotphrase "SMART Asthma Discharge" on discharge instructions to guide hospital-to-home medication transition • Refer to VNA for post-discharge asthma teaching • Screen for Influenza vaccine (Oct-March) and administer, if indicated
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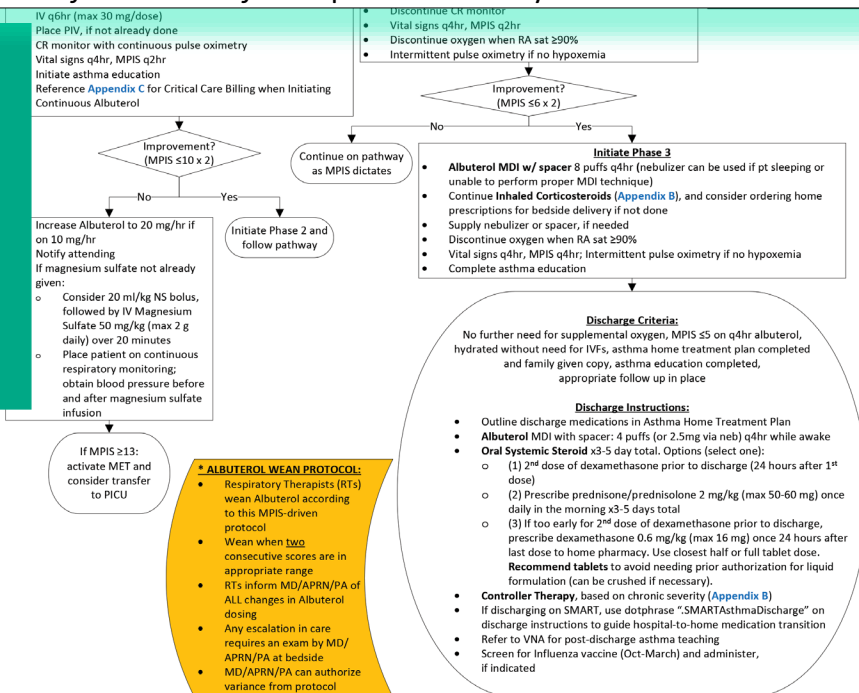
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- All inpatients will require additional dosing of systemic steroids. There are 2 options, including prednisolone/prednisone or dexamethasone
 - Dexamethasone 24 hrs after 1st dose
 - Prednisone/Prednisolone 2 mg/kg/dose DAILY
- Consult Pulmonary team if transferred from PICU to PHM

Daily systemic steroid non-inferior to BID dosing and more physiologic (GINA 2025)

Admit to Medical/Surgical Unit (inpatient status)

- **Oxygen:** Titrate per order
- **Oral Systemic Steroid:**
 - Give additional dose of **Dexamethasone** 0.6 mg/kg (max 16mg) PO/IM prior to discharge (24 hours after 1st dose)
 - **or Prednisone or Prednisolone** 2 mg/kg once daily in AM (max: 50-60 mg/day)
 - Start 24 hr after dexamethasone
- Determine initial MPIS (**Appendix A**)
- Use asthma-specific H&P to document asthma severity and control (**Appendix B**)
- *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
- *If patient transferred from PICU to floors:* place Pulmonary consult



*** ALBUTEROL WEAN PROTOCOL:**

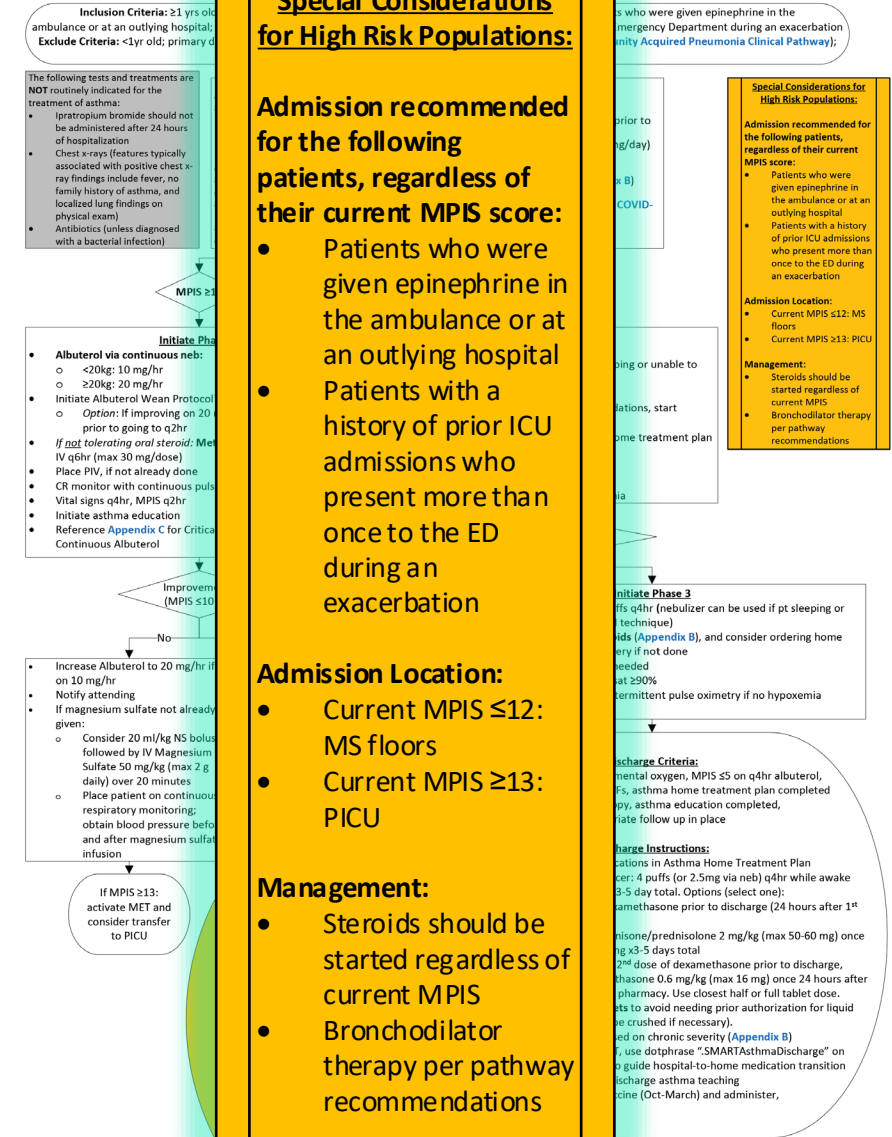
- Respiratory Therapists (RTs) wean Albuterol according to this MPIS-driven protocol
- Wean when two consecutive scores are in appropriate range
- RTs inform MD/APRN/PA of ALL changes in Albuterol dosing
- Any escalation in care requires an exam by MD/APRN/PA at bedside
- MD/APRN/PA can authorize variance from protocol

NEXT PAGE

- 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.

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- Use the Asthma-Specific H&P to document asthma severity and control
 - See how to locate the H&P template on next slide
 - See Appendix A on the slide following this
- Consider ordering medications for bedside delivery on admission

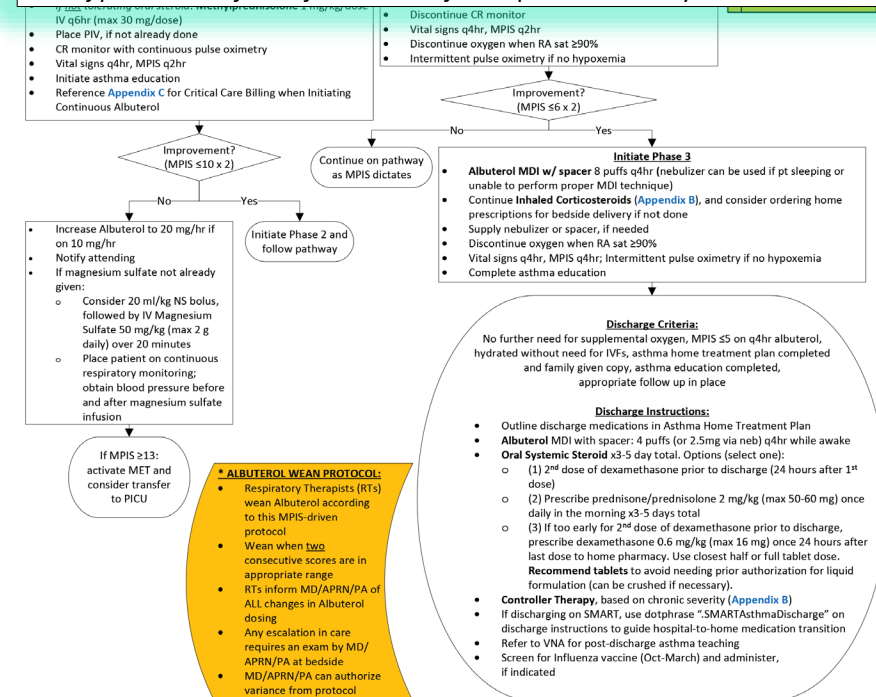
Using EMR reminders of control questions can improve accuracy of asthma severity and control assessment¹²

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

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
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Asthma-Specific H&P

Admission.

OVERVIEW

Patient Overview
ED Overview
Care Teams
Care Everywhere
Ord Rec Status

DOCUMENTATION

Problem List
Allergies
Dosing Weight
History
Active Infection
BestPractice
Expected Discharge
Admission H&P
IPass Report

ORDERS

Outside Meds
Ord Rec-Sign
Cosign Orders

BILLING PROVIDER CHARGES

Billing Provider Cha

✓ Mark as Reviewed

Last Reviewed by Lauren Boudreau, DO on 7/20/2019 at 5:16 PM

Active Infection

Infection Control

BestPractice Advisories

No advisories to address.

Expected Discharge

Expected discharge date and time not yet set for this stay.

Admission H&P

+ Create Note in NoteWriter



+ Create Note

1 Asthma

See All Notes

Refresh

HISTORY OF PRESENT ILLNESS

Current Impairment

Patient reports

- Daytime symptoms {Day Symptoms:21825}
- Night-time awakening {Nighttime Symptoms:21825} < or = 2 days per week (intermittent)
- Limitation with normal activity {Limitations:21825} > 2 days per week but not daily (mild persistent)
- Albuterol use {Agonist Use:21828} daily (moderate persistent)
- Asthma triggers {Triggers:21839} 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:

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

Appendix B: 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
- Determine asthma control based on standardized questions (which should be documented in the Asthma-Specific H&P)
 - Classify asthma severity
 - Determine appropriate treatment
 - If insurance requires a different inhaled steroid, there is now a conversion chart to help determine equivalent dosing
 - Consult Pulmonary as needed

CLINICAL PATHWAY: Inpatient Asthma Appendix B: Assessing Asthma Severity and Treatment Recommendations

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	Symptom frequency	≤ 2 days/week	> 2 days/week but NOT daily	Daily	Throughout the day
	Night time awakenings	≤ 2x/month	≤ 3-4x/month	>1x/week	Every night
Albuterol for symptom control	≤ 2 days/week	>2 days/week	Daily	Several times per day	
Interfere with normal activity	None	Minor limitation	Some limitation	Extremely limited	
Exacerbations requiring systemic steroids	0-1/year	≥2/year with more frequent or intense events = greater severity			

Step 1:
Assess and DOCUMENT asthma control for 2 weeks prior to exacerbation

Determine severity if new diagnosis of asthma

If currently on medication & well controlled, continue current treatment

If on meds, taking appropriately? → YES → Increase Step by 1 UNLESS well controlled (all green answers above)

*Taking Controller Medications Appropriately:

- Taking medications as prescribed ≥80% of the time (self report, pharmacy refills)
- Using correct technique (using a spacer correctly)

Step 2:
Classify asthma severity

Worst symptom documented above determines severity

	Intermittent	Mild Persistent	Moderate Persistent	Severe Persistent
<4 years old	STEP 1 Reliever only. Albuterol (90 mcg/act) 4 puffs q4hr PRN	STEP 2 Fluticasone (44 mcg/act) 2 puffs BID + Albuterol (90 mcg/act) 4 puffs q4hr PRN	STEP 3 Fluticasone (110 mcg/act) 2 puffs BID + Albuterol (90 mcg/act) 4 puffs q4hr PRN	STEP 4 Consult Pulmonary
4-11 years old	STEP 1 Reliever only. Albuterol (90 mcg/act) 4 puffs q4hr PRN	STEP 2 Fluticasone (44 mcg/act) 2 puffs BID + Albuterol (90 mcg/act) 4 puffs q4hr PRN	STEP 3 Budesonide/Formoterol (80/4.5) 1 puff daily, and 1 puff PRN q5 minutes; max 8 puffs/day	STEP 4 Consult pulmonary
12+ years old	STEP 1 Reliever only. Budesonide/formoterol (160/4.5) 1 puff PRN q5 minutes; max 12 puffs/day	STEP 2 Budesonide/formoterol (160/4.5) 1 puff PRN q5 minutes; max 12 puffs/day	STEP 3 Budesonide/Formoterol (160/4.5) 2 puffs daily, and 1 puff PRN q5 minutes; max 12 puffs/day	STEP 4 Consult pulmonary

For patients newly starting SMART, please prescribe 2 inhalers for adequate medication supply for maintenance and reliever treatment.

Step 4:
Consult

Consult Pulmonology if patient requires Step 5 treatment, or as needed

Conversion Chart
If insurance does not cover the recommended medication, see equivalent doses of inhaled steroids

	Fluticasone (Flovent) inhaler	Budesonide (Pulmicort) nebulizer	Budesonide/Formoterol (Symbicort) inhaler
Low dose 0-4 years	176 mcg	0.25-0.5 mg	
Low dose 5-11 years	88 mcg – 176 mcg		160 mcg – 320 mcg
Low dose 12+ years	88 mcg – 264 mcg		320 mcg
Medium dose 0-4 years	176 mcg – 352 mcg	1 mg	
Medium dose 5-11 years	176 mcg – 352 mcg		320 mcg – 640 mcg
Medium dose 12+ years	264 mcg – 440 mcg		640 mcg
High dose 0-4 years	>352 mcg	2 mg	
High dose 5-11 years	>352 mcg		
High dose 12+ years	>440 mcg		

SMART Medication Dosing Conversion for Insurance Coverage

Budesonide/Formoterol (Symbicort)	Mometasone/Formoterol (Dulera)
80/4.5 mcg	100/5 mcg
160/4.5 mcg	200/5 mcg

Beclomethasone dipropionate (Qvar) no longer recommended



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MPIS ≥ 11

Initiate Phase 1:

- **Albuterol via continuous neb:**
 - <20kg: 10 mg/hr
 - ≥ 20 kg: 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
- Reference **Appendix C** for Critical Care Billing when Initiating Continuous Albuterol

Care is stratified across MPIS scores

- **Phase 1:** Continuous Albuterol
- **Phase 2:** Intermittent Albuterol q2h
- **Phase 3:** Intermittent Albuterol q4h

CLINICAL PATHWAY: Inpatient Asthma

THIS PATHWAY
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JUDGMENT.

MPIS 7-10

Initiate Phase 2:

- **Albuterol MDI w/ spacer** 8 puffs q2hr
 - Nebulizer can be used if patient sleeping or unable to perform proper MDI technique
- Initiate Albuterol Wean Protocol*
- Assess severity and treatment recommendations, start **Inhaled Corticosteroids (Appendix B)**
- Initiate asthma education and complete home treatment plan
- Discontinue CR monitor
- Vital signs q4hr, MPIS q2hr
- Discontinue oxygen when RA sat $\geq 90\%$
- Intermittent pulse oximetry if no hypoxemia

Improvement?
(MPIS $\leq 6 \times 2$)

Improvement?
(MPIS $\leq 10 \times 2$)

Improvement?
(MPIS $\leq 6 \times 2$)

Improvement?
(MPIS $\leq 10 \times 2$)

Initiate Phase 3

- **Albuterol MDI w/ spacer** 8 puffs q4hr (nebulizer can be used if pt sleeping or unable to perform proper MDI technique)
- Continue **Inhaled Corticosteroids (Appendix B)**, and consider ordering home prescriptions for bedside delivery if not done
- Supply nebulizer or spacer, if needed
- Discontinue oxygen when RA sat $\geq 90\%$
- Vital signs q4hr, MPIS q4hr; Intermittent pulse oximetry if no hypoxemia
- Complete asthma education

Special Considerations for High Risk Populations:

Admission recommended for the following patients, regardless of their current MPIS score:

- Patients who were given epinephrine in the ambulance or at an outlying hospital
- Patients with a history of prior ICU admissions who present more than once to the ED during an exacerbation

Admission Location:

- Current MPIS ≤ 12 : MS floors
- Current MPIS ≥ 13 : PICU

Management:

- Steroids should be started regardless of current MPIS
- Bronchodilator therapy per pathway recommendations

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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

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

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
- Chest x-rays (features typically associated with positive chest x-ray findings)
- family history of localized physical
- Antibiotics
- with a

Admit to Medical/Surgical Unit (inpatient status)

- **Oxygen:** Titrate per order
- **Oral Systemic Steroid:**
 - Give additional dose of **Dexamethasone** 0.6 mg/kg (max 16mg) PO/IM prior to discharge (24 hours after 1st dose)
 - or **Prednisone** or **Prednisolone** 2 mg/kg once daily in AM (max: 50-60 mg/day)
 - Start 24 hr after dexamethasone

Special Considerations for High Risk Populations:

Admission recommended for the following patients, regardless of their current MPIS score:

- Patients who were given epinephrine in the ambulance or at an outlying hospital
- Patients with a history of prior ICU admissions who present more than once to the ED during an exacerbation

Admission Location:

- Current MPIS ≤12: MS floors
- Current MPIS ≥13: PICU

Management:

- Steroids should be started regardless of current MPIS
- Bronchodilator therapy per pathway recommendations

* **ALBUTEROL WEAN PROTOCOL:**

- Respiratory Therapists (RTs) wean Albuterol according to this MPIS-driven protocol
- Wean when two consecutive scores are in appropriate range
- RTs inform MD/APRN/PA of ALL changes in Albuterol dosing
- Any escalation in care requires an exam by MD/APRN/PA at bedside
- MD/APRN/PA can authorize variance from protocol

to this MPIS-driven protocol

- Wean when two consecutive scores are in appropriate range
- RTs inform MD/APRN/PA of ALL changes in Albuterol dosing
- Any escalation in care requires an exam by MD/APRN/PA at bedside
- MD/APRN/PA can authorize variance from protocol

daily in the morning x3-5 days total

- (3) If too early for 2nd dose of dexamethasone prior to discharge, prescribe dexamethasone 0.6 mg/kg (max 16 mg) once 24 hours after last dose to home pharmacy. Use closest half or full tablet dose. **Recommend tablets** to avoid needing prior authorization for liquid formulation (can be crushed if necessary).
- **Controller Therapy**, based on chronic severity ([Appendix B](#))
- If discharging on SMART, use dotphrase "SMARTAsthmaDischarge" on discharge instructions to guide hospital-to-home medication transition
- Refer to VNA for post-discharge asthma teaching
- Screen for Influenza vaccine (Oct-March) and administer, if indicated

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If MPIS ≥ 11 , Initiate Phase 1

- Patients requiring continuous albuterol should have an IV placed
- If not tolerating oral steroid, give **Methylprednisolone IV**
- CR monitor w/continuous pulse oximetry
- Vital signs $\geq$ q4hr, MPIS q2h
- Initiate Asthma Education

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: < 1 yr old; primary diagnosis of bronchiolitis or pneumonia (see [Bronchiolitis Clinical Pathway](#), [Community Acquired Pneumonia Clinical Pathway](#)); active cardiac disease

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
- 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)

Admit to Medical/Surgical Unit (inpatient status)

- **Oxygen:** Titrate per order
- **Oral Systemic Steroid:**
 - Give additional dose of Dexamethasone 0.6 mg/kg (max 16mg) PO/IM prior to discharge (24 hours after 1st dose)
 - **or Prednisone or Prednisolone 2 mg/kg once daily in AM (max: 50-60 mg/day)**
 - Start 24 hr after admission
- Determine initial severity and control ([Appendix B](#))
- Use asthma severity and control to guide treatment
- If patient transferred from another floor: place Pulmonary consult

Special Considerations for High Risk Populations:

Admission recommended for the following patients, regardless of their current MPIS score:

- Patients who were given epinephrine in the ambulance or at an outlying hospital
- Patients with a history of prior ICU admissions who present more than once to the ED during an exacerbation

MPIS ≥ 11

Initiate Phase 1:

- **Albuterol via continuous neb:**
 - < 20 kg: 10 mg/hr
 - ≥ 20 kg: 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 q2h
- Initiate asthma education
- Reference [Appendix C](#) for Critical Care Billing when Initiating Continuous Albuterol

activate MET and consider transfer to PICU

*** ALBUTEROL WEAN PROTOCOL:**

- Respiratory Therapists (RTs) wean Albuterol according to this MPIS-driven protocol
- Wean when two consecutive scores are in appropriate range
- RTs inform MD/APRN/PA of ALL changes in Albuterol dosing
- Any escalation in care requires an exam by MD/APRN/PA at bedside
- MD/APRN/PA can authorize variance from protocol

- (1) 2nd dose of dexamethasone prior to discharge (24 hours after 1st dose)
- (2) Prescribe prednisone/prednisolone 2 mg/kg (max 50-60 mg) once daily in the morning x3-5 days total
- (3) If too early for 2nd dose of dexamethasone prior to discharge, prescribe dexamethasone 0.6 mg/kg (max 16 mg) once 24 hours after last dose to home pharmacy. Use closest half or full tablet dose. **Recommend tablets** to avoid needing prior authorization for liquid formulation (can be crushed if necessary).
- **Controller Therapy**, based on chronic severity ([Appendix B](#))
- If discharging on SMART, use dotphrase "SMARTAsthmaDischarge" on discharge instructions to guide hospital-to-home medication transition
- Refer to VNA for post-discharge asthma teaching
- Screen for Influenza vaccine (Oct-March) and administer, if indicated

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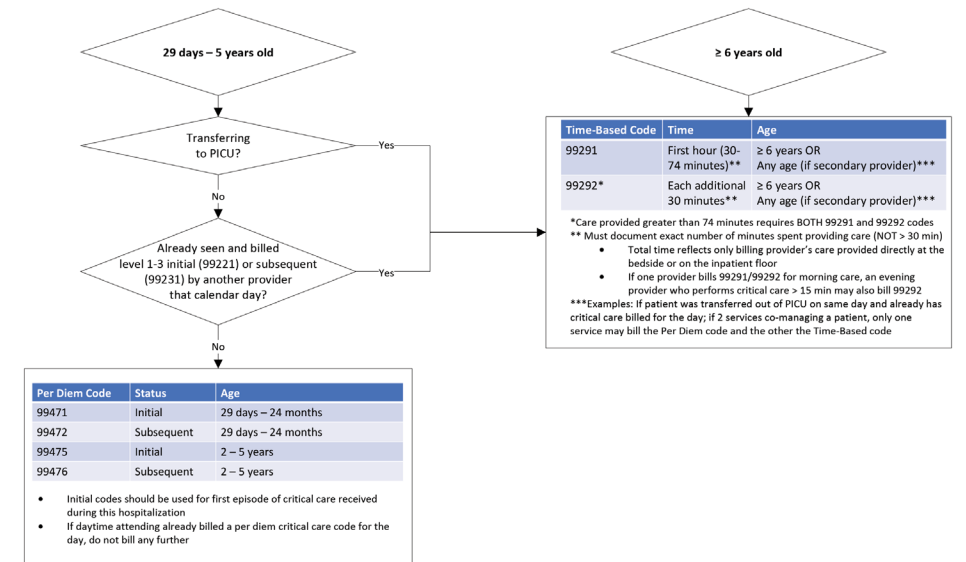
Appendix C addresses critical care billing and asthma documentation tips

- Patients receiving continuous albuterol should be billed as critical care
- This appendix specifically addresses what is important to document for all asthma admission as well as specific documentation required for critical care billing

CLINICAL PATHWAY: Inpatient Asthma Appendix C: Asthma Documentation and Billing

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CRITICAL CARE BILLING WHEN INITIATING CONTINUOUS ALBUTEROL:



ASTHMA DOCUMENTATION TIPS:

General Tips	Critical Care Tips
• All patients on q2h or continuous albuterol treatments meets definition for status asthmaticus • If the patient has hypoxia <90% on RA, they also meet criteria for acute hypoxic respiratory failure, and this should also be documented • If the patient has a respiratory infection at time of admission, please document type of infection (organism to best of your knowledge) and its location (URI vs LRTI or PNA location) • Please reconcile the patient's asthma severity in the discharge summary, as the admit note severity is often outdated	• Note must include: ◦ That the patient was critically ill during the time the billing provider saw the patient ◦ What made the patient critically ill (i.e. "Patient requires critical care for status asthmaticus") ◦ The nature of treatment and management provided by the billing provider ◦ The time spent on the floor providing care must be specified (when billing time based codes) • Please note that documenting critical care services when seeing the patient with a resident or fellow requires more than a standard attestation ◦ Please use .Metcriticalcarebilling for the attestation



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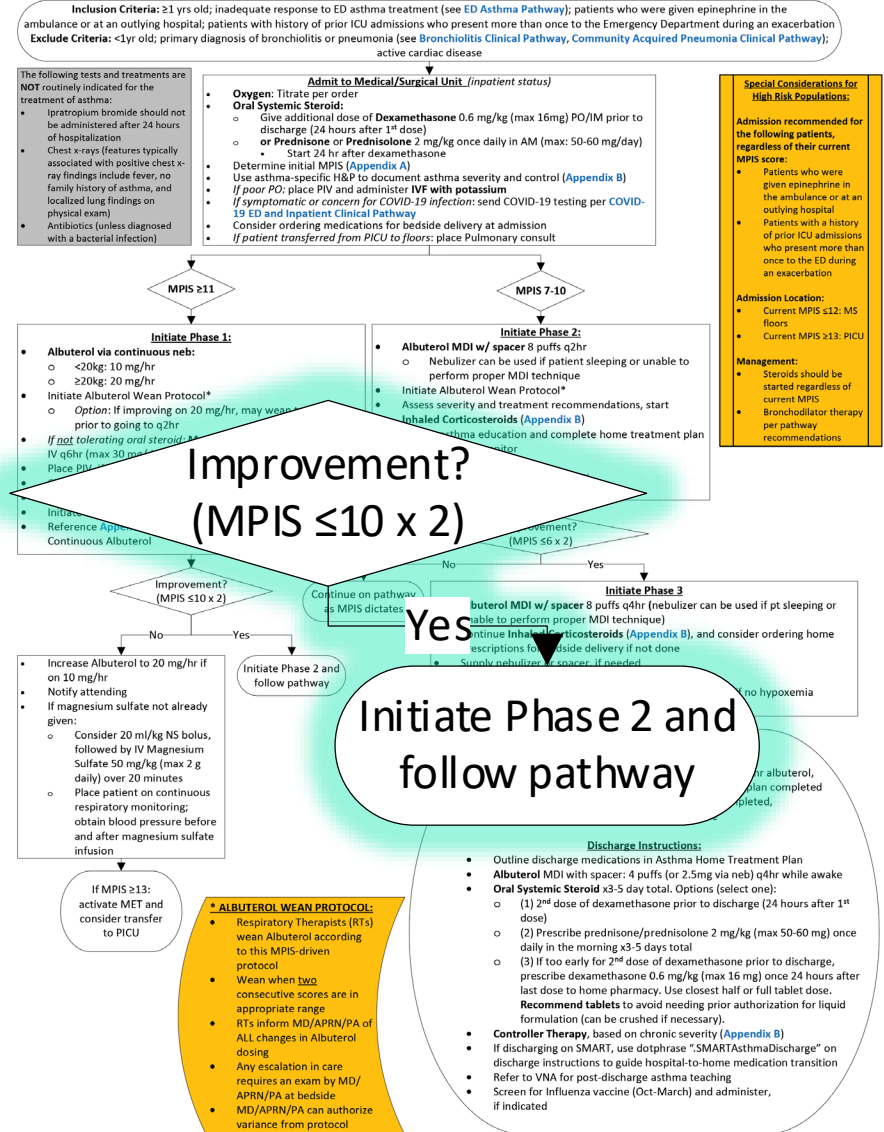
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Improvement after Phase 1 (Two consecutive scores in appropriate range)

- Initiate Phase 2 and follow pathway

CLINICAL PATHWAY: Inpatient Asthma

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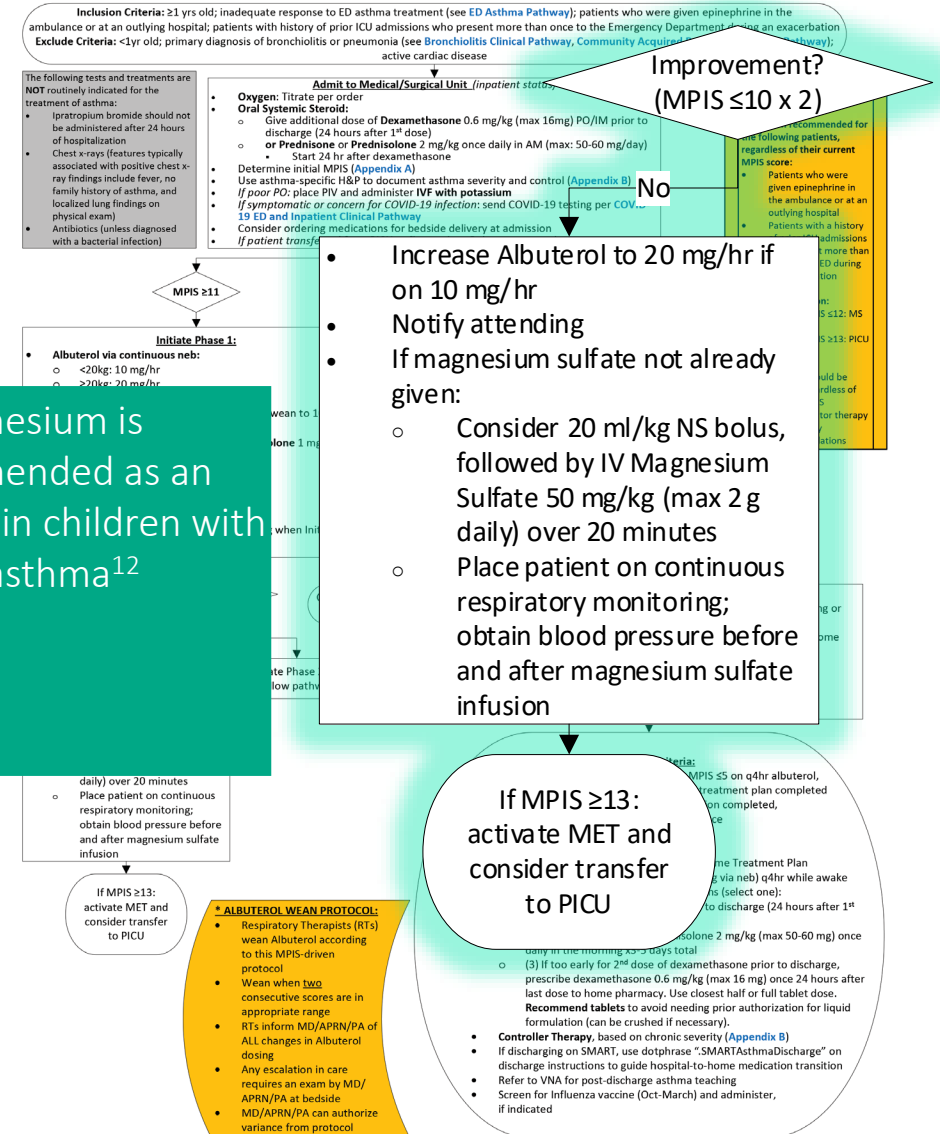
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If NO Improvement

- Increase albuterol dose
- Give Mag Sulfate (if not already given) with normal saline bolus

If NO Improvement and MPIS ≥ 13 activate MET system and consider transfer to PICU

IV Magnesium is recommended as an adjunct in children with critical asthma¹²



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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 B for guidelines for recommendations on controller therapy
- Consider ordering medications for bedside delivery
- Complete Asthma Education
- Supply nebulizer or spacer if needed

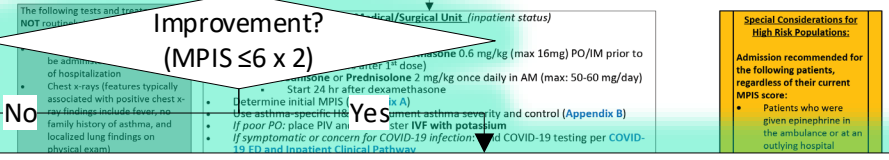
Continue on pathway as MPIS dictates

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

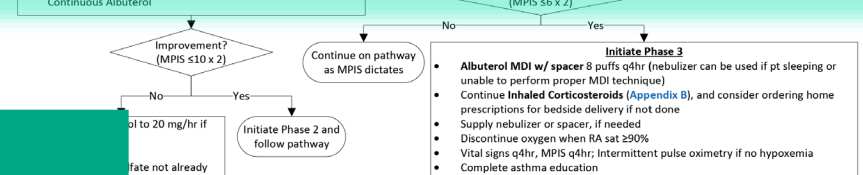
CLINICAL PATHWAY: Inpatient Asthma

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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



- Initiate Phase 3**
- **Albuterol MDI w/ spacer** 8 puffs q4hr (nebulizer can be used if pt sleeping or unable to perform proper MDI technique)
 - Continue **Inhaled Corticosteroids** ([Appendix B](#)), and consider ordering home prescriptions for bedside delivery if not done
 - Supply nebulizer or spacer, if needed
 - Discontinue oxygen when RA sat ≥90%
 - Vital signs q4hr, MPIS q4hr; Intermittent pulse oximetry if no hypoxemia
 - Complete asthma education



- Discharge Criteria:**
No further need for supplemental oxygen, MPIS ≤5 on q4hr albuterol, hydrated without need for IVs, asthma home treatment plan completed and family given copy, asthma education completed, appropriate follow up in place
- Discharge Instructions:**
- Outline discharge medications in Asthma Home Treatment Plan
 - **Albuterol MDI** with spacer: 4 puffs (or 2.5mg via neb) q4hr while awake
 - **Oral Systemic Steroid** x3-5 day total. Options (select one):
 - (1) 2nd dose of dexamethasone prior to discharge (24 hours after 1st dose)
 - (2) Prescribe prednisone/prednisolone 2 mg/kg (max 50-60 mg) once daily in the morning x3-5 days total
 - (3) If too early for 2nd dose of dexamethasone prior to discharge, prescribe dexamethasone 0.6 mg/kg (max 16 mg) once 24 hours after last dose to home pharmacy. Use closest half or full tablet dose. **Recommend tablets** to avoid needing prior authorization for liquid formulation (can be crushed if necessary).
 - **Controller Therapy**, based on chronic severity ([Appendix B](#))
 - If discharging on SMART, use dotphrase "SMARTAsthmaDischarge" on discharge instructions to guide hospital-to-home medication transition
 - Refer to VNA for post-discharge asthma teaching
 - Screen for Influenza vaccine (Oct-March) and administer, if indicated

- * ALBUTEROL WEAN PROTOCOL:**
- Respiratory Therapists (RTs) wean Albuterol according to this MPIS-driven protocol
 - Wean when two consecutive scores are in appropriate range
 - RTs inform MD/APRN/PA of ALL changes in Albuterol dosing
 - Any escalation in care requires an exam by MD/APRN/PA at bedside
 - MD/APRN/PA can authorize variance from protocol

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- **Patients must meet all criteria prior to being discharged**
- Asthma Treatment Plan must be 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 plan⁸

Dexamethasone is not inferior to Prednisone/ Prednisolone for mild to moderate exacerbations^{10,11}

During flu season children >6 months admitted for asthma exacerbation should have their flu vaccination status documented, and should have vaccine offered⁸

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

Discharge Criteria:

No further need for supplemental oxygen, MPIS ≤5 on q4hr albuterol, hydrated without need for IVFs, asthma home treatment plan completed and family given copy, asthma education completed, appropriate follow up in place

Discharge Instructions:

- Outline discharge medications in Asthma Home Treatment Plan
- **Albuterol** MDI with spacer: 4 puffs (or 2.5mg via neb) q4hr while awake
- **Oral Systemic Steroid** x3-5 day total. Options (select one):
 - (1) 2nd dose of dexamethasone prior to discharge (24 hours after 1st dose)
 - (2) Prescribe prednisone/prednisolone 2 mg/kg (max 50-60 mg) once daily in the morning x3-5 days total
 - (3) If too early for 2nd dose of dexamethasone prior to discharge, prescribe dexamethasone 0.6 mg/kg (max 16 mg) once 24 hours after last dose to home pharmacy. Use closest half or full tablet dose. **Recommend tablets** to avoid needing prior authorization for liquid formulation (can be crushed if necessary).
- **Controller Therapy**, based on chronic severity ([Appendix B](#))
- If discharging on SMART, use dotphrase “SMARTAsthmaDischarge” on discharge instructions to guide hospital-to-home medication transition
- Refer to VNA for post-discharge asthma teaching
- Screen for Influenza vaccine (Oct-March) and administer, if indicated

consecutive scores are in appropriate range

- RTs inform MD/APRN/PA of ALL changes in Albuterol dosing
- Any escalation in care requires an exam by MD/APRN/PA at bedside
- MD/APRN/PA can authorize variance from protocol

last dose to home pharmacy; use closest half or full tablet dose. **Recommend tablets** to avoid needing prior authorization for liquid formulation (can be crushed if necessary).

- **Controller Therapy**, based on chronic severity ([Appendix B](#))
- If discharging on SMART, use dotphrase “SMARTAsthmaDischarge” on discharge instructions to guide hospital-to-home medication transition
- Refer to VNA for post-discharge asthma teaching
- Screen for Influenza vaccine (Oct-March) and administer, if indicated

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Implementing SMART Therapy 11

Appendix B also addresses treatment recommendations

1. After asthma severity is classified, can use this appendix to determine appropriate treatment
2. If insurance requires a different inhaled steroid, there is now a conversion chart to help determine equivalent dosing
3. Consult Pulmonary as needed

Step 1:
Assess and DOCUMENT
asthma control for 2
weeks prior to
exacerbation

Determine severity if
new diagnosis of asthma

Symptom frequency	≤ 2 days/week	> 2 days/week but NOT daily	Daily	Throughout the day
Night time awakenings	≤ 2x/month	≤ 3-4x/month	>1x/week	Every night
Albuterol for symptom control	≤ 2 days/week	> 2 days/week	Daily	Several times per day
Interfere with normal activity	None	Minor limitation	Some limitation	Extremely limited
Exacerbations requiring systemic steroids	0-1/year	≥ 2/year with more frequent or intense events = greater severity		

If currently on medication & well controlled, continue current treatment

If on meds, taking appropriately? → YES → Increase Step by 1 UNLESS well controlled (all green answers above)

NO

Taking Controller Medications Appropriately:

- Taking medications as prescribed ≥80% of the time (self report, pharmacy refills)
- Using correct technique (using a spacer correctly)

Step 2:
Classify asthma severity

Worst symptom documented above determines severity → Intermittent → Mild Persistent → Moderate Persistent → Severe Persistent

Step 3:
Treatment Recommendations:
(NHLBI 2007 Guideline and GINA 2026 Guideline Dosage Summary)

<4 years old	STEP 1 Reliever only. Albuterol (90 mcg/act) 4 puffs q4hr PRN	STEP 2 Fluticasone (44 mcg/act) 2 puffs BID + Albuterol (90 mcg/act) 4 puffs q4hr PRN	STEP 3 Fluticasone (110 mcg/act) 2 puffs BID + Albuterol (90 mcg/act) 4 puffs q4hr PRN	STEP 4 Consult Pulmonary
4-11 years old	STEP 1 Reliever only. Albuterol (90 mcg/act) 4 puffs q4hr PRN	STEP 2 Fluticasone (44 mcg/act) 2 puffs BID + Albuterol (90 mcg/act) 4 puffs q4hr PRN	STEP 3 Budesonide/Formoterol (80/4.5) 1 puff daily, and 1 puff PRN q5 minutes; max 8 puffs/day	STEP 4 Consult pulmonary
12+ years old	STEP 1 Reliever only. Budesonide/formoterol (160/4.5) 1 puff PRN q5 minutes; max 12 puffs/day	STEP 2 Budesonide/formoterol (160/4.5) 1 puff PRN q5 minutes; max 12 puffs/day	STEP 3 Budesonide/Formoterol (160/4.5) 2 puffs daily, and 1 puff PRN q5 minutes; max 12 puffs/day	STEP 4 Consult pulmonary

For patients newly starting SMART, please prescribe 2 inhalers for adequate medication supply for maintenance and reliever treatment.

Step 4:
Consult

Consult Pulmonology if patient requires Step 5 treatment, or as needed

Conversion Chart

If insurance does not cover the recommended medication, see equivalent doses of inhaled steroids

Estimated Comparative DAILY Medication Dosages for Inhaled Corticosteroids (dosing ranges from NHLBI 2007 and GINA 2026 Guidelines)

	Fluticasone (Flovent) inhaler	Budesonide (Pulmicort) nebulizer	Budesonide/Formoterol (Symbicort) inhaler
Low dose 0-4 years	176 mcg	0.25-0.5 mg	
Low dose 5-11 years	88 mcg – 176 mcg		160 mcg – 320 mcg
Low dose 12+ years	88 mcg – 264 mcg		320 mcg
Medium dose 0-4 years	176 mcg – 352 mcg	1 mg	
Medium dose 5-11 years	176 mcg – 352 mcg		320 mcg – 640 mcg
Medium dose 12+ years	264 mcg – 440 mcg		640 mcg
High dose 0-4 years	>352 mcg	2 mg	
High dose 5-11 years	>352 mcg		
High dose 12+ years	>440 mcg		

SMART Medication Dosing Conversion for Insurance Coverage

Budesonide/Formoterol (Symbicort)	Mometasone/Formoterol (Dulera)
80/4.5 mcg	100/5 mcg
160/4.5 mcg	200/5 mcg

Beclomethasone dipropionate (Qvar) no longer recommended

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 (i.e., treatment for mild to moderate persistent asthma)
 - Benefits:
 - Reduces exacerbations requiring systemic corticosteroids (35-51%)
 - Reduces overall steroid exposure

Single Maintenance and Reliever Therapy (SMART) ¹¹

-
- 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.

- For patients discharged on SMART therapy, please use the SMARTphrase “.SMARTAsthmaDischarge”
- The SMARTphrase details caregiver/patient instructions for the transition from hospital to home asthma medications
- May also refer to VNA for in-home post-discharge asthma teaching

Discharge Criteria:

No further need for supplemental oxygen, MPIS ≤ 5 on q4hr albuterol, hydrated without need for IVFs, asthma home treatment plan completed and family given copy, asthma education completed, appropriate follow up in place

Discharge Instructions:

- Outline discharge medications in Asthma Home Treatment Plan
- **Albuterol** MDI with spacer: 4 puffs (or 2.5mg via neb) q4hr while awake
- **Oral Systemic Steroid** x3-5 day total. Options (select one):
 - (1) 2nd dose of dexamethasone prior to discharge (24 hours after 1st dose)
 - (2) Prescribe prednisone/prednisolone 2 mg/kg (max 50-60 mg) once daily in the morning x3-5 days total
 - (3) If too early for 2nd dose of dexamethasone prior to discharge, prescribe dexamethasone 0.6 mg/kg (max 16 mg) once 24 hours after last dose to home pharmacy. Use closest half or full tablet dose. **Recommend tablets** to avoid needing prior authorization for liquid formulation (can be crushed if necessary).
- **Controller Therapy**, based on chronic severity ([Appendix B](#))
- If discharging on SMART, use dotphrase “.SMARTAsthmaDischarge” on discharge instructions to guide hospital-to-home medication transition
- Refer to VNA for post-discharge asthma teaching
- Screen for Influenza vaccine (Oct-March) and administer, if indicated

Your child was admitted for treatment of an asthma exacerbation - otherwise known as an “asthma attack.” During their stay, they received breathing treatments and other medications to help treat this exacerbation by helping to open up and decrease inflammation in their airways.

Your child was started on SMART (Single Maintenance And Reliever Therapy) to improve their asthma control. This new plan uses a single medication for when your child is well and when they are having symptoms. This new combination medicine contains a controller (an inhaled steroid) and a reliever/rescue medication, in a single inhaler. Simply put - NO MORE ALBUTEROL once your child is back to baseline after this exacerbation.

For your child's SMART, we prescribed **SMART inhaler**. Please pick up this medication from your pharmacy - make sure you have two identical inhalers, so you have enough puffs to use for controller and rescue. Unlike before, it will be the SAME inhaler for both. You can send an inhaler to school if your child usually takes asthma medication in school with activity.

This new SMART plan will work well once your child is back to their healthy baseline. As **Thiago** was admitted for an asthma exacerbation, you should continue the following until they see their primary care provider or they have been without asthma symptoms for 48 hours.

POST HOSPITAL DISCHARGE PLAN:

Hospital Bronchodilator until your child is symptoms free or at baseline for 24-48 hours

Steroid Daily Frequency daily for **Steroid course number of days** days

SMART inhaler *** puffs with spacer *** time(s) per day

you use your inhaler.

free/at baseline for 48 hours and has seen their primary care provider, you may discontinue their following:

with spacer *** time per day

spacer every 5 minutes up to *** puffs for symptoms of cough, wheezing, and shortness of

amount of puffs per day is *** and the maximum is **Maximum puffs**. Your child should not

Maximum puffs total puffs per day.

use your inhaler.

provider, if your child requires more than their maximum number of puffs per day. If your child's

after 3 days on this treatment plan, contact your healthcare provider or seek medical care. For medical

breathing problems (such as fast breathing, difficulty catching a breath), loss of consciousness,

or any other concerning change, please call 911.



Asthma Action Plan - English

← → ▾

Discharge.

Discharge

Discharge Deceased

Results Review

Manage Orders

Notes

Chart Review

Care Everywh...

Demographics

Growth Chart

Discharge.

Rounding

Problem List

Admission.

Transfer.

More ▶

Patient Overview

ED Overview

Care Teams

Active Orders

DISCHARGE ORDERS

BestPractice

Ord Rec Status

Rx Routing

Ord Reconciliation

Insulin Instructions

Med List

DISCHARGE DOCUMENTATION

Problem List

Active Infection

Outside Appts

DME Inst

W10 Inst

W10 Preview

W10 Print

After Visit Summary

Kids Health

Asthma Action Plan

Letters

Discharge Summary

Follow-up Providers

BILLING PROVIDER

CHARGES

Asthma Action Plan

Warning: this patient's asthma action plan has not been signed!

Asthma Action Plan

☐ Viewable in reports

☐ Patient declines asthma action plan

Asthma severity:

intermittent

mild persistent

moderate persistent

severe persistent

exercise induced bronchospasm

Asthma triggers:

animal dander

dust mites

cockroaches

indoor mold

pollen

cold air

outdoor mold

tobacco smoke

smoke, odors, and sprays

vacuum cleaning

exercise

respiratory infection

other (comment)

Green Zone

Daily Treatment Plan: Have the child take these medicines every day even when the child feels well

Inhaled Medication	Inhaled Medication Dose	Inhaled Medication Frequency

Other Medication	Other Medication Dose	Other Medication Frequency

Pre-Exercise Medication	Pre-Exercise Medication Dose	Pre-Exercise Medication Frequency

Asthma Action Plan - Spanish

Discharge.

Discharge

Discharge Deceased

OVERVIEW

Patient Overview

ED Overview

Care Teams

Active Orders

DISCHARGE ORDERS

BestPractice

Ord Rec Status

Rx Routing

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Insulin Instructions

Med List

DISCHARGE DOCUMENTATION

Problem List

Active Infection

Outside Appts

DME Inst

W10 Inst

W10 Preview

W10 Print

After Visit Summary

Kids Health

Asthma Action Plan

Letters

Letters

Search all contacts



1 PCP

2 Referring

3 Patient

4 Print For Patient

5 Care Team

6 All Referring

7 OB Providers

8 Previous

9 Last

Free Text

> To: No recipient selected

School Note

Spanish Asthma Treat...

Return to Work Letter

Gen Med Auth Letter

Albuterol MDI Auth Letter

Copy Letter

Other

Prov Bronchiolitis Letter



Letter: No letter selected

From: GIUDICE, CHRISTIN.

+ Attach File



Attachments: No attachments

☐ Wait for results

☐ Wait for transcriptions

☐ Route draft

+ New Communication



Preview

Pend

Send Now

Cancel

Restore

Close

Previous

Next

Discharge Summary

+ Create Note in NoteWriter



+ Create Note

See All Notes

Refresh

Incomplete D/C Summary Notes

Author

Service

Author Type

Cosign

File Time

Date of Service

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 B 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 B (based on recommendations from National Asthma Education and Prevention Program)
- Every child should be screened for flu vaccine (when appropriate) and given an Asthma Action Plan prior to discharge
- New Appendix C with tips for asthma documentation and billing for critical care
- New EPIC SMARTphrase, “.SMARTAsthmaDischarge” with discharge instruction for patients transitioning from hospital to home SMART therapy asthma medications

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

! Admit to MS - Asthma Manage My Version ▾ ⤴

▾ General

▾ ADT

- ☐ Admit to Inpatient
- ☐ Place Patient in Observation

▾ Pathway

- ☒ Initiate Clinical Pathway: Asthma
Until discontinued starting Today at 1054 Until Specified

▾ Communication for Possible Discharge

- ☒ Communication for Possible Discharge - Asthma
Routine, Once First occurrence Today at 1054
! MPIS $\leq$ 5 on Albuterol(x2 in a row) per Asthma Pathway: Yes
Asthma Home Treatment Plan and Triggers completed and reviewed with family: Yes
Asthma Education with MDI+Spacer teaching complete: Yes

▾ Nursing

▾ Isolation

- ☐ Contact isolation status
- ☐ Droplet isolation status

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.

▼ Phase 1 - MPIS ≥ 11 and < 20 Kg —

☐ Phase 1 - MPIS ≥ 11 and < 20 Kg

▼ Phase 1 - MPIS ≥ 11 and ≥ 20 Kg —

☐ Phase 1 - MPIS ≥ 11 and ≥ 20 Kg

▼ Phase 2 - MPIS 7-10 —

☐ Phase 2 - MPIS 7-10

☐ Albuterol Every 2 Hours

▼ Phase 3 - MPIS ≤ 6 —

☐ Phase 3 - MPIS ≤ 6

☐ Albuterol Every 4 Hours

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)

▼ Phase 1 - MPIS ≥ 11 and < 20 Kg

☒ Phase 1 - MPIS ≥ 11 and < 20 Kg

☒ Cardiorespiratory monitoring

! Routine, Continuous starting Today at 1111 Until Specified

☒ Pulse oximetry

! Routine, Continuous starting Today at 1111 Until Specified

☒ MPIS

! Routine, starting Today at 1110 Until Specified

☐ prednisOLONE (ORAPRED) 15 mg/5 mL solution
1 mg/kg, Oral, Every 12 hours

☐ predniSONE (DELTASONE) tablet
1 mg/kg, Oral, Every 12 hours

☐ methylPREDNISolone sodium succinate (Solu-MEDROL) in NS IV
Intravenous, Every 6 hours

☐ ranitidine (zANTAc) IV
1 mg/kg, Intravenous, Every 8 hours

☐ albuterol (PROVENTIL) 5 mg/mL (0.5%) nebulizer solution
10 mg/hr, Nebulization, Continuous

☒ Oxygen therapy via nebulizer

Until discontinued starting Today at 1111 Until Specified

! P Please notify MD/CP if the following occurs: 1.) O2 requirement reaches max; consider weaning the amount of oxygen delivered every 60 minutes.

☒ Diet regular

Diet effective now starting Today at 1111 Until Specified

P Does the patient have any food allergies? (Note- do not order a regular diet if patient has known food allergies)

☐ Xray chest AP only

☐ I-STAT BLOOD GAS

☐ Consult, Critical Care

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.

▼ Respiratory Therapy

▼ Respiratory Therapy Interventions

- ☒ Initiate Albuterol Wean Protocol
Until discontinued starting Today at 1054 Until Specified
- ☒ Education - Asthma
Until discontinued starting Today at 1054 Until Specified
Provide education on: MDI

▼ Therapies/Family Support

▼ Family Support Services

- ☐ Child Life services
- ☐ Family support services
- ☐ Pastoral care services

▼ Consults

▼ Consults

- ☐ Consult, Pulmonary

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

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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.