



## **Asthma Practice Guidelines**

These standards of care seek to provide physicians and other health care providers with a means to set treatment goals, assess the quality of care provided, identify areas where more attention or self-management training are needed, and define timely and necessary referral patterns to appropriate specialists.

- I. **Medical History** - A detailed medical history of the new patient who is known or thought to have asthma should address the follow items:
  - A. Classification of severity based on current impairment and future risk
  - B. Patterns of symptoms (e.g. perennial, episodic, diurnal variations, exercise induced asthma).
    - *SECTION 4: Managing Asthma Long Term – Special Situations:* <http://www.ncbi.nlm.nih.gov/books/NBK7226/>
  - C. Precipitating and/or aggravating factors
  - D. Comorbid conditions that may affect asthma management (e.g. sinusitis, rhinitis, GERD)
  - E. Family history
  - F. Social history (to include characteristics of home environment, smoking, social factors influencing adherence)
  - G. Profile of typical exacerbation
  - H. Impact of asthma on patient and family
  - I. Assessment of patient's and family's perceptions of disease
  - J. Frequency of admission
  - K. Medications used
  - L. School/Work absenteeism (# of days absent because of asthma last school/work year.
  - M. Use of validated assessment tools, such as ATAQ or ACT questionnaires, can aid with patient symptom reporting.
  
- II. **Physical Examination** - The upper respiratory tract, chest, and skin are the focus of the physical examination for asthma. Physical findings that increase the probability of asthma include:
  - A. Respiratory Rate
  - B. Hyperexpansion of the thorax, especially in children; use of accessory muscles; appearance of hunched shoulders; and chest deformity.
  - C. Sounds of wheezing during normal breathing, or a prolonged phase of forced exhalation.
  - D. Increased nasal secretion, mucosal swelling, and nasal polyps.
  - E. Atopic dermatitis/eczema or any other manifestation of an allergic skin condition.
  
- III. **Pulmonary Function Testing (Spirometry)**
  - A. Spirometry should be performed using equipment and techniques that meet standards developed by the American Thoracic Society.

- B.** Office-based physicians who care for asthma patients should have access to a spirometry, either in their office or at a referral source, which is useful in both diagnosis and periodic monitoring for patients with asthma.
- C.** Spirometry measurements (FEV<sub>1</sub>, FVC, FEV<sub>1</sub>/FVC, FEF 25-75) before and after the patient inhales a short-acting bronchodilator should be considered at the initial assessment; after treatment is initiated to assess response; during progressive or prolonged loss of control; and at least every 1-2 years.
- D.** When condition deteriorates, shows severe abnormalities, or if questions arise regarding test accuracy or interpretation, further assessment should take place in a pulmonary function laboratory, to include consultation with a pulmonologist or allergist.

**IV. Additional Studies** - Although additional studies are not routine, they may be considered. The following procedures may be useful when considering alternative diagnoses, identifying precipitating factors, assessing severity, and investigating potential complications:

- A.** Additional pulmonary function studies (lung volumes, inspiratory and expiratory flow volume loops, and diffusing capacity tests).
- B.** Assessment of diurnal variation in peak expiratory flow over 1-2 weeks.
- C.** Bronchoprovocation with methacholine, histamine or exercise challenge (should be carried out by a trained individual in an appropriate facility, not recommended if FEV<sub>1</sub> is <65% predicted).
- D.** Chest x-ray.
- E.** Allergy testing.
- F.** Evaluation of the nose for nasal polyps and the sinuses for sinus disease.
- G.** Evaluation for gastroesophageal reflux.
- H.** When indicated CBC, immune globulin, RAST testing, Sweat Test.

**V. Goals of Asthma Therapy**

- A.** Prevent chronic and troublesome symptoms (e.g. coughing or breathlessness in the night, in the early morning, or after exertion).
- B.** Maintain (near) “normal” pulmonary function.
- C.** Maintain normal activity levels and growth (including exercise, school /work attendance and other physical activities).
- D.** Prevent recurrent exacerbations of asthma and minimize the need for emergency department visits or hospitalizations.
- E.** Provide optimal pharmacotherapy with minimal or no adverse effects.
- F.** Meet patients’ and families’ expectations of and satisfaction with asthma care.

- VI. **Anti-inflammatory Therapy** - Asthma is defined as a chronic inflammatory disorder of the airways. In susceptible individuals, this inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness and cough. Asthma medications are classified into two categories: *long-term-control* medications to achieve and maintain control of persistent asthma; and *quick-relief* medications to treat symptoms and exacerbations. The most effective medications for long-term control are those shown to have anti-inflammatory effects. Inhaled corticosteroids are the most effective long-term therapy available for mild, moderate or severe persistent asthma. In general, inhaled corticosteroids are well tolerated and safe at the recommended dosages. The potential but small risk of adverse events from the use of inhaled corticosteroids is well balanced by their efficacy. All inhaled asthma medications are best administered using an MDI with spacer and possibly a mask depending upon age of the patient. Also consider montelukast and/or cromolyn inhalation.

*FIGURE 4-5: Stepwise Approach for Managing Asthma in Youths >12 years and Adults:*

<http://www.ncbi.nlm.nih.gov/books/NBK7222/figure/A2212/?report=objectonly>

The FDA approved Breo (*fluticasone & vilanterol*), by inhalation, for use in adults and children over 18 years old for use as a controller in asthma and COPD in May 2013.

- VII. **Periodic Assessment and Monitoring** - The purpose of periodic assessment and ongoing monitoring is to determine whether the goals of asthma therapy are being achieved. Patients should be assessed and initial level of severity documented. (e.g. mild, intermittent, severe) Level of control (e.g. well controlled, not well controlled, very poorly controlled) should be assessed at all subsequent visits. The interval of visits depends on the degree of control, the level of therapy required, and the need to step up or down therapy. Patients with mild intermittent or mild persistent asthma that has been under control for at least three months should be seen by a clinician about every six months. Those classified as more severe, or who may require a step up in therapy may need to be seen at 2- to 6- week intervals.

Patients with uncontrolled and/or severe persistent asthma and those needing additional supervision to help them follow their treatment plan need to be seen more often.

### **Asthma Teaching**

- A. Every patient with asthma should be taught to recognize symptom patterns that indicate inadequate asthma control.
- B. Symptoms and clinical signs of asthma should be assessed at each healthcare visit through physical examination and appropriate questions.
- C. Any detailed symptoms history should be based on a short (2 to 4 weeks) recall period.

- D. Assessment of symptoms history should include daytime asthma symptoms; nocturnal awakening as a result of asthma symptoms; symptoms early in the morning not improved within 15 minutes after inhaling a short-acting beta2 -agonist.
- E. A formal ASTHMA ACTION PLAN should be developed for every patient diagnosed with persistent asthma.
- F. Spirometry testing should be done, after treatment is initiated and symptoms and peak expiratory flow have stabilized to document attainment of (near) “normal” airway function, at last every 1 to 2 years to assess the maintenance of airway function.
- G. Patients with persistent asthma may benefit from having a peak flow monitor at home and learning how to monitor their PEF on a long-term daily basis, and also during exacerbations of asthma.
- H. Key areas of quality of life/functional status should be assessed periodically (missed work/school, reduction in usual activities, disturbances in sleep, changes in caregiver activities due to a child’s asthma).
- I. Patients should be queried, and providers evaluate any records of self-monitoring, to detect exacerbations, both self-treated and those treated by other healthcare providers.
- J. Pharmacotherapy should be monitored for: patient adherence to the regimen, inhaler technique, level of usage of short-acting beta2-agonist versus oral corticosteroid “burst” therapy, changes in dosage of inhaled anti-inflammatory or other long-term control medications, and adverse effects of medications.
- K. Immunizations – all routine immunizations should be up to date. Influenza vaccination should also be administered annually.
- L. Providers should routinely assess the effectiveness of patient/provider communications and evaluate patient satisfaction with asthma control and quality of care.

## **VIII. Patient Education**

- A. Patient education should begin at the time of diagnosis and be integrated into every step of medical care, in the context of medical appointments and other clinician-patient communication.
- B. When nurses, pharmacists, respiratory therapists, and other healthcare professionals are available to support and expand patient education, a team approach should be used. The principal clinician should introduce the key educational messages and negotiate agreements with patients.
- C. Team members should document in the patient’s record the key educational points, patient concerns, and actions the patient agrees to take.
- D. Providers should teach patients and families essential information concerning asthma, medication skills, self-monitoring techniques, and environmental control measures.

- E. Providers should develop a written, individualized, self-management plan, in consultation with the patient. This plan should both instruct patients on daily self management as well as help the patient manage acute exacerbations and emergencies.
- F. Encourage adherence by: promoting open communication; eliciting and addressing patient's concerns; assessing patient's/family's perception of level of severity of the disease; assessing for level of social support; encouraging family involvement; and using methods that increase chances of compliance with written daily self-management plan.
- G. Providers should demonstrate, teach, or review e correct inhaler/spacer/holding chamber technique at each visit because these skills deteriorate rapidly. Instruct on the need for mouth care after use of inhaled steroids.
- H. Patients should be given simple, brief, written materials that reinforce the actions recommended and skills taught.

**IX. General Guidelines for Referral to an Asthma Specialist (e.g. Allergist, Pulmonologist, Critical Care Medicine)**

- A. Patient has had a life-threatening asthma exacerbation. (e. g. ICU admit)
- B. Patient is not meeting the goals of asthma therapy after 3 to 6 months of treatment. An earlier referral or consultation is appropriate if the physician concludes that the patient is unresponsive to therapy.
- C. Signs and symptoms are atypical or there are problems in differential diagnosis.
- D. Other conditions complicate asthma or its diagnosis (e.g. sinusitis, nasal polyps, aspergillosis, severe rhinitis, vocal cord dysfunction, gastroesophageal reflux, and chronic obstructive pulmonary disease).
- E. Additional diagnostic testing is indicated (e.g. allergy skin testing, rhinoscopy, pulmonary function studies, provocative challenge, and bronchoscopy).
- F. Patient requires additional education and guidance on complications of therapy, problems with adherence, or allergen avoidance.
- G. Patient is being considered for immunotherapy (especially if inhalant allergens trigger the asthma).
- H. Patient has severe, persistent asthma, requiring step 4 care.
- I. Patient requires continuous oral corticosteroid therapy or high dose inhaled corticosteroids, or has required more than two bursts of oral corticosteroids in one year.
- J. Patient is under age 3 and requires step 3 or 4 care. When the patient is under age 3 and requires step 2 care or initiation of daily long-term therapy, referral should be considered.
- K. Patient requires confirmation of a history that suggests that an occupational or environmental inhalant or ingested substance is provoking or contributing to asthma.

## **X. Special Considerations for Infants and Children**

- A.** Spirometry is generally valuable in children over age 4; however, some children cannot conduct the maneuver adequately until after age 7.
- B.** Under diagnosis of asthma is a frequent problem, especially in children who wheeze when they have respiratory infections. These children are often labeled as having bronchitis, bronchiolitis, or pneumonia, even though the signs and symptoms are most compatible with a diagnosis of asthma. *Recurrent episodes of cough and wheezing are almost always due to asthma in both children and adults.* A diagnostic trial of inhaled bronchodilators and anti-inflammatory medications may be helpful.
- C.** Chronic asthma may start as early as the first year of life among infants with a family history of asthma, persistent rhinorrhea, atopic dermatitis, or high IgE levels. Early identification of these infants allows institution of environmental controls to reduce exposure to tobacco smoke, animal dander and house-dust mites.
- D.** PEF results may be unreliable in some very young patients.
- E.** In the bedroom, minimize exposure to stuffed toys. Washable toys should be cleaned weekly in hot water and the mattress should be enclosed in a special cover.
- F.** In general, infants and young children consistently requiring symptomatic treatment more than two times per week should be given daily anti-inflammatory therapy.
- G.** Inhaled steroids are safe and the most effective long term controller medication in children with mild to moderate asthma. Children on chronic inhaled steroids should have their growth monitored for the slight, temporary reduction in growth rate that may be seen with this treatment.
- H.** Response to therapy should be carefully monitored. Once control of asthma symptoms is established and sustained, a careful step down in therapy should be attempted. If clear benefit is not observed, alternative therapies or diagnoses should be considered.

### Addendum:

The following new therapies may be considered for those asthmatics that have not responded to standard intensive treatment:

1. Biological agents: anti IGE Xolair sc.or,anti IL5,mepolizumab . For severe allergic asthma.
2. Long acting anti- cholinergic tiotropium (spiriva) inhaler.
3. Bronchial thermoplasty to reduce bronchial wall smooth muscle using heat generated by radio-frequency energy.
4. LABA/topical steroid once daily inhaler futasone furoate/villanterol,(Breo.)

Referances1, GINA Global Asthma Initiative ,Updated 2017 ginasthma.org  
2Journal Asthma Allergy 2015 8:39-49

- 
1. Adapted from, " National Asthma Education and Prevention Program Expert Panel Report (EPR3): Guidelines for the Diagnosis and Management of Asthma. Bethesda, Md.: National Heart, Lung, and Blood Institute; 2007. NIH Publication 08-4051. Revised in 2013-2014.
  2. FDA

Classifications/Stepwise Therapies:

- FIGURE 4-6: Classifying Asthma Severity and Initiating Treatment in Youths >12 Years of age and Adults:  
<http://www.ncbi.nlm.nih.gov/books/NBK7222/figure/A2213/?report=objectonly>
- FIGURE 4-1a: Stepwise Approach for Managing Asthma in Children 0-4 Years of Age:  
<http://www.ncbi.nlm.nih.gov/books/NBK7229/figure/A1916/?report=objectonly>
- FIGURE 4-1b: Stepwise Approach for Managing Asthma in Children 5-11 Years of Age:  
<http://www.ncbi.nlm.nih.gov/books/NBK7229/figure/A1933/?report=objectonly>