



## SYSTEMIC APPROACH TO TREATING ADULT PATIENTS WITH ASTHMA

Asthma is a disease that primarily affects the lower respiratory tract. Asthma is characterized by episodic or persistent symptoms of wheezing, dyspnea, and cough. The diagnosis of asthma requires these symptoms and demonstration of reversible airway obstruction using spirometry. Inhaled short-acting  $\beta_2$ -agonists provides rapid relief of acute symptoms, but maintenance is controlled daily with inhaled corticosteroids. Combination therapy, including inhaled corticosteroids and long-acting  $\beta_2$ -agonists, is effective in patients who have prolonged symptoms with inhaled corticosteroids alone. The use of inhaled long-acting  $\beta_2$ -agonists alone is not appropriate. Other treatment options include long-acting muscarinic antagonists (e.g., tiotropium), and biological agents (e.g., omalizumab, mepolizumab, reslizumab). This issue of *CLIPs* briefly summarizes an article that evaluates the diagnosis and treatment of adults with asthma. If you need further information, please contact the Center for Healthcare Innovation and Patient Outcomes Research (CHIPOR) at [chipor@samford.edu](mailto:chipor@samford.edu).

**McCracken JL, Veeranki SP, Ameredes BT, Calhoun WJ. Diagnosis and management of asthma in adults: a review. *JAMA*. 2017 Jul 18;318(3):279-290. doi:10.1001/jama.2017.8372. PubMed PMID: 28719697.**

### Introduction

- Asthma affects approximately 7.5% of adults in the US and results in 10.5 million doctors' visits per year.
- Asthma is more common in African American (8.7%) and Puerto Rican Hispanic (13.3%) populations compared with White patients (7.6%).
- In addition, asthma-associated mortality is greater in blacks than whites (25.4 vs. 8.8 per million annually).
- Asthma is more common in women compared with men (9.6% vs. 5.1%).
- Inhaled corticosteroid use results in increased days without symptoms, improved lung functions, and reduced symptoms.
- Smokers with asthma have a relative resistance to inhaled corticosteroids.

### Methods

- Investigators reviewed studies, reports, and surveys pertaining to asthma in adults located using PubMed, MEDLINE, Cochrane Database of Systematic Reviews and other secondary literature searches from the inception of each database through March 2017.
- Search terms included "asthma", "anti-asthmatic drugs", "asthma management".
- Articles that fit the above description were screened and chosen by the investigators to be included in the review.

### Asthma Overview

- Asthma presents with episodic or persistent symptoms of wheezing, dyspnea, air hunger, and cough.
- Exacerbations result from exposure to allergens, irritants, viral upper respiratory tract infections, cold air, bacterial sinusitis, and exercise.
- Risk factors for developing asthma includes heredity, exposure to tobacco smoke, viral infections in the first 3 years of life, and socioeconomic factors.
- Atopic or allergic asthma is frequently associated with allergic rhinitis and conjunctivitis.
- Diagnosis and severity of asthma is based on history, physical examination, reversible airflow obstruction or airway hyperresponsiveness.
- Differential diagnosis includes congestive rhinopathy, obstructive sleep apnea, cystic fibrosis, pneumonia, congestive heart failure, pulmonary hypertension, and habitual cough.
- Pathophysiology of asthma includes variable airway obstruction, airway hyperresponsiveness, and airway inflammation.

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### Asthma Overview (continued)

- Spirometry is the most important diagnostic procedure for evaluating airway obstruction.
- Goals of asthma treatment are reducing symptoms, normal pulmonary function test, and minimizing risk.
- Pharmacological options are classified as reliever (short-term benefit) or controller. All patients should have access to a short acting  $\beta_2$  agonist inhaler for acute symptom treatment. A treatment algorithm for asthma can be found in table 1.
- Intermittent asthma is defined as symptoms occurring less than twice weekly with normal pulmonary function.
- Persistent asthma is defined as symptoms occurring more than twice weekly or abnormal pulmonary function.
- Therapy is determined based on asthma classification (intermittent; mild, moderate, or severe persistent).
- An asthma specialist is warranted for patients who are at step 4 or higher or who have life threatening exacerbation, poor response to prescribed treatment, occupational irritants, atypical presentation, requires more than two bursts of oral corticosteroids, or need specialized testing.
- All long-acting  $\beta_2$  agonists marketed in the US have a black box warning for increased risk of death and serious adverse events.
- Omalizumab and reslizumab carry black box warnings for anaphylaxis and use is generally limited to asthma specialist.
- Bronchial thermoplasty delivers radiofrequency energy to the airway.

**Table 1: Treatment Algorithm for Asthma**

Step	Type	Treatment
1	Intermittent Asthma	<b>Preferred: SABA prn (as needed)</b>
2	Persistent Asthma	<b>Preferred: Low-dose ICS</b> Alternative: LTRA
3	Persistent Asthma	<b>Preferred: Low dose ICS + LABA or Medium dose ICS</b> Alternative: Low dose ICS + either LTRA, or zileuton
4	Persistent Asthma	<b>Preferred: Medium dose ICS +LABA</b> Alternative: Medium dose ICS + either LTRA, or zileuton
5	Persistent Asthma	<b>Preferred: High dose ICS + LABA</b> AND consider omalizumab for patients who have allergies
6	Persistent Asthma	<b>Preferred: High dose ICS + LABA + oral corticosteroid</b> AND consider omalizumab for patients who have allergies

LABA- Long acting Beta Agonist (e.g., formoterol); LTRA- Leukotriene Receptor Antagonist (e.g., montelukast); ICS- Inhaled Corticosteroids (e.g., fluticasone)

### Conclusions

- Management of persistent asthma requires avoidance of aggravating environmental factors, availability of short-acting  $\beta_2$  agonists for rapid relief of symptoms, and daily use of inhaled corticosteroids.
- Patients with moderate or severe asthma may require long-acting bronchodilators and biologics.
- Patients with severe asthma typically find benefit in consultation with an asthma specialist for advanced treatment such as injectable biological agents.

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