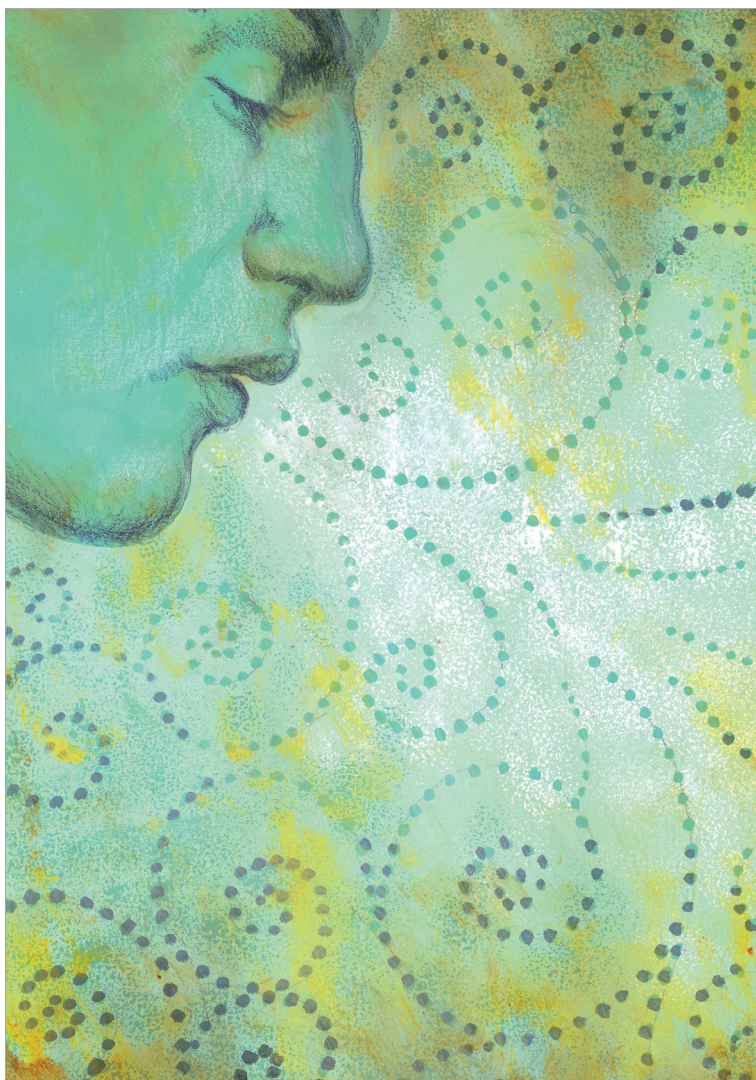


# Rethinking asthma education: A practical approach to improve treatment outcomes

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## ABSTRACT

Many asthma-related hospitalizations are preventable with appropriate access to care as well as adherence to lifestyle modifications and medical treatment, yet as many as half of all patients with asthma fail to adhere to treatment as prescribed. Identifying the specific barriers affecting a patient and engaging with the patient in active planning to overcome adherence barriers is a practical strategy for achieving and sustaining adherence to long-term therapy.

**Keywords:** asthma, asthma education, asthma hospitalization, barriers to treatment, nonadherence

## Learning objectives

- Describe the economic and social impact of asthma in the United States
- Recognize five sets of factors that determine adherence to prescribed therapies for asthma
- Discuss practical strategies PAs can employ to overcome adherence barriers for patients with asthma
- Integrate patient education strategies that foster self-management into care for adults with asthma

Asthma affects approximately 8.2% of the US population, according to data from 2011.<sup>1</sup> Asthma prevalence grew from 11.4% in 2001 to 12.9% in 2011, according to the CDC.<sup>2</sup> The financial burden of asthma in the United States is \$56 billion annually.<sup>1</sup> US surveillance data from 2007 reports asthma was responsible for 1.75 million emergency department visits, 456,000 hospitalizations, and nearly 3,500 deaths.<sup>3</sup> Despite the availability of highly effective treatments, failure to control chronic asthma symptoms and to reduce the frequency and severity of acute exacerbations are the predominant drivers behind these hospitalizations.<sup>3</sup> Many asthma-related hospitalizations are preventable with appropriate access to care as well as adherence to lifestyle modifications and medical treatment, yet as many as half of all patients with asthma fail to adhere to treatment.<sup>4</sup> Nearly 75% of the total costs associated with asthma may be due to poor asthma control, and improved patient adherence is fundamentally important to better asthma control and health-related quality of life.<sup>5</sup>

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### Key points

- As many as half of all patients with asthma fail to adhere to treatment as prescribed, which can lead to preventable hospitalizations.
- Identifying the barriers affecting a patient and engaging the patient in planning to overcome those barriers can improve adherence to long-term therapy.
- Often, patients do not understand their medications, and have fears about adverse effects, for example of inhaled corticosteroids.
- Patients must understand that asthma is chronic and incurable, and a lack of symptoms does not mean “no asthma.”
- Letting patients select a product or device that appeals to their personal preferences, daily lifestyle, and financial resources can improve therapy adherence.

### BARRIERS TO EFFECTIVE TREATMENT

Failure to adhere to prescribed asthma management plans is a widespread problem with multiple causes, both patient- and provider-related.<sup>6-8</sup> Provider-related issues may involve the health care team and the health care system.

Patients may experience difficulty using an inhaler or nebulizer, struggle to understand complex regimens, experience treatment-limiting adverse reactions, face challenges affording costly prescription medications or devices, or lack appreciation for the value of maintenance therapies and preventive strategies. Nonadherence to prescribed therapies is also attributable to poor instructions for use, distrust between patient and prescriber, patient fears or concerns that are inadequately addressed prior to prescribing, poor supervision or monitoring, the patient's or provider's lack of understanding the severity of the asthma symptoms, and other patient-specific factors such as sociocultural issues, forgetfulness, or poor motivation.<sup>9</sup> Although often interconnected, patient and provider barriers will be further explored categorically for the ease of discussion.

### PATIENT BARRIERS TO ADHERENCE

Adherence to a prescribed therapy is a dynamic, complex phenomenon, especially when the therapy requires long-term use. The World Health Organization's (WHO) adherence project adapted its definition of adherence to long-term therapy from definitions by Haynes and Rand: the extent to which a person's behavior—taking medication, following a diet, and/or executing lifestyle changes—corresponds with agreed recommendations from a health care provider.<sup>10,11</sup>

Adherence is determined by the interaction of five sets of factors or “dimensions”: patient-specific factors, health care team and health system factors, therapy-related factors, condition-related factors, and socioeconomic factors. It is a common misconception among prescribers that patients are solely responsible for using medication as prescribed.

This belief is often accompanied by a misunderstanding of how other factors may influence a patient's capacity to adhere to a prescribed treatment.<sup>12</sup>

Patient-related factors encompass the resources, knowledge, attitudes, beliefs, perceptions, and expectations of the patient. Critical factors include patients' knowledge and beliefs about their asthma, their level of motivation to manage it, self-efficacy or confidence to provide self-care, and their expectations about treatment outcomes including potential consequences of poor adherence.

Trust and partnership between the prescriber and the patient are necessary to overcome barriers to adherence. Identifying the specific barriers impacting a patient and then engaging in active planning with the patient to overcome adherence barriers is a practical strategy to achieve and sustain adherence to long-term therapy.

### PATIENT MISCONCEPTIONS, FEARS, AND SUSPICIONS ABOUT MEDICATIONS

Bender and colleagues' review of 32 studies on patient perceptions and attitudes toward asthma treatment identified numerous barriers to treatment adherence among children and adults (Tables 1, 2, and 3). One common barrier affecting all of the studied groups was that the patients did not understand the asthma medications they were prescribed. Fear of adverse effects from the treatments was also a central concern for all groups.<sup>13</sup> Worries about the adverse effects of inhaled corticosteroid therapy nearly halved the odds of adherence in one study.<sup>14</sup> Practical barriers, such as time commitment and financial concerns, were also common.

### PATIENT MISCONCEPTIONS OF ASTHMA

How patients feel about their asthma strongly influences treatment adherence and may be the most accurate predictor of adherence.<sup>8</sup> Halm and colleagues studied the idea that suboptimal beliefs about the chronicity of asthma may perpetuate poor asthma control in inner city patients, coining the phrase, “no symptoms, no asthma.” Of the 198 patients interviewed, over half believed that they had asthma only while having an asthmatic episode, demonstrating a fundamentally flawed understanding. The “no symptoms, no asthma” belief was strongly associated with lower rates of self-reported adherence to inhaled corticosteroid use, as well as increased routine visits to medical providers and decreased use of peak flow meters.<sup>15</sup> Further illustrating the role of perception in nonadherence to asthma treatment, Ponieman and colleagues showed that simply telling patients that it is important to use inhaled corticosteroids even when they are asymptomatic nearly quadruples the odds of adherence.<sup>9</sup>

### UNDERSTANDING “ASTHMA CONTROL”

The way patients and prescribers define “asthma control” may differ, which can negatively influence treatment adherence. Numerous tools can be used to gauge the level

**TABLE 1. Patient-identified barriers to asthma adherence (adults)**

|                                                 |
|-------------------------------------------------|
| Cost of medication                              |
| Dislike of provider                             |
| Fear of adverse events of medication            |
| Inconvenience of medication use                 |
| Sense of only intermittent need for medications |
| Suspicion of effectiveness of medications       |

**TABLE 2. Patient-identified barriers to asthma adherence (children and parents)**

|                                                                     |
|---------------------------------------------------------------------|
| Difficulty with administration of medication                        |
| Dividing responsibility for treatment among children and caregivers |
| Fear of addiction/dependence                                        |
| Fear of adverse effects of medications                              |
| Stigmatization                                                      |

**TABLE 3. Patient-identified barriers to asthma adherence (low-income patients)**

|                                         |
|-----------------------------------------|
| Difficulty/cost in obtaining medication |
| Distrust of medical establishments      |
| Fear of adverse events of medication    |
| Interference of life hassles            |

of control of asthma (Table 4), including well-accepted criteria within the Global Initiative for Asthma's (GINA) guidelines. GINA criteria define "controlled asthma" as no daytime/nocturnal symptoms, no limitations of activity, no need for rescue treatment, normal lung function ( $>80\%$  predicted  $FEV_1$  or peak flow), and no exacerbations.<sup>16</sup> In the European Asthma Insights and Reality in Europe (AIRE) study, 50% of patients reported that they considered their asthma to be completely or well-controlled, but only 5.1% of adults and 5.8% of children met the GINA criteria for asthma control.<sup>17</sup>

With the range of asthma treatments now available, a patient with asthma may be able to live without asthma symptoms. Many patients do not realize that this level of control is feasible or could be a personal goal. Engaging patients to assess how they view their asthma, building consensus between patient and prescriber for defining asthma control, and ensuring that asthma education is efficient and patient-centered are practical strategies to overcome adherence barriers.

### PROVIDER DEFICIENCIES IN ASTHMA EDUCATION

PAs are fortunate to have access to a plethora of asthma education resources. The practical application of educating patients about their asthma and treatment is complicated by the complexity of diagnosis, staging, multidimensional treatment plans, and long-term commitment to asthma management. The literature reveals a disconnect between providers' perception of what they are offering and patient

reports of what they are receiving in terms of patient education.<sup>18</sup>

### DO PROVIDERS UNDERSTAND THE STANDARD OF CARE?

Accurately classifying asthma severity and pairing it with the proper level of therapy and developmental stage can be a complex, time-intensive task. Evidence-based guidelines such as those from the 2007 National Asthma Education and Prevention Program (EPR-3)<sup>19</sup> are accessible to PAs, but can require considerable effort to apply effectively. The value of such guidelines include resources and strategies to encourage self-monitoring, develop written asthma plans, instruct patients on proper administration techniques for medications, increase awareness and avoidance of environmental factors, and promote a team approach to care. Using the self-assessment and educational tools provided in the EPR-3, including teaching patients to describe their symptom severity in the same measurable terms used in the guidelines, is a practical strategy to overcome barriers to adherence. Individualizing care for a patient while using the standardized EPR-3 tools for symptom surveillance and reinforcement of critical elements of asthma education can be both patient-centered and efficient. Active engagement with evidence-based practice guidelines can also promote prescribing practices that are consistent with best practice. Individualizing therapy and discussing the rationale for any alternative therapies before prescribing can support treatment adherence.

Several studies have shown that, despite familiarity with the National Heart, Lung, and Blood Institute (NHLBI) guidelines, many providers do not adhere to them for certain elements of asthma diagnosis and treatment.<sup>19</sup> Cabana and colleagues investigated barriers for each individual aspect of the 1997 NHLBI guidelines and found that lack of time, lack of educational materials, lack of support staff, and lack of reimbursement were barriers to effective implementation of key components of the guidelines, such as prescribing corticosteroid medications, teaching patients how to use peak flow meters, and counseling patients or caregivers about tobacco cessation.

Inconsistent provider practices with clinical practice guidelines have been described as a significant barrier to treatment adherence.<sup>20</sup> Wisnivesky and colleagues also found that lack of outcome expectancy and poor provider self-efficacy were barriers to following the guidelines.<sup>21</sup> PAs who are not confident in their ability to effectively implement best practices using practice guidelines can negatively influence quality of care.

A practical strategy for improving provider self-efficacy and overcoming negative outcome expectancy can involve leveraging the unique relationship with a supervising physician. Identifying how a physician supervisor incorporates practice guideline recommendations into diagnosis, classification, treatment, monitoring, and patient education and

**TABLE 4. Guidelines and resources****Guidelines for the Diagnosis and Management of Asthma (EPR-3)**[www.nhlbi.nih.gov/guidelines/asthma](http://www.nhlbi.nih.gov/guidelines/asthma)**Global Initiative for Asthma (GINA)**[www.ginasthma.org](http://www.ginasthma.org)**Examples of written asthma action plans**[www.cdc.gov/asthma/actionplan.html](http://www.cdc.gov/asthma/actionplan.html)[www.nationalasthma.org.au/managing-asthma/controlling-your-asthma/written-asthma-action-plans](http://www.nationalasthma.org.au/managing-asthma/controlling-your-asthma/written-asthma-action-plans)[img.webmd.com/dtmcms/live/webmd/consumer\\_assets/site\\_images/media/pdf/hw/form\\_zd1600.pdf](http://img.webmd.com/dtmcms/live/webmd/consumer_assets/site_images/media/pdf/hw/form_zd1600.pdf)

then modeling these behaviors is an option. Additionally, team members can meet to discuss clinical practice recommendations and then distribute responsibility for key elements within a comprehensive asthma management plan. Distribution of responsibility would ideally be based on each individual team member's personal strengths and clinical expertise.

### LEVELING THE PLAYING FIELD

Many patients report that even after receiving asthma education, they are still not clear on their role and the purpose of different treatment modalities in self-management. These observations highlight the need to assess the patient's understanding after an educational intervention, such as through a "teach back" method. Prescribers may relay early on to patients that self-management of asthma can seem complicated and that feeling overwhelmed is a normal response. Prescribers may engage patients with diagrams or visual aids to explain the "step-up" and "step-down" approach to asthma treatment and then provide copies or reference online educational resources for reinforcement. It may also be helpful to tell patients that a variety of orally administered and inhaled therapies can be used to control asthma symptoms and that some are delivered through devices that are not always intuitive to use. Prescribers will support treatment adherence if subsequent decision making involves individualizing prescribed therapies with active patient involvement. Providing opportunities for patients to help select a product or device that appeals to their personal preferences, daily lifestyle, and financial resources is key.<sup>22</sup> The use of a practical model that guides proper prescribing and helps the provider organize the discussion of potential treatments is an efficient strategy to minimize barriers to adherence.

Patients' lack of knowledge of the basic mechanisms and pathophysiology of asthma has been identified as a causative factor in poor adherence as well as a common area of weakness in available asthma education resources.<sup>7,23</sup> All patients should understand certain essential features of asthma: that it is a chronic illness without a cure, that it can be fatal, and it is characterized by both reversible airway obstruction and chronic inflammation. Inadequate understanding of these essential features predicts worse

clinical outcomes.<sup>19</sup> Patients who believe their asthma can be cured or that the disease process is intermittent rather than chronic are more likely to use asthma controller medications inconsistently.<sup>19</sup> More than half of patients with mild asthma do not know that asthma attacks can be fatal.<sup>21</sup> Poor health literacy is associated with worse clinical outcomes and is another barrier to adherence.<sup>19</sup>

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Asthma control is complicated  
by demographic diversity  
among patients, but mindful  
providers can level the  
playing field across their own  
patient population.

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### REACHING COMMON GROUND

Patient education begins with sharing basic knowledge about asthma, but it should evolve. Asthma education should be perceptually vivid and presented in a way that not only conveys factual information but also transcends patients' pre-existing beliefs about their disease.<sup>19</sup> Asthma education should be adaptable and personalized with a focus on improving self-management and clinical outcomes. Physician assistants can assess individual patients' perceptions of their asthma, how they control it, what their limitations are, what areas of self-management are confusing, and how and when they use different treatment modalities. Establishing a partnership with the patient and collaborating with other members of the health care team and the patient's support system are practical strategies to overcome common barriers to adherence. A skillful PA will uncover each patient's beliefs about asthma and then, within that context, begin the process of identifying and addressing specific deficiencies in knowledge and barriers to adherence.<sup>7</sup>

## REACHING THE INDIVIDUAL

Educational programs focused on self-management of asthma in children and adolescents have been shown to improve clinical outcomes and quality of life. Benefits demonstrated with individualized asthma education programs include improved lung function, feelings of self-control, fewer days missed from school or work, fewer days with restricted activity, fewer ED visits, and less disturbed sleep. The literature reveals that an individualized approach to asthma education is critically important to improving outcomes. Thus, although the physician assistant may use standardized educational resources, implementing patient education effectively necessitates a patient-centered approach with active engagement of the patient. Barriers to self-care are recognized and systematically overcome with instruction, encouragement, or support.

## BEING MINDFUL

Although health literacy, language barriers, or socioeconomic diversity may be perceived as major barriers to asthma control, these factors have been shown to be surmountable. The single most important barrier to asthma control is lack of adequate and appropriate patient education.<sup>24</sup> In fact, when patients with poorer health literacy were given modest but appropriate education about asthma and the proper use of metered-dose inhalers, their outcomes were similar to those for patients with higher baseline health literacy scores.<sup>25,26</sup>

Provider self-awareness is essential. PAs should understand how their view of patients with asthma changes according to a patient's demographic group. Global control of asthma is undeniably complicated by demographic diversity among patients with the disease. Still, mindful providers can level the playing field across their own patient population.

After an appropriate patient-specific framework has been established through partnership, education, and modification of asthma-specific beliefs, providers should then encourage active self-assessment and feedback from patients. PAs may find it necessary to adjust a plan or correct misconceptions at this stage to promote treatment adherence.<sup>7</sup> Following the development of patient-provider consensus on a management plan, patient education should emphasize daily management of asthma and how to recognize and treat worsening asthma. In a 2008 study, 96% of patients reported receiving instruction on proper inhaler use. In this same study, however, only 34% of patients reported receiving an asthma action plan with instructions on how to adjust medications based on symptoms, when to call their provider, or when to seek emergency care.<sup>4</sup> Prescribers believe they spend more time educating patients than patients do. Complex management plans are inherently more difficult for patients to follow without effective education and ongoing reinforcement. Rather than trying to increase time spent educating patients, PAs

**TABLE 5. Example questions for *Asthma Time Out***

The first step in this process involves asking questions about your patient's perceptions to guide your asthma education in addition to giving a written asthma plan.

- **Make sure the patient understands the chronic nature of asthma.**
  - Do you think that your albuterol inhaler “cures” your asthma?
  - When you aren't wheezing or having an attack, do you still have asthma?
- **Address the chronicity of asthma.**
  - How often does your asthma affect you?
- **Ask patients what they think asthma is?**
  - What is happening to you when you have an asthma attack?
- **Discuss long-term effects of uncontrolled asthma.**
  - What do you think will happen if you keep having uncontrolled asthma attacks?
- **Discuss the severity of asthma.**
  - How dangerous do you think asthma is?
- **Inquire about patients' perceptions of inhaled corticosteroids.**
  - What do you think about the medications we have talked about?
  - What do you think each of these drugs does?
- **Inquire about patient's ability to pay for medications.**
  - Do you anticipate having any trouble filling these prescriptions?

might instead regularly assess the effectiveness of education and the level of patients' knowledge through “teach back” methods or other means.

## SHIFTING PATIENT APPROACH

Although current asthma education efforts appear to be flawed, some form of asthma education is clearly a fundamental requirement for the proper control of symptoms.<sup>27</sup> The EPR-3 guidelines emphasize patient self-monitoring, written asthma plans, proper administration technique, and awareness/avoidance of environmental triggers. Research demonstrates, however, that individualizing clinical practice recommendations for patients is essential to improving clinical outcomes and quality of life.

An emphasis on quality and efficacy of asthma control requires a paradigm shift in the way PAs approach patients with asthma. Recognizing that self-management is frequently poor is the first step. Appreciating that self-management and asthma control can be considerably improved with proper education and evidence-based clinical decision making is the critical next step. The authors call for an Asthma Time-Out, in which providers work to develop clinic- or system-wide attitudes and protocols for

individualized asthma care and make asthma education a priority for the provider as well as the patient (Table 5). This education also needs to focus on the basic mechanisms and chronicity of asthma and, most importantly, to address the gaps in an individual patient's knowledge about his or her asthma condition. This involves asking key questions to determine what patients understand and where they are misinformed. While this disease poses unique challenges to education and self-management, research demonstrates that clearly communicated and individualized self-management plans can have the biggest effect on the morbidity, mortality, and financial burden of this disease. **JAAPA**

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