

## Assessment and Management of Asthma Exacerbation in Urgent Care: Part 2

**Urgent message:** The second part in a two-part series offers expert guidance on short and long-term management of the disease in the urgent care setting through the use of pharmacotherapy, protocols for treatment, and a written asthma action plan at discharge.

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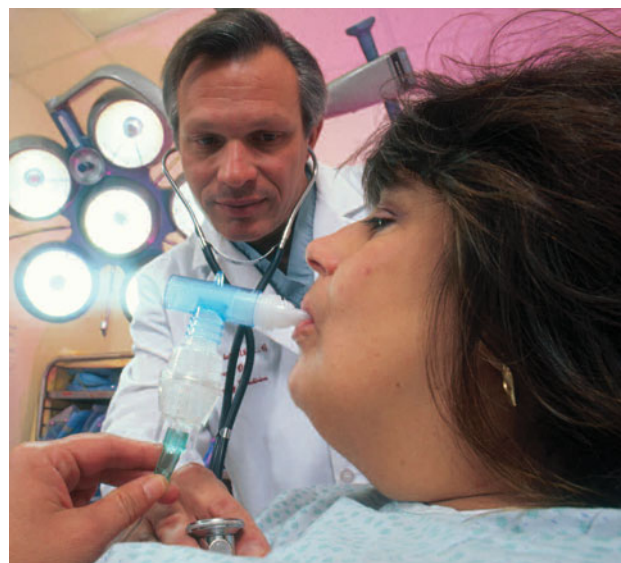
### Introduction

Once the suspicion of an asthma exacerbation exists, short term management is focused on reducing the severity of the exacerbation, with the hopes of discharging the patient home for outpatient follow-up. This can be achieved through pharmacotherapy that reduces inflammation and relaxes the airway musculature, in hopes of reversing airflow obstruction. Long-term management is focused on prevention of future exacerbations through pharmacotherapy and education at discharge. Understanding the rationale behind short and long-term management of a suspected asthma exacerbation will lead to more efficient assessment and effective discharge of patients presenting to an urgent care center.

### Pharmacotherapy

Pharmacotherapy for asthma generally can be divided

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into quick-relief short-term medications (short-acting beta<sub>2</sub> agonists [SABAs], anticholinergics, and oral/systemic corticosteroids), and long-term controller medications (inhaled corticosteroids, long-acting B<sub>2</sub> agonists [LABAs], leukotriene antagonists, and immunomodulators). Complementary and alternative medications (CAM) comprise another fast-growing subset of pharma-

Table 1. Dosages of Selected Drugs for Asthma Exacerbations in Urgent Care*		
Medication	Dosages	
	Child Dose ( $\leq 12$ years)	Adult dose
<b>Albuterol (Inhaled SABA)<sup>a</sup></b>		
Nebulizer solution (0.63 mg/3 mL, 1.25 mg/3 mL, 2.5 mg/3 mL, 5.0 mg/mL)	0.15 mg/kg (minimum dose 2.5 mg) every 20 minutes for 3 doses then 0.15–0.3 mg/kg up to 10 mg every 1–4 hours as needed, or 0.5 mg/kg/hour by continuous nebulization.	2.5–5 mg every 20 minutes for 3 doses, then 2.5–10 mg every 1–4 hours as needed, or 10–15 mg/hour continuously.
Metered Dose Inhaler (MDI) <sup>a</sup> (90 mcg/puff)	4–8 puffs every 20 minutes for 3 doses, then every 1–4 hours inhalation maneuver as needed. Use VHC <sup>b</sup> ; add mask in children <4 years.	4–8 puffs every 20 minutes up to 4 hours, then every 1–4 hours as needed.
<b>Epinephrine (Systemic SABA)</b> 1:1,000 (1 mg/mL)	0.01 mg/kg up to 0.3–0.5 mg every 20 minutes for 3 doses	0.3–0.5 mg every 20 minutes for 3 doses
<b>Ipratropium Bromide</b>	<b>(Anticholinergic)<sup>b</sup></b>	
Nebulizer solution (0.25 mg/mL)	0.25–0.5 mg every 20 minutes for 3 doses, then as needed	0.5 mg every 20 minutes for 3 doses then as needed
MDI <sup>a</sup> (18 mcg/puff)	4–8 puffs every 20 minutes as needed up to 3 hours	8 puffs every 20 minutes as needed up to 3 hours
<b>Ipratropium With Albuterol<sup>c</sup></b>		
Nebulizer solution (Each 3 mL vial contains 0.5 mg ipratropium bromide and 2.5 mg albuterol.)	1.5–3 mL every 20 minutes for 3 doses, then as needed	3 mL every 20 minutes for 3 doses, then as needed
MDI <sup>a</sup> (Each puff contains 18 mcg ipratropium bromide and 90 mcg of albuterol.)	4–8 puffs every 20 minutes as needed up to 3 hours	8 puffs every 20 minutes as needed up to 3 hours
<b>Steroids</b>	1–2 mg/kg in 2 divided doses (maximum = 60 mg/day) until PEF is 70% of predicted or personal best	40–80 mg/day in 1 or 2 divided doses until PEF reaches 70% of predicted or personal best
<b>Prednisone</b>		
<b>Methylprednisolone</b>		
<b>Prednisolone</b>		
* Adapted from the National Heart, Lung, and Blood Institute National Asthma Education and Prevention Program Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma Full Report [EPR-3].		
a. In mild-to-moderate exacerbations, MDI plus VHC is as effective as nebulized therapy with appropriate administration technique and coaching by trained personnel. MDI should be used with VHC and a facemask in children aged <4 years.		
b. Can mix in same nebulizer with albuterol (see below). Should not be used as first-line therapy; should be added to SABA therapy for severe exacerbations.		
c. Can be used for up to 3 hours in initial management of severe exacerbations.		
MDI = metered-dose inhaler; VHC = valved holding chamber; SABA = short-acting beta <sub>2</sub> -agonist		

cotherapy (acupuncture, chiropractic therapy, homeopathic and herbal medicine, breathing and relaxation techniques, and yoga). In the urgent care setting, quick-relief medications are the mainstay of treatment.

Although this review focuses on several forms of specific quick-relief, short-term pharmacotherapy (**Table 1**), urgent care providers should be familiar with the various other treatment options, their appropriate use, and possible misuse. For example, a patient whose history sug-

gests a severity classification of persistent asthma should be on an inhaled corticosteroid (unless contraindicated).<sup>1</sup> A second example is the misconception patients often have (personal experience) about the use of LABAs during acute exacerbations. LABAs *are not* recommended in acute asthma exacerbations.<sup>1</sup> Patients, however, may not be aware of that fact, and may attempt to use long-term controller medication for acute relief. Familiarity with these and other facts about the various long-term controller

**Table 2. Risk Factors for Death From Asthma\***

<p><b>Asthma history</b></p> <ul style="list-style-type: none"> <li>• Previous severe exacerbation requiring intubation or intensive care unit admission for asthma</li> <li>• Two or more hospitalizations for asthma in the past year</li> <li>• Three or more emergency department (ED) visits for asthma in the past year</li> <li>• Hospitalization or ED visit for asthma in the past month</li> <li>• Using &gt;2 canisters of a short-acting beta<sub>2</sub>-agonist per month</li> <li>• Sensitivity to Alternaria</li> </ul>
<p><b>Social history</b></p> <ul style="list-style-type: none"> <li>• Low socioeconomic status</li> <li>• Inner city residence</li> <li>• Illicit drug use</li> <li>• Major psychosocial problems</li> </ul>
<p><b>Comorbidities</b></p> <ul style="list-style-type: none"> <li>• Cardiovascular disease</li> <li>• Other chronic lung disease</li> <li>• Chronic psychiatric disease</li> </ul>
<p><b>Other</b></p> <ul style="list-style-type: none"> <li>• Lack of a written asthma plan</li> </ul>
<p>* Adapted from the National Heart, Lung, and Blood Institute National Asthma Education and Prevention Program Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma Full Report [EPR-3].</p>

medications and CAM will facilitate more efficient assessment of the severity and control of a patient's asthma, and help to create a more effective discharge plan. A patient who is noncompliant with medications or not on appropriate therapy is at increased risk of recurrent exacerbations and increased morbidity. A nice overview of long-term controller and CAM options can be found in the EPR-3 report (pages 216-235;242).<sup>1</sup>

SABAs are the most effective asthma therapy for rapid relief of symptoms and reversal of airflow obstruction.<sup>1,2</sup> The EPR-3 recommends using SABAs only when necessary for symptom relief (i.e they *should not* be used on a continuous daily basis), or before anticipated exposure to known asthma triggers. SABAs should be used in all patients with asthma exacerbation (unless contraindicated). The dosage and delivery mechanism will be dependent on the severity of the presentation (**Table 1**). Anticholinergics are not recommended as monotherapy for quick relief of asthma symptoms.<sup>1,2</sup> They can be used in combination with SABAs in severe presentations. The use of steroids should be oral rather than intravenous (IV) in the urgent care setting unless a patient is unable to take oral medications, or is approaching impending respiratory failure. Oral administration of prednisone has been shown to have effects equivalent to those of IV methylprednisolone, and in the opinion of the

EPR-3 expert panel, is usually preferred because it is less invasive. There is no known advantage for higher doses of corticosteroids in severe asthma exacerbations. The total course of systemic corticosteroids for an asthma exacerbation requiring an urgent care visit may last from 3 to 10 days. For corticosteroid courses of less than 1 week, there is no need to taper the dose. For slightly longer courses (e.g., up to 10 days), a taper can be considered; however, there probably is no need to taper, especially if patients are concurrently taking inhaled corticosteroids.

### Management of asthma exacerbations in the ambulatory/urgent care setting

Establishing protocols for treatment based on current management guidelines can facilitate improved care of patients with asthma.<sup>1,3</sup> A sample protocol is given in **Figure 1**. First-line treatment of suspected or diagnosed asthma exacerbations includes SABAs for all patients and oxygen, if necessary. Continuous administration of SABAs is the most effective means of reversing airflow obstruction.<sup>1</sup> The onset of action for SABAs is less than 5 minutes and repetitive administration produces incremental bronchodilation. Most patients will have a significant response after the first dose. It is recommended that patients who have a rapid response be observed for 30 to 60 minutes after the most recent dose of bronchodilator to ensure stability of the response before discharge to home.<sup>1</sup> After initial administration, the frequency of administration should be judged based on improvement in airflow obstruction, improvement of presenting signs and symptoms, and the occurrence of any side effects. Nebulizer therapy may be preferred for patients who are unable to cooperate effectively in using a metered-dose inhaler. Adding ipratropium bromide to a selective SABA produces additional bronchodilation, resulting in fewer hospital admissions, particularly in patients who have severe airflow obstruction.<sup>1</sup> Administer supplemental oxygen to maintain an SaO<sub>2</sub> >90%. Monitor SaO<sub>2</sub> until a clear response to bronchodilator therapy has occurred. In patients who have not responded completely to initial SABA, systemic corticosteroids are recommended. These medications speed the resolution of airflow obstruction and reduce the rate of relapse and may reduce hospitalizations.<sup>1</sup> A short course (5-10 days) of oral corticosteroids should be given at discharge. Theophylline is not recommended for treatment in the urgent care setting because it does not appear to provide additional benefit. Antibiotics are generally not recommended, except as needed for co-morbid conditions that would require antibiotics. Other therapies not generally recommended include aggressive hydration, chest physical ther-

apy, mucolytics, and sedation. In particular, anxiolytic and hypnotic drugs are contraindicated in severely ill asthma patients because of their respiratory depressant effect.

### Discharge

The response to initial treatment is a better predictor of the need for hospitalization than the severity of an exacerbation on presentation.<sup>4-13</sup> Therefore *repeat assessment should be the primary factor* in the decision to discharge the patient home, versus admit to the hospital. In general, discharge is appropriate if forced expiratory volume (FEV<sub>1</sub>) or peak expiratory flow (PEF) has returned to 70% of predicted or personal best and symptoms are minimal or absent. Patients who have an incomplete response to therapy (FEV<sub>1</sub> or PEF 50% to 69% of predicted or personal best) and with mild symptoms should be assessed individually for their suitability for discharge home, with consideration given to factors listed in **Table 2** and **Figure 1**. Hospital admission is warranted if an incomplete or poor response persists. At discharge sufficient medications should be given for a patient to continue on the pre-

scribed treatment until follow-up. Follow-up should be to either to the patient's primary care provider or an asthma specialist. If an appointment can be scheduled prior to discharge, the likelihood that a patient will actually receive an appointment and follow up increases.<sup>14,15</sup> A written discharge plan should be reviewed with a patient, including review of discharge medications and patient education on the correct use of an inhaler. Discharge is also an opportunity to inform or reinforce the signs of an asthma exacerbation, because studies show that some patients are unable to perceive signs of deterioration that would indicate a need to increase medication.<sup>16,17</sup> This can be done through a written asthma action plan. Although the scientific evidence on written asthma treatment plans is inconclusive, studies do suggest that use of written plans may help patients improve control of their asthma, particularly with respect to prevention and management of asthma exacerbations, and they are recommended by the EPR-3.<sup>1,2</sup> A written asthma action plan includes two important elements: daily management of medications and environmental triggers information on how to rec-

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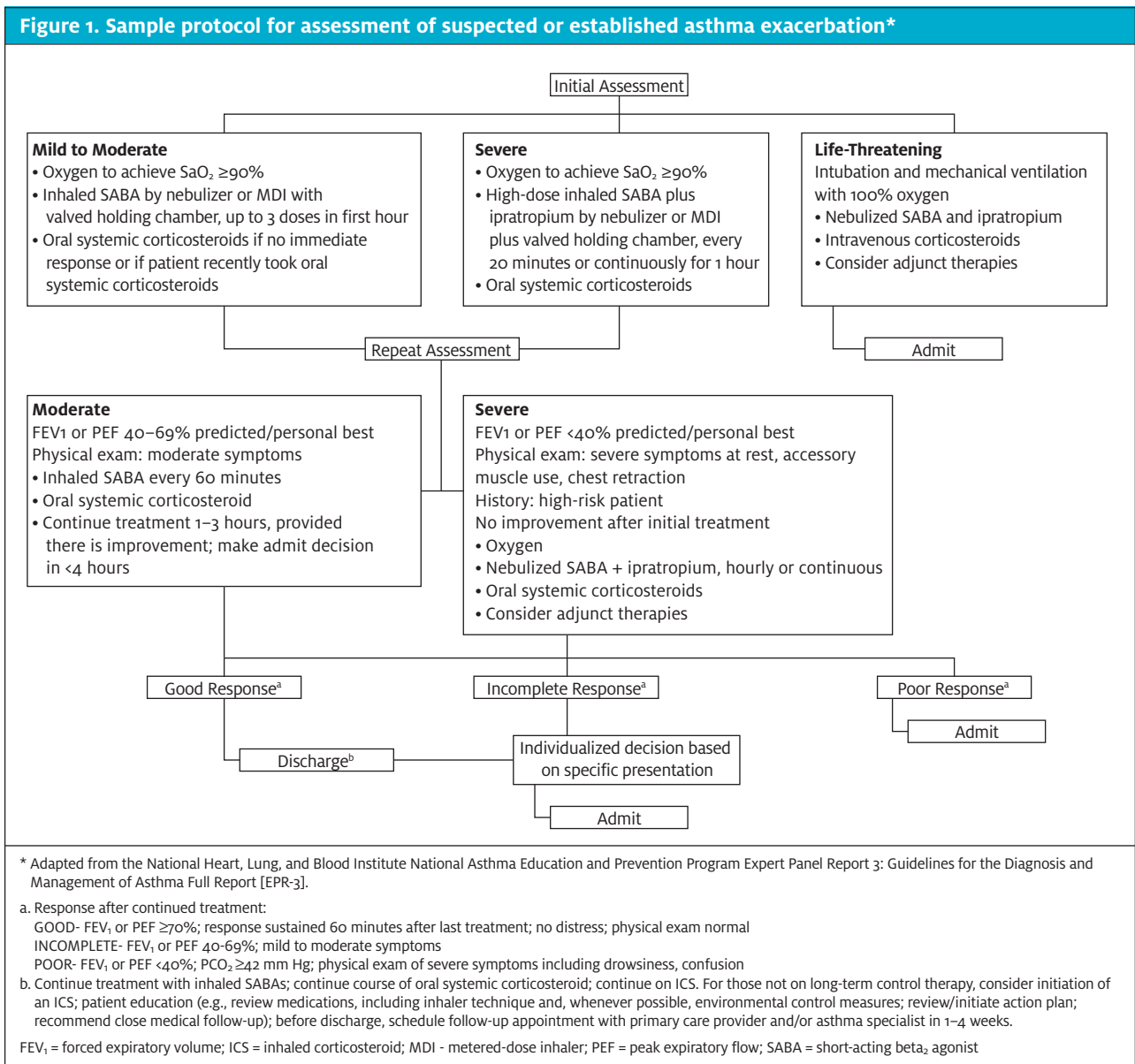
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ognize (i.e. signs and symptoms) and handle (i.e. medications, emergency contacts) worsening asthma.

A very nice example of a written asthma action plan for an adult and child can be found in the EPR-3 report (page 117-119).<sup>1</sup> A written asthma action plan is the most appropriate method to provide concise instructions on managing asthma symptoms in the ambulatory care setting.<sup>1,2</sup>

**Conclusion**

In a previous issue (Part 1), we discussed the pathogene-

sis of airway inflammation in asthma, key indicators for a diagnosis of asthma on history and examination, and key risk factors suggesting worse outcomes in patients with asthma exacerbations. In Part 2, we reviewed the short and longer-term management of these patients through the use of pharmacotherapy, protocols for treatment, and a written asthma action plan at discharge.

As we enter an era of health care in which decisions about treatment are increasingly patient-driven, urgent care centers will become a first choice for many patients seeking health care advice. The prevalence of asthma is

increasing, and current trends suggest that an increasing number of patients with acute asthma exacerbations will present to urgent care centers for treatment. Understanding the underlying pathogenesis of asthma will help the urgent care provider in doing an adequate medical history and examination in order to elicit risk factors associated with worse outcomes. Understanding the various pharmacotherapy and treatment options, and the development of protocols for short-term management of asthma, will improve the efficiency and efficacy of treatment for asthma exacerbations in the urgent care setting. A written asthma action plan can contribute to improved long-term control of asthma through prevention and management of asthma exacerbations, leading to decreased health care costs and improved long-term outcomes. ■

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