

ED OBSERVATION UNIT: ASTHMA GUIDELINES NYC H+H KINGS COUNTY HOSPITAL CENTER

General Observation Guidelines apply for all ED observation patients.

INCLUSION CRITERIA	
<ul style="list-style-type: none"> • Clinical impression consistent with asthma or albuterol responsive bronchospasm • Initial treatment given (nebulizers x 3, steroids, magnesium) and intermediate response (improvement but still wheezing) • 	
EXCLUSION CRITERIA*	
Hemodynamic instability	<ul style="list-style-type: none"> • $O_2 < 92\%$, HR > 120, RR > 30, SBP < 90 mmHg • Pulsus paradoxus > 25 mmHg
Exam	<ul style="list-style-type: none"> • Absent breath sounds (silent chest) • Change in mental status - agitation, anxiety, lethargy, drowsy, confused • Unable to speak full sentences or phrases • Accessory muscle use • Inability to lie in supine position • Cyanosis
Testing	<ul style="list-style-type: none"> • Peak expiratory flow rate $< 40\%$ of baseline or predicted after treatment** • Hypercapnia - $PaCO_2 > 45$ mmHg on VBG (if done) • Radiographic evidence of complication requiring inpatient treatment (ie, PTX, PNA) • Cardiac dysrhythmia (ie, SVT)
ER Interventions	<ul style="list-style-type: none"> • Mechanical or NIPPV*** • Epinephrine or terbutaline (excluding pre-hospital)
Other	<ul style="list-style-type: none"> • Any other need for inpatient admission • Previous history of intubation for asthma • Any factor that will preclude discharge in 48 hours

* Criteria extrapolated from Milliman admission guidelines and the National Heart, Lung, and Blood Institute's description of severe asthma and high risk features of imminent respiratory failure.¹⁻³

**Refer to Mdcalc.com or Table 1 if height not available

***The use of NIPPV in asthma is not standard care and is lacking in high quality evidence.⁴⁻⁵ There is practice variation among ER providers and therefore whether or not a patient was placed on NIPPV

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should **not independently** rule out or rule in a severe asthma exacerbation. Please refer to exclusion criteria.

INTERVENTIONS

- Bronchodilator nebulizers treatments q2-q4h
- Steroids if not already given in ED
- Supplemental O2 prn
- Serial peak flow measurements
- ED Care management consult
- Asthma education - compliance, identifying triggers, MDI teaching, smoking cessation

Persistent or worsening symptoms < 48 hr L.O.S.

- Increase frequency of nebulizer treatments
- Increasing supplemental oxygen requirement
- IV Magnesium sulfate
- IV steroids
- Consider continuous nebs/IM epinephrine and transfer to CCT for further stabilization if severe deterioration

DISPOSITION

Home:

- Major resolution of sob/wheezing
- Peak flow >70% of predicted/baseline or significant improvement from baseline
- Ambulating comfortably
- Ensured follow up (PMD or Asthma/Chest clinic)
- Medication prescribed
 - GINA recommends that all adults and adolescents with asthma should receive ICS-containing controller treatment, either as-needed (in mild asthma) or daily, to reduce their risk of serious exacerbations and to control symptoms
- Consider escalation of outpatient controller meds using stepwise approach if already compliant

Admission:

- Clinical deterioration to severe asthma exacerbation or imminent respiratory failure

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- For patients with persistent symptoms and/or exacerbations despite low dose ICS, consider step up but first check for common problems such as inhaler technique, adherence, persistent allergen exposure and comorbidities
- For adults and adolescents, the preferred step-up treatment is combination low dose ICS-long-acting beta₂-agonist (LABA).

Adults & adolescents 12+ years

Personalized asthma management: Assess, Adjust, Review response

Symptoms
Exacerbations
Side-effects
Lung function
Patient satisfaction



Confirmation of diagnosis if necessary
Symptom control & modifiable risk factors (including lung function)
Comorbidities
Inhaler technique & adherence
Patient goals

Treatment of modifiable risk factors & comorbidities
Non-pharmacological strategies
Education & skills training
Asthma medications

Asthma medication options: Adjust treatment up and down for individual patient needs

PREFERRED CONTROLLER
to prevent exacerbations and control symptoms

Other controller options

PREFERRED RELIEVER

Other reliever option

STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
As-needed low dose ICS-formoterol*	Daily low dose inhaled corticosteroid (ICS), or as-needed low dose ICS-formoterol*	Low dose ICS-LABA	Medium dose ICS-LABA	High dose ICS-LABA
Low dose ICS taken whenever SABA is taken†	Leukotriene receptor antagonist (LTRA), or low dose ICS taken whenever SABA taken †	Medium dose ICS, or low dose ICS+LTRA#	High dose ICS, add-on tiotropium, or add-on LTRA#	Refer for phenotypic assessment ± add-on therapy, e.g. tiotropium, anti-IgE, anti-IL5/5R, anti-IL4R
As-needed low dose ICS-formoterol*	As-needed low dose ICS-formoterol*	As-needed low dose ICS-formoterol for patients prescribed maintenance and reliever therapy‡		Add low dose OCS, but consider side-effects
		As-needed short-acting β ₂ -agonist (SABA)		

* Off-label; data only with budesonide-formoterol (bud-form)

† Off-label; separate or combination ICS and SABA inhalers

‡ Low-dose ICS-form is the reliever for patients prescribed bud-form or BDP-form maintenance and reliever therapy

Consider adding HDM SLIT for sensitized patients with allergic rhinitis and FEV₁ >70% predicted

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Table 1: Suggested Peak Flow Rate When Height and Baseline measurements are not available ⁶

Asthma Severity	Peak Flow (L/min)	
	Men	Women
Mild	>400	> 300
Moderate	250 - 399	200 - 299
Severe	150 - 249	120 - 200
Very Severe	<150	< 120

Sources

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3. Hodder R, Loughheed MD, Rowe BH, FitzGerald JM, Kaplan AG, McIvor RA. Management of acute asthma in adults in the emergency department: nonventilatory management. *CMAJ*. 2010;182(2):E55–E67. doi:10.1503/cmaj.080072
4. Landry A, Foran M, Koyfman A. Does Noninvasive Positive-Pressure Ventilation Improve Outcomes in Severe Asthma Exacerbations? *Ann Emerg Med* 2013;62(6):594-596
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6. Tsai CL, Clark S, Camargo CA, Jr. Risk stratification for hospitalization in acute asthma: the CHOP classification tree. *Am J Emerg Med*. 2010;28(7):803-808.
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