

CLINICAL PATHWAY: Inpatient Asthma

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

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 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 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

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

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
- Reference [Appendix C](#) for Critical Care Billing when Initiating Continuous Albuterol

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 ≥90%
- Intermittent pulse oximetry if no hypoxemia

Improvement?
(MPIS ≤6 x 2)

No

Yes

Continue on pathway as MPIS dictates

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

Improvement?
(MPIS ≤10 x 2)

No

Yes

Initiate Phase 2 and follow pathway

- Increase Albuterol to 20 mg/hr if on 10 mg/hr
- Notify attending
- If magnesium sulfate not already given:
 - Consider 20 ml/kg NS bolus, followed by IV Magnesium Sulfate 50 mg/kg (max 2 g daily) over 20 minutes
 - Place patient on continuous respiratory monitoring; obtain blood pressure before and after magnesium sulfate infusion

If MPIS ≥13:
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

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

NEXT PAGE

CONTACTS: CHRISTINA GIUDICE, APRN | ALEX HOGAN, MD | MELANIE SUE COLLINS, MD | ANAND SEKARAN, MD

LAST UPDATED: 05.19.26

©2019 Connecticut Children's Medical Center. All rights reserved.

CLINICAL PATHWAY: Inpatient Asthma Appendix A: Modified Pulmonary Index Score (MPIS) Chart

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

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



RETURN TO
THE BEGINNING



CONTACTS: CHRISTINA GIUDICE, APRN | ALEX HOGAN, MD | MELANIE SUE COLLINS, MD | ANAND SEKARAN, MD

LAST UPDATED: 05.19.26



CLINICAL PATHWAY:

Inpatient Asthma

Appendix B: Assessing Asthma Severity and Treatment Recommendations

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

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

NO

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
--------------	-----------------	---------------------	-------------------

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 Reliever only. 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



RETURN TO
THE BEGINNING



CONTACTS: CHRISTINA GIUDICE, APRN | ALEX HOGAN, MD | MELANIE SUE COLLINS, MD | ANAND SEKARAN, MD

LAST UPDATED: 05.19.26

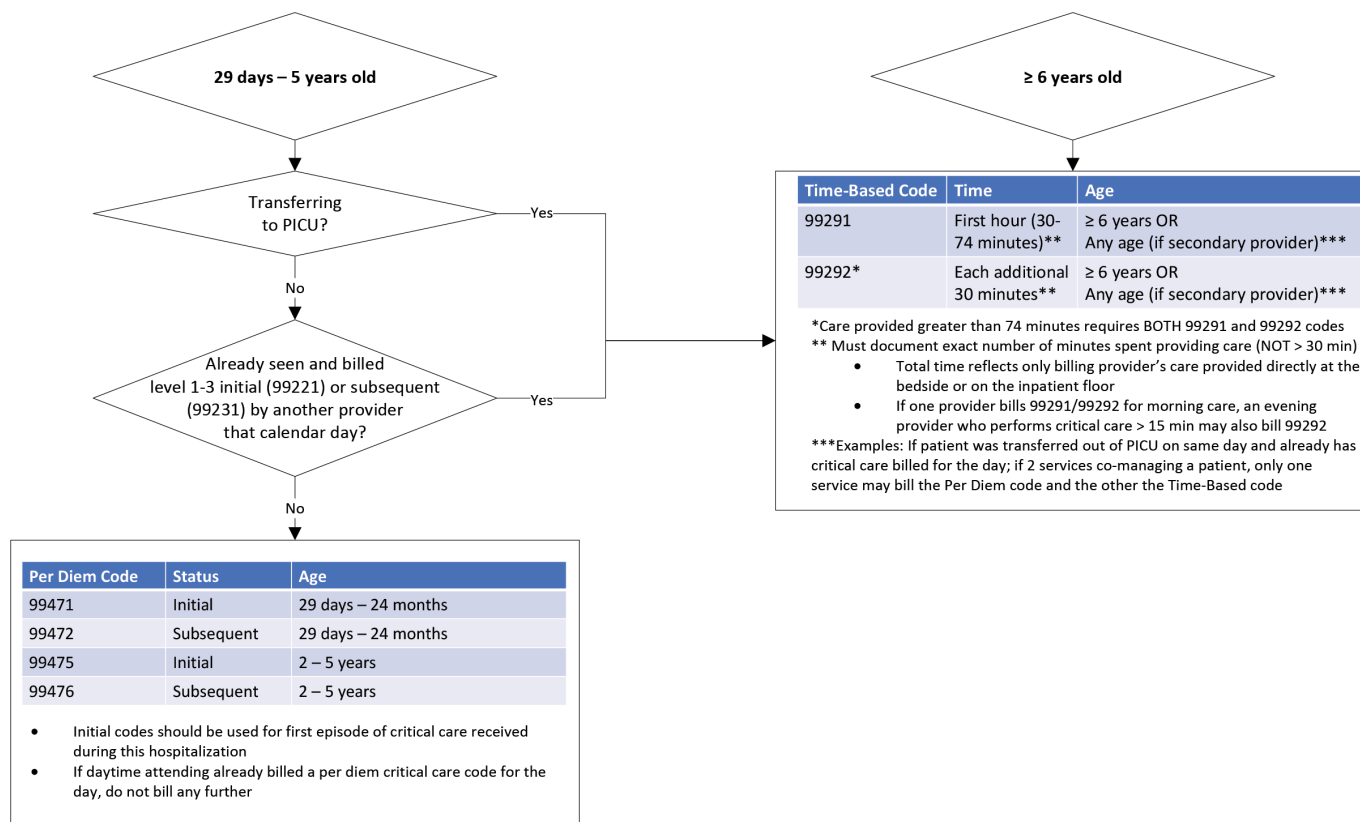
©2019 Connecticut Children's Medical Center. All rights reserved.



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

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

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



RETURN TO
THE BEGINNING

CONTACTS: CHRISTINA GIUDICE, APRN | ALEX HOGAN, MD | MELANIE SUE COLLINS, MD | ANAND SEKARAN, MD

LAST UPDATED: 05.19.26

©2019 Connecticut Children's Medical Center. All rights reserved.

