

Aligning Patient Care and Asthma Treatment Guidelines

Eric Cannon, PharmD

Abstract

This article describes how the National Asthma Education and Prevention Program Guidelines for the Diagnosis and Management of Asthma can be used in the clinical setting to improve a patient's everyday function and quality of life. Major recommendations are detailed and case studies provide a practical approach for patient management.

(*Am J Manag Care.* 2005;11:S416-S421)

In 2002, it was reported that 72 of 1000 Americans (20 million) had asthma. Children were most affected: 83 of 1000 children aged 17 years or younger (6 million) had asthma compared with 68 of 1000 adults aged 18 years or older (14 million).¹ Asthma attack prevalence (ie, the number of people who had at least 1 severe exacerbation within the past 12 months) is a simple indicator of how many people have uncontrolled asthma and are at risk for a negative clinical outcome, such as hospitalization or death. Data show that in 2002, 12 million people (60% of those with asthma at the time of the survey) suffered an asthma attack in the preceding year.

Despite the many medications available to treat asthma, the disease remains a crucial public health issue. In response to this health concern, the National Institutes of Health convened an expert panel that produced the National Asthma Education and Prevention Program (NAEPP) Expert Panel Report: Guidelines for the Diagnosis and Management of Asthma in 1991, with updates published in 1997 and 2002. These guidelines give clinicians a foundation on which to base the management of patients with asthma. The guidelines include the role of inflammation in the pathogenesis of asthma, the importance of monitoring asthma

via both the patient's symptoms and spirometry, recognition of the value of long-term controller medications, the significance of individualized written action plans, the role of patient education at each office visit, and the need to set appropriate treatment goals and to involve the patient in the goal-setting process.

Asthma is the third leading cause of preventable hospitalization in the United States.² According to the NAEPP, asthma care can be improved. Hospitalizations caused by asthma are preventable or avoidable when patients receive appropriate primary care. A prospective survey study of patients who visited an urban emergency department (ED) over a 1-year period for symptoms of wheezing showed that inhaled corticosteroids (ICSs) were used by only 16% of patients.³ The study also showed that more than one third of patients had made repeated visits to the ED within the 1-year period. These data underscore the fact that there is a subset of patients who not only have recurrent wheezing but also have difficulty managing their illness to avoid costly hospital services.

Because of these recurrent problems, the NAEPP has been heavily promoting its guidelines as a structured plan to manage disease. A 2005 published study of 3748 children with asthma in Hartford, Conn, assessed whether an organized, citywide asthma management program delivered by primary care physicians increased adherence to the guidelines, and whether guideline adherence led to decreased medical

Address correspondence to: Eric Cannon, PharmD, Director, Pharmacy Services and Health and Wellness, IHC Health Plans, 4646 West Lake Park Blvd, Salt Lake City, UT 84120; e-mail: eric.cannon@ihc.com

services.⁴ Of those children enrolled in the disease management program, 48% had persistent asthma. After the 4-year study was completed, the results showed that provider adherence to the guidelines for anti-inflammatory therapy, the mainstay of asthma management, rose from 38% to 96%. In turn, paid claims for ICSs increased by 25% ($P < .0001$). Children in the program experienced a 35% decrease in overall hospitalization rates ($P < .006$), a 27% decrease in ED visits for asthma exacerbations ($P < .01$), and a 19% decrease in outpatient visits ($P < .0001$). Thus, an organized guideline-based program designed to promote better living with asthma resulted in healthier children who had better-controlled disease.

What Are the Major Recommendations of the NAEPP Guidelines?

The guidelines include the following basic recommendations⁵:

1. Measures of assessment and monitoring
 - Diagnose asthma and draw up an action plan that actively involves the patient
2. Control of factors contributing to asthma severity
 - Reduce inflammation, symptoms, and exacerbations
3. Pharmacologic therapy
 - Monitor and manage asthma over time with pharmacotherapy
4. Patient education for a partnership in asthma care
 - Treat asthma episodes promptly

1. Measures of Assessment and Monitoring. Although there are no tests considered to be the "gold standard" for diagnosing asthma, one can be established if a history of airflow obstruction exists (eg, wheezing, chest tightness) and if the obstruction is at least partially reversible.⁵ The use of spirometry to perform pulmonary function tests is a valuable tool in evaluating a patient's degree of airway obstruction. However, other potential etiologies must be ruled out, such as the presence of foreign bodies and of other lung diseases, such as chronic obstructive pulmonary disease and gastroesophageal reflux disease. After a diagnosis,

the first step of treatment is to set up a written action plan for managing asthma that specifies treatment goals. These goals must be determined and agreed on by both the clinician and the patient. For example, the patient's goal may be to play sports without experiencing lung problems or to sleep through the night without having difficulty breathing. The clinician will educate the patient about allergen avoidance and medication use to help the patient realize the goals. A written action plan can provide guidance on treating the patient's asthma and is a document to which patients can refer as they become more involved in their therapy.

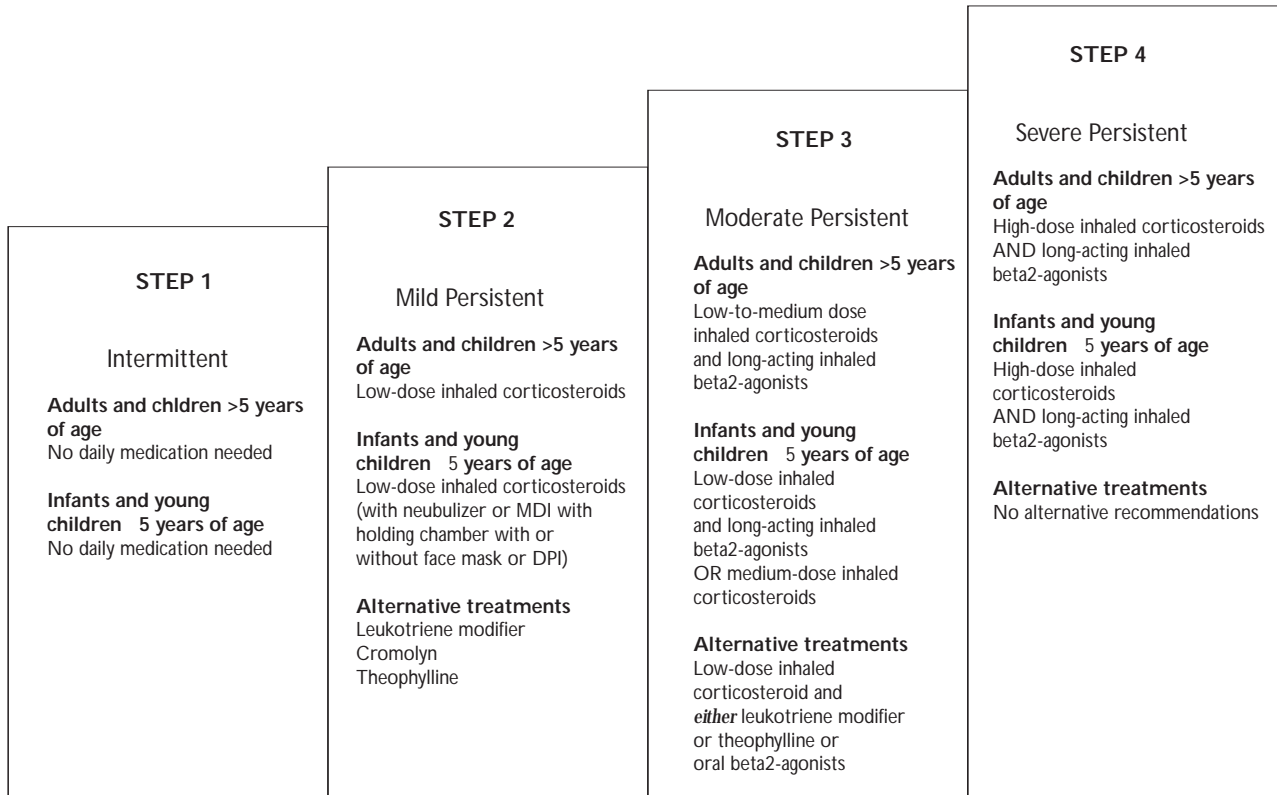
2. Control of Factors Contributing to Asthma Severity. The NAEPP guidelines state that anti-inflammatory medications should be prescribed to all patients with mild, moderate, or severe persistent asthma.⁵ As mentioned earlier, the ICSs are the most potent inhaled anti-inflammatory medications currently available to manage persistent asthma.⁵ Identifying allergens and irritants that can trigger exacerbations and advising patients to avoid them can also help reduce asthma symptoms.⁵ Written and verbal instructions should be provided to the patient on how to avoid or reduce factors that can trigger or exacerbate breathing problems.

3. Pharmacologic Therapy. It is important that patients take an active role in managing their asthma. The clinician should teach the patient how to monitor symptoms (eg, to be aware if nighttime symptoms are increasing or if wheezing is on the rise). Patients with moderate-to-severe persistent asthma should learn to monitor their peak flow.⁵

Depending on the level of symptom control, patients should visit their physician at least every 1 to 6 months to assess treatment goals, address any concerns about medications or lifestyle modifications, review the action plan, and check inhaler and peak flow techniques.

4. Patient Education for a Partnership in Asthma Care. Effective control of an asthma exacerbation begins with an immediate response to the onset of episodic symptoms.

Figure 1. The Stepwise Approach to Asthma Therapy



MDI indicates metered-dose inhaler; DPI, dry powder inhaler.
Source: Reference 6.

A short-acting, beta2-agonist should be immediately administered in most cases of asthma, whereas an oral steroid for 3 to 10 days is more appropriate in cases of severe asthma exacerbations. Equally important is prompt and consistent communication between the patient and physician.⁵

The Stepwise Approach to Therapy

The NAEPP guidelines stress the importance of stepwise therapy, which is increasing the dosage and number of medications as necessary to maintain control of asthma, and decreasing them when possible.⁶ The stepwise approach to therapy is summarized in Figure 1. The approach to stepwise therapy is as follows and includes a number of key objectives⁶:

- Asthma severity dictates the amount and frequency of medication
- There are 2 acceptable approaches to treatment

1. Start medication at a level higher than the patient's onset severity level to establish prompt control; it should then be stepped down to the minimum medication necessary to control symptoms.
 2. Start medication at the level appropriate for the severity of the patient's symptoms; increase dosage as needed.
- Patients should be monitored continually to ensure adequate control

The next 2 case studies illustrate the stepwise approach to managing patients with asthma.

Case Study: Patient 1.⁷

- Male, aged 4 years
- Presently at Step 2 (mild persistent asthma)
 - Symptoms >2 times/week, but <1 time/day; >2 nights/month

- Preferred treatment:
 - Low-dose ICS (with nebulizer or metered-dose inhaler [MDI] with holding chamber with or without face mask, or dry powder inhaler)
- Alternative treatments (listed alphabetically):
 - Cromolyn (nebulizer is preferred or MDI with holding chamber)
 - OR
 - Leukotriene modifier

This patient is currently experiencing worsening symptoms and has been classified as Step 3 (moderate persistent asthma). Symptoms are now daily, with more than 1 night per week. The preferred treatment is a low-dose ICS plus a long-acting inhaled beta2-agonist, or a medium-dose ICS alone. An alternative treatment would be a low-dose ICS plus either a leukotriene modifier or theophylline.

Case Study: Patient 2.⁷

- Female, aged 21 years
- Presently at Step 2 (mild persistent asthma)
 - Symptoms >2 times/week but <1 time/day; >2 nights/month; peak expiratory flow variability >30%
- Preferred treatment:
 - Low-dose ICS
- Alternative treatments (listed alphabetically):
 - Cromolyn or nedocromil
 - Leukotriene modifier
 - Sustained-release theophylline (serum concentration 5-15 µg/mL)

This patient is now experiencing a remission in her symptoms and is in Step 1 (mild intermittent asthma). Her symptoms now occur 2 days per week or less and 2 nights per month or less. The preferred treatment for this patient is no daily medication.⁶ Because severe exacerbations may occur periodically, it is recommended that the patient be supplied with a prescription for a course of oral corticosteroids. For quick relief, she should use an inhaled, short-acting beta2-agonist as needed for symptoms. The

patient should be monitored for increased use of the inhaler (>2 times/week), because this is generally a sign of exacerbation.

The 2002 Guidelines Update

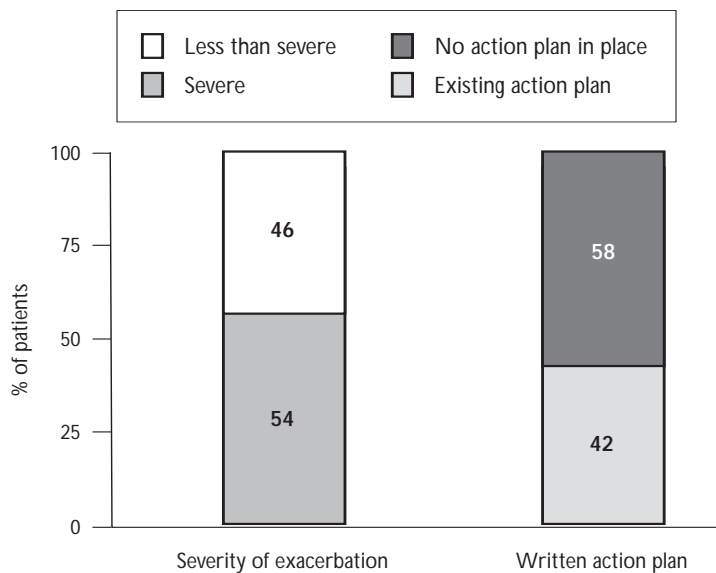
The most recent (2002) update of the NAEPP guidelines focuses on medications (long-term management of asthma in children; combination therapy and antibiotic use), monitoring (written action plans compared with medical management alone; symptom-based vs peak flow-based action plans), and prevention (effects of early treatment on asthma progression).

The guidelines suggest that long-term management of asthma in children can be enhanced with use of ICSs.⁸ Clinical trials in children provide strong evidence that ICSs, when taken as needed, improve asthma control compared with beta2-agonists, as well as limited evidence when compared with cromolyn, nedocromil, theophylline, and leukotriene modifiers. Furthermore, therapy should be initiated in infants and young children if more than 3 episodes of wheezing have occurred in the past year lasting more than 1 day and affecting sleep, especially if risk factors exist (eg, family history of asthma, allergic rhinitis, atopic dermatitis). Long-term therapy should also be started if symptomatic treatment is needed more than twice per week or severe exacerbations are less than 6 weeks apart.⁸

The use of antibiotics in combination with standard care for asthma exacerbations has been questioned. Clinical trials show no benefit from routine antibiotic therapy for asthma exacerbations. According to the 2002 NAEPP guidelines update: "Antibiotics are not recommended for the treatment of acute asthma exacerbations, except as needed for comorbid conditions (eg, for those patients with fever and purulent sputum, evidence of pneumonia, or suspected bacterial sinusitis)."⁸

A written action plan can be an integral part of improving patient outcomes. A review of 25 studies showed that the self-management interventions associated with written action plans reduced ED visits, decreased hospitalizations, and improved lung function (Figure 2).⁹ Only 42% of patients had written action plans for self-

Figure 2. The Need for a Written Asthma Plan



Of 219 patients experiencing exacerbation of asthma, 54% of exacerbations were severe, and less than half of all patients had a written action plan in place. Source: Adapted with permission from Guittet L, et al. *Br J Gen Pract.* 2004;54:759-764.

management of asthma exacerbations. According to the 2002 NAEPP guidelines update: “The use of written action plans as part of an overall effort to educate patients in self-management is recommended, especially for patients with moderate or severe persistent asthma and patients with a history of severe exacerbations.”⁷

Patient monitoring is also crucial for improving patient outcomes, whether it is peak flow-based or symptom-based.⁸ Evidence is not sufficiently strong to mandate either type of action plan for improving symptoms or lung function. Patient preferences and circumstances (eg, the inability to recognize or report signs and symptoms of worsening asthma) may warrant choosing peak flow monitoring. The 2002 NAEPP guidelines update states that peak flow monitoring in patients with moderate or severe persistent asthma can “enhance clinician-patient communication and may increase patient and caregiver awareness of the disease status and control.”⁷

Asthma and Pregnancy

In 2005, the NAEPP issued updated asthma treatment guidelines for use during preg-

nancy.¹⁰ The report recognized that inadequate asthma control poses a risk to both mother and fetus. Because most asthma medications are safe to use during pregnancy, it is safer to use asthma medications than to suffer asthmatic symptoms and exacerbations. Also, obstetric care providers should be included in the patient’s asthma management team so the patient’s asthma care plan can be adjusted as needed to ensure a healthier pregnancy.

Summary

The NAEPP guidelines suggest a systematic course of action to best manage asthma patients based on expert opinion while using the most current information available. The guidelines cover all aspects of asthma management from diagnosis and medication use, to environmental issues and monitoring. Using these guidelines in the practice setting can potentially make the difference between a patient who is functionally limited to one who is active and enjoying a good quality of life.

REFERENCES

1. Centers for Disease Control and Prevention. Asthma prevalence, health care use and mortality, 2002. Available at: <http://www.cdc.gov/nchs/data/asthmahealthstat1.pdf>. Accessed May 30, 2005.
2. Kowalski AF. Reducing asthma morbidity and mortality. Cost containment strategies. *AAOHN J.* 2000;48:418-422.
3. Friday GA Jr, Khine H, Lin MS, Caliguiri LA. Profile of children requiring emergency treatment for asthma. *Ann Allergy Asthma Immunol.* 1997;78:221-224.
4. Cloutier MM, Hall CB, Wakefield DB, Bailit H. Use of asthma guidelines by primary care providers to reduce hospitalizations and emergency department visits in poor, minority, urban children. *J Pediatr.* 2005;146:591-597.
5. National Heart, Lung, and Blood Institute. National Asthma Education and Prevention Program (NAEPP), Expert Panel Report 2: Practical Guide for the Diagnosis and Management of Asthma. National Institutes of Health Publication 97-4053. Bethesda, Md: US Department of Health and Human Services; 1997.
6. National Heart, Lung, and Blood Institute. National Asthma Education and Prevention Program (NAEPP), Expert Panel Report 2: Guidelines for the Diagnosis and Management of Asthma—Clinical Practice Guidelines. National Institutes of Health Publication 97-4051. Bethesda, Md: US Department of Health and Human Services; 1997.
7. National Heart, Lung, and Blood Institute. National Asthma Education and Prevention Program (NAEPP), Expert Panel Report: Guidelines for the Diagnosis and Management of Asthma—Update on Selected Topics

2002. National Institutes of Health Publication 02-5074. Bethesda, Md: US Department of Health and Human Services; 2003.

8. National Heart, Lung, and Blood Institute. National Asthma Education and Prevention Program (NAEPP), Quick Reference: NAEPP Expert Panel Report: Guidelines for the Diagnosis and Management of Asthma—Update on Selected Topics 2002. National Institutes of Health Publication 02-5075. Bethesda, Md: US Department of Health and Human Services; 2002.

9. Guittet L, Blaisdell CJ, Just J, Rosencher L, Valleron AJ, Flahault A. Management of acute asthma exacerbations by general practitioners: a cross-sectional observational survey. *Br J Gen Pract.* 2004;54:759-764.

10. National Heart, Lung, and Blood Institute; National Asthma Education and Prevention Program Asthma and Pregnancy Working Group. NAEPP expert panel report. Managing asthma during pregnancy: recommendations for pharmacologic treatment—2004 update. *J Allergy Clin Immunol.* 2005;115:34-46.