

Management of Severe Asthma before Referral to the Severe Asthma Specialist



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Overall Purpose/Goal: To provide excellent reviews on key aspects of allergic disease to those who research, treat, or manage allergic disease.

Target Audience: Physicians and researchers within the field of allergic disease.

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List of Design Committee Members: Tara F. Carr, MD, and Monica Kraft, MD

Learning objectives:

1. To recognize the impact and burden of severe asthma.
2. To understand the impact of comorbidities on severe asthma management.
3. To formulate a structured approach toward assessing and treating patients with severe asthma.

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Severe asthma is associated with significant morbidity and can be challenging to assess and control, due to heterogeneity of disease, complexity of diagnosis, and impact of comorbidities. A structured approach to the assessment and management of severe asthma may be helpful to the practicing clinician. First, it is

important to confirm a diagnosis of asthma. In patients who are either not responding to treatment, or who require high doses of medication to control symptoms, it is highly possible that disease mimickers or comorbidities are present and can inhibit therapeutic responsiveness. The assessment and management of common comorbidities of asthma may dramatically impact disease control and thus medication requirement. Determining medication adherence and optimizing drug dose and delivery may separate out truly severe asthmatics from those not using medications regularly or properly. Next, although true personalized medicine for severe asthma is not yet realized, for those individuals with severe asthma, phenotypic characteristics of each patient may guide which therapeutic options may be most effective for that patient. Finally, evaluation and management of severe asthma at a referral center can add additional phenotyping, therapeutic, and diagnostic strategies. © 2017 American Academy of Allergy, Asthma & Immunology (*J Allergy Clin Immunol Pract* 2017;5:877-86)

Key words: *Biologic therapy; Comorbidities; Adherence; Inhaled corticosteroid; Phenotype; Severe asthma*

Asthma is heterogeneous, both in the clinical presentation and characteristics, or phenotype, and in terms of severity.¹

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Abbreviations used

ABPA- Allergic bronchopulmonary aspergillosis
 AERD- Aspirin-exacerbated respiratory disease
 COPD- Chronic obstructive pulmonary disease
 CRS- Chronic rhinosinusitis
 DPI- Dry powder inhaler
 FeNO- Fractional exhaled nitric oxide
 FEF₂₅₋₇₅- Forced mid-expiratory flow between 25% and 75%
 FEV₁- Forced expiratory volume in 1 second
 FVC- Forced vital capacity
 GERD- Gastroesophageal reflux
 ICS- Inhaled corticosteroid
 HFA- Hydrofluoroalkane
 LABA- Long-acting β_2 -agonist
 LAMA- Long-acting muscarinic antagonists
 MMAD- Mass mean aerodynamic diameter
 SABA- Short-acting β_2 -agonist
 VCD- Vocal cord dysfunction

Management of asthma can be complex for providers and patients, particularly when the asthma is severe and/or difficult to control. This complexity is multifaceted: Challenges exist in asthma diagnosis, assessment, selection of therapy, confirmation of adherence, and evaluation of contributing comorbidities. Ideally, practitioners treating asthmatics will have access to a multidisciplinary team including nurses, respiratory therapists, psychologists/behavioral counselors, and social workers, to optimize care from every aspect. Barriers to synthesizing and implementing asthma recommendations and best practices include, among others, insufficient knowledge of recommendations, lack of time and resources, and financial constraints to providing care.² The purpose of this article is to discuss a practical, structured approach to assessment and management of severe asthma in a nonreferral center. Therefore, most recommended testing is generally widely available, and the treatment discussion will focus on those clinically available and FDA approved for asthma, or soon to be approved. This article is limited to a discussion of severe asthma in patients aged 6 to adult.

OVERVIEW OF ASTHMA

Asthma is a chronic inflammatory disease of the airways. Individuals with asthma may describe a spectrum of symptoms, including recurrent wheezing, dyspnea, chest tightness, and cough. These symptoms reflect episodes of reversible airflow obstruction, which may remit spontaneously or with treatment. Over time, many patients with asthma experience progressive airway remodeling, leading to an incompletely reversible, or fixed, airflow obstruction. Furthermore, inflammation in the asthmatic airway induces airway bronchial hyperresponsiveness to a variety of allergic, infectious, or irritant stimuli.

Asthma is a very common chronic disorder, and asthma prevalence is increasing with time,³ perhaps due to better recognition and phenotyping. Asthma severity can range from intermittent to severe; more severe asthma is associated with significant morbidity and mortality. Severe asthma is a major cause of morbidity and health care costs, and affects 10% of all patients with asthma, that is, approximately 2.5 million Americans. In 2013, in the United States, 3630 individuals died from asthma, or 9 people per day.^{3,4} These data suggest that asthma is

often poorly controlled, despite the availability of pharmacologic therapies that are recommended in National and International Asthma Guidelines.⁵⁻⁷

INITIAL APPROACH TO SEVERE ASTHMA IN THE CLINIC

We recommend a structured approach to the assessment and management of severe asthma (Figure 1). First, it is important to confirm a diagnosis of asthma, using history, physical examination, and appropriate objective testing. For those patients with suspected severe asthma, as defined by requirement of high-dose steroids for control or lack of control despite this therapy,⁶ it is highly possible that disease mimickers or comorbidities are present that may inhibit therapeutic responsiveness. Therefore, important comorbidities of asthma should be thoroughly assessed and treated. Importantly, determining medication adherence and optimizing drug dose and delivery may differentiate severe asthmatic patients from those not using medications regularly or properly. For those with confirmed severe asthma, we recommend additional objective testing and phenotyping assessments, which may help to guide treatment. Finally, we present additional workup and interventions that would be considered within a referral center, some of which may be available for patient care outside a referral center.

Confirm diagnosis of asthma

Accurate diagnosis of asthma is important, as treatment will benefit both morbidity and mortality from this disorder. As many diseases have overlapping clinical findings with asthma, accuracy of clinical diagnosis is critical for planning appropriate treatment strategies, particularly in the setting of severe asthma. Two guidelines documents—the Global Strategy for Asthma Management and Prevention 2016 report update⁷ and the National Institutes of Health Guidelines for the Diagnosis and Management of Asthma Expert Panel Report-3⁵—provide recommendations for the diagnosis of asthma and a framework for the treatment of asthma. These guidelines emphasize evaluation of impairment and risk, with ongoing assessment of control. The severity of asthma as measured through these domains is then used to guide treatment. The European Respiratory Society and American Thoracic Society Task Force document on Severe Asthma⁶ provides guidance on issues specific to severe asthma, including diagnosis and evaluation.

The assessment and diagnosis of asthma starts with a comprehensive medical history and physical examination. Symptoms may include cough, wheeze, chest tightness, chest heaviness, and/or breathlessness. An asthma-based medical history should include documentation of symptom and exacerbation quality, frequency, and severity.

A thorough physical examination can be very helpful for determining characteristics and comorbidities of asthma. A chest x-ray should be performed in patients with new-onset or significantly changing respiratory symptoms, to rule out the presence of overt structural disease, malignancy, and infection.

Lung function testing can confirm airflow obstruction and measure reversibility or variability of airflow obstruction. Spirometry is a widely available, inexpensive, noninvasive test that measures dynamic pulmonary function: expiratory and inspiratory flow rates and volumes. The ratio of forced expiratory volume in 1 second (FEV₁) to forced vital capacity (FVC) is used to diagnose airflow obstruction; a ratio value of less than the

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