



## Complete Summary

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### GUIDELINE TITLE

Key clinical activities for quality asthma care: recommendations of the National Asthma Education and Prevention Program.

### BIBLIOGRAPHIC SOURCE(S)

Williams SG, Schmidt DK, Redd SC, Storms W. Key clinical activities for quality asthma care: recommendations of the National Asthma Education and Prevention Program. MMWR Recomm Rep 2003 Mar 28;52(RR-6):1-8. [19 references]  
[PubMed](#)

### GUIDELINE STATUS

This is the current release of the guideline.

## COMPLETE SUMMARY CONTENT

SCOPE  
METHODOLOGY - including Rating Scheme and Cost Analysis  
RECOMMENDATIONS  
EVIDENCE SUPPORTING THE RECOMMENDATIONS  
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IMPLEMENTATION OF THE GUIDELINE  
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT  
CATEGORIES  
IDENTIFYING INFORMATION AND AVAILABILITY  
DISCLAIMER

## SCOPE

### DISEASE/CONDITION(S)

Asthma

### GUIDELINE CATEGORY

Diagnosis  
Evaluation  
Management  
Treatment

### CLINICAL SPECIALTY

Family Practice  
Internal Medicine  
Nursing  
Pediatrics  
Preventive Medicine

## **INTENDED USERS**

Health Care Providers  
Health Plans  
Managed Care Organizations  
Physicians

## **GUIDELINE OBJECTIVE(S)**

- To improve the implementation of the National Asthma Education and Prevention Program (NAEPP) Expert Panel Reports
- To identify a core set of 10 key clinical activities and corresponding action steps essential for ensuring that health care delivered to patients with asthma emphasizes the prevention aspect of care and addresses the components of care recommended in the Expert Panel Reports
- To help employer health benefits managers and health-care planners make decisions regarding delivery of quality health care for persons with asthma, in order to reduce patient symptoms, prevent exacerbations, and subsequently reduce the overall national burden of illness and death from asthma

## **TARGET POPULATION**

Infants, children, and adults with asthma

## **INTERVENTIONS AND PRACTICES CONSIDERED**

### **Evaluation/Diagnosis**

1. Medical history and physical examination
2. Classification of severity of asthma through evaluation of clinical signs, symptoms, results of peak flow monitoring or spirometry, and evaluation of level of medication required to maintain treatment goals
3. Referral to a specialist for further evaluation as indicated

### **Management/Treatment**

1. Routine follow-up care, including clinical assessment of airway function over time (spirometry), evaluation of patient's medication use and management plan, self-monitoring records, assessment of patient's self-management skills
2. Measures to control asthma triggers, such as: evaluation of irritant or allergen sensitivity (symptom history, skin or blood testing); measures to prevent or treat comorbid conditions that exacerbate asthma symptoms (e.g. influenza vaccinations for prevention)

3. Education/instruction in self-management skills while considering cultural, ethnic beliefs and practices, and when possible involving family. Skills include:
  - Use of devices needed to administer medication or monitor their asthma (e.g., inhalers, spacers, nebulizers, and peak flow meters [PFMs])
  - Rationale behind medication regime
  - How to adjust dosages
  - How to avoid asthma triggers (e.g., use of dust mite impermeable pillow and mattress covers, removal of furry pets, elimination of cockroaches; avoidance of tobacco smoke)
4. Referral to an asthma specialist for consultation or comanagement as indicated
5. Pharmacotherapy
  - Inhaled corticosteroids
  - Other long-term medications (e.g., cromolyn, leukotriene modifiers, nedocromil, and theophylline)
  - Combination therapy: medication, such as short-acting bronchodilator medication and systemic (oral) corticosteroids, taken in combination with inhaled corticosteroids
6. Monitoring use of beta2-agonist drugs
7. Development and periodic review/adjustment of a written asthma management plan addressing factors, such as how to recognize symptoms and signs of worsening asthma; taking appropriate medicines (type, dose, and frequency); how to recognize when to seek medical care; how to monitor response to medications.

## **MAJOR OUTCOMES CONSIDERED**

Asthma-related morbidity and mortality

## **METHODOLOGY**

### **METHODS USED TO COLLECT/SELECT EVIDENCE**

Searches of Electronic Databases

### **DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE**

Not stated

### **NUMBER OF SOURCE DOCUMENTS**

Not stated

### **METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE**

Not stated

### **RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE**

Not applicable

#### **METHODS USED TO ANALYZE THE EVIDENCE**

Review

#### **DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE**

Not stated

#### **METHODS USED TO FORMULATE THE RECOMMENDATIONS**

Not stated

#### **RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS**

Not applicable

#### **COST ANALYSIS**

A formal cost analysis was not performed and published cost analyses were not reviewed.

#### **METHOD OF GUIDELINE VALIDATION**

Peer Review

#### **DESCRIPTION OF METHOD OF GUIDELINE VALIDATION**

Not stated

## **RECOMMENDATIONS**

### **MAJOR RECOMMENDATIONS**

#### **Essential Components of Care and Associated Key Clinical Activities**

The four essential components of asthma management--assessment and monitoring, controlling factors contributing to asthma severity, pharmacotherapy, and education for partnership in care--are distilled from the National Asthma Education and Prevention Program (NAEPP) *Expert Panel Report (EPR)-2 Guidelines for the Diagnosis and Management of Asthma* (refer to Table 1 in the original guideline document). In addition, 10 key clinical activities are described and listed, each according to the essential component it represents. Action steps are suggested to help accomplish each of the clinical activities. The intent of this report is to help employer health benefits managers and health-care planners make decisions regarding delivery of quality health care for persons with asthma.

#### **Assessment and Monitoring**

## **Key Clinical Activity 1. Establish Asthma Diagnosis**

After a person seeks medical care for symptoms that suggest asthma, the diagnosis of asthma should be clearly established and the baseline severity of the disease classified to help establish the recommended course of therapy. For symptomatic adults and children aged >5 years who can perform spirometry, asthma can be diagnosed after a medical history and physical examination documenting an episodic pattern of respiratory symptoms and from spirometry that indicates partially reversible airflow obstruction (>12% increase and 200 mL in forced expiratory volume in 1 second [FEV<sub>1</sub>] after inhaling a short-acting bronchodilator or receiving a short [2 to 3 week] course of oral corticosteroids).

Alternative diagnoses of symptoms that suggest asthma, including conditions affecting the upper and lower airways (e.g., upper airway obstruction/foreign body, bronchitis, pneumonia/bronchiolitis, chronic obstructive pulmonary disease, tumor/neoplasm, pulmonary embolism, congestive heart failure, vocal cord dysfunction, or viral lower respiratory tract infection) should be ruled out and may require additional tests. For the patient with a probable diagnosis of asthma after initial evaluation (i.e., symptomatic with normal spirometry and no alternative diagnosis), presumptive treatment may be necessary to reach a final diagnosis. Referral to a specialist (see Key Clinical Activity 4) may be necessary if the diagnosis is in doubt, other conditions are aggravating the asthma, or the contribution of occupational or environmental exposures needs to be confirmed.

For infants and children aged <5 years, the diagnostic steps are the same except that spirometry, the most objective measure of lung function, is not feasible for this age group. Therefore, young children with asthma symptoms should be treated as having suspected asthma once alternative diagnoses are ruled out. Their medical histories and physical examinations should be expanded to look for factors associated with the development of chronic persistent asthma: more than three episodes of wheezing in the past year that lasted more than 1 day and affected sleep, AND parental history of asthma or physician-diagnosed atopic dermatitis, or two of the following: physician-diagnosed allergic rhinitis, wheezing apart from colds, or peripheral blood eosinophilia. Over time, the diagnosis may become apparent or referral to a specialist may be necessary to perform additional testing to exclude other diagnoses.

Many children aged <6 years who wheeze with respiratory tract infections respond well to asthma therapy even though the diagnosis may be unconfirmed until persistence or recurrence of signs and symptoms is established. Approximately one third of children who wheeze with respiratory infections develop asthma that persists after age 6.

## **Key Clinical Activity 2. Classify Severity of Asthma**

Because asthma is characterized by varying signs and symptoms, for appropriate treatment and monitoring, the severity of such signs and symptoms must be classified at the initial and all subsequent visits. Initially and before treatment has been optimized, clinical signs, symptoms, and peak flow monitoring or spirometry are used to classify severity (refer to Table 2 in the original guideline document for classification of asthma severity) (Refer to Box 2 in the original guideline document for questions to ask in assessing patients with asthma). After the

patient's asthma is stable, severity is subsequently classified according to the level of medication required to maintain treatment goals (refer to Table 3 in the original guideline for a list of medications used in different levels of asthma severity).

Health-care providers should have the knowledge, equipment, staff or access to needed resources to aid in classification and proper management of all patients with asthma.

### **Key Clinical Activity 3. Schedule Routine Follow-Up Care**

Patients with asthma experience varying symptoms and severity because of the nature of asthma, their exposure to environmental allergens or irritants, or insufficient adherence to their medication regimen. For these reasons, they require adjustments in therapy and regular follow-up visits. The first follow-up visit should be scheduled within the month after initial diagnosis. Routine visits thereafter should be scheduled every 1-6 months, depending on the severity of asthma and the patient's ability to maintain control of symptoms.

Routine care includes clinical assessment of airway function over time. Spirometry is recommended at the initial assessment and at least every 1-2 years after treatment is initiated and the symptoms and peak expiratory flow have stabilized. Spirometry as a monitoring measure may be performed more frequently, if indicated, on the basis of severity of symptoms and the disease's lack of response to treatment.

At all follow-up visits, the physician reviews the patient's medication use and management plan, including self-monitoring records. Also at each visit, the physician should assess the patient's self-management skills, including correct technique for use of inhalers, spacers, and peak flow meters, as applicable. See Education for Partnership in Care (Key Clinical Activities 9 and 10) for more detailed discussion regarding the asthma management plan and patient self-management.

All patients should have access to and be instructed in the use of devices needed to administer medication or monitor their asthma (e.g., inhalers, spacers, nebulizers, and peak flow meters [PFMs]). Several devices may be required to ensure optimal treatment. Patients who use inhaled corticosteroids delivered by metered-dose inhalers should use a spacer to increase consistency of the dose and to minimize the possibility of local side effects. Some patients cannot easily coordinate actuation and inhalation using a metered-dose inhaler; spacers enable easier and more effective administration of medication. Spacers with face masks and nebulizers are both available for young children.

PFMs are recommended for patients with moderate or severe, persistent asthma and those with a history of severe exacerbations to help them monitor their symptoms during daily management as well as their response to home treatment during an exacerbation.

### **Key Clinical Activity 4. Assess for Referral to Specialty Care**

Referral to an asthma specialist for consultation or comanagement is recommended in the following circumstances:

- A single life-threatening asthma exacerbation occurs.
- Treatment goals for the patient's asthma are not being met after 3 weeks to 6 months of treatment, or earlier if the physician concludes that the asthma is not responding to current therapy.
- Atypical signs and symptoms make asthma diagnosis unclear, or other conditions are complicating asthma or its diagnosis.
- The patient has a history suggesting that asthma is being provoked by occupational factors, an environmental inhalant, or an ingested substance.
- The initial diagnosis is severe, persistent asthma.
- Additional diagnostic testing is indicated.
- The patient is a child aged <3 years with moderate or severe persistent asthma.
- The patient is a candidate for immunotherapy.
- The patient or family requires additional education or guidance in managing asthma complications or therapy, following the treatment plan, or avoiding asthma triggers.
- The patient requires continuous oral corticosteroid therapy or high-dose inhaled corticosteroids, or has required more than two courses of oral corticosteroids in 1 year.

Specialty care for asthma may be provided by an allergist, pulmonologist, or other physician with expertise in asthma management. Patients undergoing specialty care may be comanaged by the referring physician or monitored by the referring physician in accordance with the specialty care physician's treatment regimen.

### **Identifying and Controlling Factors Contributing to Asthma Severity**

#### **Key Clinical Activity 5. Recommend Measures to Control Asthma Triggers**

Environmental tobacco smoke (ETS) and house dust mite, cockroach, and cat and dog allergens can worsen asthma (or trigger asthma exacerbations) in sensitized and exposed persons. Irritant or allergen sensitivity can be determined by the patient's exposure and symptom history and confirmed with skin or blood testing. Allergy testing for perennial indoor allergens is recommended for persons with persistent asthma who are taking daily medications. After sensitivity is determined, avoidance of the trigger is recommended, and allergen abatement might be indicated. Ways to reduce allergen and irritant exposure should be reviewed and agreement sought with the patient to initiate measures. Examples of trigger avoidance include using dust mite impermeable pillow and mattress covers, removing furry pets, and taking measures to eliminate cockroaches (Refer to Box 3 in the original guideline for steps to reduce asthma triggers).

No patient with asthma should smoke or be exposed to ETS. Physicians should review smoking status at the initial visit and all subsequent visits and, if patients smoke or are regularly exposed to ETS, should encourage and refer them to stop smoking.

Exercise-induced bronchoconstriction describes the transient narrowing of airways associated with physical exertion in persons with asthma. Exercise-induced

bronchoconstriction may be prevented with optimal long-term control of asthma. If the patient remains symptomatic during exercise, specific medications can be taken before exercise to prevent exercise-induced bronchoconstriction.

### **Key Clinical Activity 6. Treat or Prevent All Comorbid Conditions**

Allergic rhinitis, sinusitis, gastroesophageal reflux, and sensitivity to certain medicines, including aspirin, nonsteroidal antiinflammatory drugs (NSAIDs), and beta blockers, can exacerbate asthma symptoms. Health-care providers should evaluate their asthma patients for these conditions and inquire about their medications, especially when asthma symptoms persist or worsen despite medication adjustments.

Health-care providers should provide annual influenza vaccinations to patients with persistent asthma to prevent a respiratory infection that can exacerbate asthma. However, patients who are clinically allergic to egg should not get the vaccine.

### **Pharmacotherapy**

### **Key Clinical Activity 7. Prescribe Medications According to Severity**

Current evidence indicates that daily long-term control medications are necessary to prevent exacerbations and chronic symptoms for all patients with persistent asthma, whether the persistent asthma is mild, moderate, or severe. Inhaled corticosteroids are preferred because they are the most effective antiinflammatory medication available for treating the underlying inflammation characteristic of persistent asthma. For patients with mild persistent asthma, other long-term medications--cromolyn, leukotriene modifiers, nedocromil, and theophylline--are available but have not been demonstrated to be as effective as inhaled corticosteroids. Patients with moderate or severe disease usually require additional medication combined with inhaled corticosteroids for daily long-term control. All patients with asthma require a short-acting bronchodilator medication for managing acute symptoms or exacerbations when they occur; severe exacerbations require the addition of systemic (oral) corticosteroids to treat the increased inflammation present (see *EPR-2* for additional information about managing exacerbations of asthma).

The dosage and type of medications are crucial because asthma treatment is adjusted according to the level of asthma severity. Once therapy goals are achieved, a gradual reduction in treatment should be carefully undertaken to identify the minimum dose required to maintain control (refer to Table 3 in the original guideline for a list of medications used in different levels of asthma severity).

On the basis of the severity of asthma in an individual patient, various medication delivery and monitoring devices may be necessary (see Key Clinical Activity 3 for discussion of spacers/holding chambers, nebulizers, and peak flow and symptom monitoring).

### **Key Clinical Activity 8. Monitor Use of Beta2-Agonist Drugs**

Patients whose need increases for short-acting inhaled beta2-agonist to control serious day and night symptoms probably have inadequately controlled asthma. Although patients may need short-acting inhaled beta2-agonist during upper respiratory viral infections and exercise-induced bronchoconstriction, using more than one canister of short-acting beta2-agonist drugs per month is usually considered above expected use. At every patient visit, the health-care provider should review beta2-agonist medication use, including the patient's understanding of the dosage instructions, inhaler technique, and reasons for increased use. For patients using more beta2-agonist drugs than expected, daily long-term control therapy should be increased as needed, either by initiating or increasing daily long-term control therapy (refer to Table 3 in the original guideline for a list of medications used in different levels of asthma severity).

### **Education for Partnership in Care**

#### **Key Clinical Activity 9. Develop a Written Asthma Management Plan**

As part of the overall management of patients with asthma, the health-care provider, in consultation with the patient or the parent or guardian of a child with asthma, should develop a written plan as part of educating patients regarding self management, especially for patients with moderate or severe persistent asthma and those with a history of severe exacerbation. The National Heart, Lung, and Blood Institute provides more specific advice on asthma management plans, emphasizing the provider/patient partnership (available at <http://www.nhlbi.nih.gov/health/public/lung/asthma/asthma.htm#plan>). Writing the management plan helps clarify expectations for treatment (refer to Box 4 in the original guideline document for goals for asthma therapy) and provides patients with an easy reference for remembering how to manage their asthma. The action plan should include written instructions on recognizing symptoms and signs of worsening asthma; taking appropriate medicines (type, dose, and frequency); recognizing when to seek medical care; and monitoring response to medications. Symptom-based plans may be equally effective as plans based on peak flow monitoring, although some patient preferences and circumstances (e.g., inability to recognize or report signs and symptoms of worsening asthma) may warrant a choice of peak flow monitoring. The management plan should be reviewed and adjusted, as needed, at every visit. For children, a copy of the plan should be given to each care giver and the child's school.

#### **Key Clinical Activity 10. Provide Routine Education on Patient Self-Management**

Asthma education is essential for successful management of the disease. Effective asthma education is developed in a patient-provider partnership, tailored to the individual patient's needs relative to cultural or ethnic beliefs and practices. At a minimum, competent asthma education enlists and encourages family support, includes instructions on self-management skills (refer to Box 5 in the original guideline document for a list of patient self-management skills), and is integrated with routine ongoing care. It is provided, either as group or individual patient programs, to all patients and parents/guardians of children who have had a diagnosis of asthma.

A patient's ability to take asthma medications is a necessary skill of self-management. Patients and parents/guardians of children with asthma need to know the rationale behind daily long-term and quick-relief medications, how to take medications correctly, and how to adjust the dosage if asthma symptoms occur.

Instructions and verification on the proper use of any medication delivery devices and PFMs (for patients with moderate or severe persistent asthma) should be provided at the initial and each subsequent visit. Instruction should include how to interpret peak flow results and take action according to the asthma management plan.

To help patients avoid or control environmental factors that worsen their asthma, education should focus first on identifying simple measures. Once the patient notices improved asthma control, more complicated or extensive measures can be undertaken. Including members of the family in these discussions may be helpful because implementing avoidance and control measures often affects all family members. This is especially true with ETS education.

### **CLINICAL ALGORITHM(S)**

None provided

## **EVIDENCE SUPPORTING THE RECOMMENDATIONS**

### **TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS**

The type of supporting evidence is not specifically stated for each recommendation.

## **BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS**

### **POTENTIAL BENEFITS**

Guideline implementation will help purchasers and planners of health care define the activities that are important to quality asthma care, particularly in reducing symptoms and preventing exacerbations, and subsequently reducing the overall national burden of illness and death from asthma.

### **POTENTIAL HARMS**

Not stated

## **QUALIFYING STATEMENTS**

### **QUALIFYING STATEMENTS**

- Although this report is based on information directed to clinicians; it is not intended to substitute for recommended clinical practices for caring for

- persons with asthma, nor is it intended to replace the clinical decision-making required to meet individual patient needs.
- The key clinical activities are not intended for acute or hospital management of patients with asthma but rather for the preventive aspects of managing asthma long term.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Living with Illness

### IOM DOMAIN

Effectiveness  
Patient-centeredness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Williams SG, Schmidt DK, Redd SC, Storms W. Key clinical activities for quality asthma care: recommendations of the National Asthma Education and Prevention Program. MMWR Recomm Rep 2003 Mar 28;52(RR-6):1-8. [19 references]  
[PubMed](#)

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

2003 Mar 28

### GUIDELINE DEVELOPER(S)

Centers for Disease Control and Prevention - Federal Government Agency [U.S.]  
National Asthma Education and Prevention Program - Federal Government Agency [U.S.]

### SOURCE(S) OF FUNDING

United States Government

## **GUIDELINE COMMITTEE**

National Asthma Education and Prevention Program (NAEPP), Professional and Patient/Public Education Subcommittee (October 2001)  
Document Development Working Group

## **COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE**

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*Co-Chairperson:* Barbara P. Yawn, M.D., American Academy of Family Physicians, Rochester, Minnesota

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## **Document Development Working Group**

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## **FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST**

Not stated

## **GUIDELINE STATUS**

This is the current release of the guideline.

## **GUIDELINE AVAILABILITY**

Electronic copies: Available from the Centers for Disease Control and Prevention (CDC) Web site:

- [HTML Format](#)
- [Portable Document Format \(PDF\)](#)

Print copies: Available from the Centers for Disease Control and Prevention, MMWR, Atlanta, GA 30333. Additional copies can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9325; (202) 783-3238.

## **AVAILABILITY OF COMPANION DOCUMENTS**

The following are available:

- Expert Panel Report 2: guidelines for the diagnosis and management of asthma. Bethesda (MD): U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Heart, Lung and Blood Institute; 1997 Jul. 146 p. Electronic copies available from the [National Heart, Lung, and Blood Institute \(NHLBI\) Web site](#).

Print copies available from NHLBI Information Center, P.O. Box 30105, Bethesda, MD 20824-0105; e-mail: [nhlbiic@dgsys.com](mailto:nhlbiic@dgsys.com).

- National Asthma Education and Prevention Program Expert Panel Report: guidelines for the diagnosis and management of asthma update on selected topics-2002. J Allergy Clin Immunol 2002 Nov;110(5 pt 2):S141-219.

## **PATIENT RESOURCES**

None available

## **NGC STATUS**

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