Strengthening Asthma Education to Enhance Disease Control*

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This article focuses on reducing the barriers to effectively applying what is known about asthma patient education. One barrier to effective asthma control in individuals and populations is failure to recognize the range of influences on patients trying to manage their disease, including actions of family, clinicians, friends and neighbors, work or school mates, and significant people and organizations in the wider social environment. Another deterrent is failing to assist patients in developing their self-regulation skills. Other barriers are the lack of attention to the patients' asthma management goals (as opposed to clinical objectives) and overlooking signs that indicate follow-up education is needed. Five actions taken by health-care professionals could significantly enhance the effectiveness of asthma education: (1) make messages to patients and core skills taught consistent with national asthma guidelines; (2) focus on developing the patient's ability to self-regulate; (3) develop comprehensive plans for treatment and education that assign clinicians to appropriate educative roles; (4) use clinician communication techniques demonstrated to enhance asthma management by patients; and (5) ensure that all providers of education are themselves trained to achieve actions 1 to 4.

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The Circles of Influence on Patients Managing Asthma

As asthma is a condition that cannot be prevented or cured, the aim of everyone must be to control its effect on a patient's health status and functioning, to curtail its disruptive impact on family life, and to reduce the health-care and other costs associated with it. We have found that one way to understand the range of influences on effective asthma control is to envisage concentric circles revolving around the patient (Fig 1). Each ring of the concentric circles represents people, organizations, programs, and policies instrumental to the success of the patient's asthma management efforts. Extensive experience suggests the important role of these circles of influence, and some research has demonstrated the relationship between them and beneficial outcomes (eg, fewer active symptoms, less health-care use, etc.).

At the center of the circles is the patient. The dominant role of the patient in control of his or her asthma is not disputed. A large number of controlled trials and a systematic review have provided clear evidence of the positive effect of educational and behavioral interventions on patients' disease manage-
ment behavior, hospitalizations, emergency department visits, unscheduled visits to the doctor, and days off from work or school.

Closest to patients is the ring that represents their significant others. Important to patients, essential if they are children, is active involvement of immediate family members, caregivers, and other close associates who provide assistance and may feel the impact of caregiving. In one study of 397 cohabitees, 12% always made sure that the person with whom they were living was taking his or her medication, and a further 30% usually, or occasionally, did so. Approximately 20% of cohabitees considered their own lives to be influenced to a considerable degree by the asthma of the person with whom they lived. In another study, 18% of parents said that their children’s asthma had either a great deal or quite a lot of influence on their lives. Interventions directed at family members have been shown to be effective both in improving their ability to help the patient manage asthma and in enhancing interpersonal relationships.

Beyond family members and significant others, health-care providers may comprise the most important people in the support systems of patients. Good asthma control requires the correct use of the right combination of medicines and an ongoing partnership between clinician and patient to ensure tailoring and retailoring of the regimen over time. Clinicians (the use of “clinician” in this article refers to all types of health-care professionals who treat patients with asthma) are the coaches of patients, aiding them to understand how to manage and prevent episodes of symptoms. The effect of education for clinicians on the health status of their patients has been demonstrated in two studies concerning other long-term conditions, and one study concerning asthma in particular. The last study demonstrated fewer symptoms and less health-care use by patients of physicians who had been trained to provide asthma patient education and foster effective asthma management by their patients. Other studies have demonstrated how patients can also be “taught” how to get more out of their consultation with their clinician.

Contacts in the workplace and at school also may be important influences helping or hindering those with asthma to manage their conditions. Children with asthma spend a significant time at school, and asthma is the most common reason for a child to need to take medication during the school day. Despite this, care for those with asthma within the

![Figure 1. Circles of influence on asthma control.](http://journal.publications.chestnet.org/pdfaccess.ashx?url=/data/journals/chest/21977/)
school is often “disorganized,” and teachers often lack appropriate knowledge to provide safe care for those in their charge. Ninety-two percent of school-teachers in one study were shown to want further information about asthma. The physical environment at school and work has also been implicated in asthma exacerbations, and people responsible for maintaining a healthy school environment have been targeted for education, although a careful evaluation of environmental modifications at school has not been conducted. An asthma education intervention for children, provided at school, has been shown to ameliorate frequency of asthma symptoms and enhance school performance. There have been no published reports of similar educational interventions in the workplace.

Some community-wide programs to raise awareness of asthma and connect people in need to asthma services have been assessed and appear to enhance access to and utilization of medical care, although assessment has not been extensive. Large-scale public media campaigns have been conducted in Australia, the United Kingdom, Canada, and the United States, among other countries. The Australian effort has been ongoing since 1988, with the main themes being increased symptom recognition (1988), promotion of action plans and monitoring (1991), encouragement of asthma prevention (1992/1993), and the potential for people with asthma to lead normal lives (1995). An attempt has been made to evaluate the effort by testing the extent of message recall. Data suggested that up to 45% of adults recalled the 1992 campaign, and that half of these individuals could report asthma messages accurately. Between 1991 and 1993, Australia also evaluated the effect of mass media campaigns on help-seeking behavior. Adults and children with asthma reported a substantial improvement in this aspect of management of the condition.

Much has been discussed about the need for community-wide environmental control policies and programs, but no consensus is apparent regarding the type of policies to recommend, nor are there available definitive evaluations of the effect on asthma when community-wide environmental policies have been introduced. Other policies conducive to better asthma control, for example, allowing children to carry and use medicines at school, have been encouraged but not evaluated. Further, the effect of practices of the pharmaceutical and related industries has been discussed and debated. In some areas, the United Kingdom for example, campaigning by patient support organizations has resulted in the industry adopting uniform packaging to enable patients to distinguish type of medicine by color (for example, blue for bronchodilators), generally considered a positive innovation likely to facilitate education. Pharmaceutical companies worldwide are also active in clinician and patient education. The extent to which these business practices effect asthma outcomes has not been assessed.

In summary, a coherent asthma control strategy for an individual or population of people with asthma likely involves stakeholders across several circles of influence. However, the messages they deliver and actions they take are not always mutually reinforcing, and actions by stakeholders across the circles of influence are rarely intentionally coordinated.

**Barriers to Effective Asthma Control**

Several factors and practices appear to work against asthma control.

**Most Asthma Education Does Not Develop Patients’ Self-Regulation Skills**

Data suggest that the patients’ ability to manage chronic disease depends on their level of self-regulation. Self-regulation theory posits that the degree to which people acquire skills depends on a range of external factors (eg, the provision of effective medical care) and an equally complex range of internal factors. These intrapersonal factors are unique to an individual and often unknowable to those purporting to help him or her. They include personality characteristics, motives, fears, past experiences, and a range of other psychosocial attributes. Starting from this base of internal characteristics, individuals draw information and assistance from their external resources (role models, health professionals, etc.), try out new behavior, and judge whether the actions they take work or do not work to get them to their personal goal. While the asthma control goal for a health professional might be clinical (eg, an improved FEV1 value), for patients, the goal is almost always personal (eg, playing basketball, taking part in social events, etc.).

Self-regulation is a sophisticated form of human problem solving where the individual observes and assesses factors in the social and physical environments (eg, no private place to take medicines while on the job) and tries out remedies to a problem (eg, using medicines only at home in the effort to ensure privacy and keep symptoms at a bearable level). When they personally derived remedies are evaluated by them as achievable and effective, they develop the confidence and motivation to continue behaving in the same way. Over time, through the process of self-regulation, people develop a repertoire of asthma management strategies they believe are most conducive to their personal situation and
goals. Left on their own without guidance on how to effectively monitor, use criteria, or assess outcomes, patients may still derive management strategies similar to those clinicians and educators would recommend; however, more often they do not. Most patient asthma management behavior is learned in such a self-regulatory process, and most patients, barring psychopathology, have reasons that make perfect sense to them for choosing to do what they do. Evidence for suboptimal self-regulation by patients is available in a UK study, where over half the patients surveyed described frequent symptoms and significantly limited activity. At the same time, almost half reported that they did not want regular follow-up and review by a clinician. These factors suggested a less-than-desired ability to observe oneself, make judgments using criteria—for example, the benchmarks of no symptoms and full functioning—and react appropriately. With education that engenders strong self-regulation skills, most patients can learn to be more effective in monitoring and evaluating their conditions, and can find reasons to follow good clinical recommendations.

We have noted that both internal and external factors influence behavior. Because each individual has his or her own personality, past life experiences, fears, and ambitions, one approach to changing asthma management behavior might be to attempt to alter these intrapersonal characteristics. That path to behavior change would involve considerable effort, time, and psychological expertise. A more practical solution is to focus efforts on improving the individual’s behavior by increasing self-regulation skills, as these are observable and can more easily be augmented unless, of course, the patient presents with psychopathology. People automatically use self-regulation processes in a highly individualized way by virtue of their intrapersonal characteristics. Rather than focusing on asthma information, patient education must offer patients different and better ways to self-regulate. These include enabling people to analyze data collected from symptom and peak flow monitoring, teaching patients how to use specific criteria to assess effectiveness of medicines, and evaluating the actual effect on symptoms of exposure to allergens/irritants, etc. Such education enables patients to make optimum use of the advice and counsel of their clinicians, and to develop their own management strategies in the most informed way. Education that develops self-regulation is both specific to the individual (as he or she uses self-regulation processes in a highly personal way to derive individualistic management strategies) and generalizable to a large population (as the self-regulatory processes actually taught are the same across individuals). The latter attribute of self-regulation makes it potentially possible to provide education in a standardized and systematic way. Most asthma education offered to patients does not appear to develop these skills, but simply provides information and orients people to the use of action plans and peak flow monitoring. Even these efforts do not seem to be widely evident. In a study of a representative sample of 2,400 asthma patients in the United Kingdom, just under half those participating said asthma was not explained to them when first diagnosed. More than 90% said they had received no treatment or management plan. Half of them said they had not been told how to recognize the onset of an asthma attack or what to do during an attack.

There are several very specific techniques clinicians can use to encourage self-regulation in their patients. These include the following: (1) reviewing means by which patients can learn how to observe themselves and their conditions, e.g., peak flow monitoring or use of symptom diaries; (2) encouraging patients to observe whether recommendations (such as proper use of medicine or removing environmental triggers) actually reduce symptoms; (3) helping patients to connect actions and results, i.e., enabling them to have appropriate outcome expectations; (4) providing written instructions that outline how to use medicine differently when symptoms or conditions change helps patients to make better management decisions; (5) giving patients benchmarks of a successful therapeutic plan (e.g., sleeping through the night, being symptom free when exercising) can improve judgement and use of medicines; and (6) giving reassuring messages about the patient’s ability to control the disease and verbally reinforcing patient reports of positive management actions serves to develop self-confidence. Encouragement of these aspects of self-regulation has been shown to be effective not only in asthma, but heart disease and diabetes as well.

Clinician Doubts About Education and Counseling and Insufficient Skills To Provide It

One of the problems regarding implementation of effective patient education may be that it has not been sold or “marketed” to physicians in an appropriate way. Most interventions offered to patients by physicians involve prescription medicine. To write such a prescription for a specific product, the physician needs to know who to give it to, what dosage to recommend, and what to watch out for or do during follow-up. Answering the same questions regarding asthma education might be a way to make it more acceptable to clinicians, and such an approach can be based on evidence already available.

Who Needs It? The rates of noncompliance with medical therapies across all diseases including...
What Type and Dose? The kind and amount of education needed may well vary according to the patient. If the focus, as we recommend, is helping the patient to be more self-regulating, the educational challenge is not how much information the patient needs, but rather how skillful he or she is in observing and evaluating, etc. Indeed, Zimmerman et al developed a scale for determining the level of self-regulation skills of an asthma patient. If a patient is a high-level self-regulator, the education needed may be as simple as providing criteria for evaluating the effect of the therapeutic plan the clinician provides. The high-level self-regulator may also benefit from being provided optional means for monitoring asthma, and being directed to alternate sources of information about the condition. For the person whose self-regulation skills are at a low level, intensive education would likely be needed, i.e., the opportunity to learn how to monitor, evaluate, and strategize in a step-by-step way. Of course, for both levels of self-regulating, support must be provided in a way that acknowledges the patient’s culture and language preferences. The point here is that the focus of education must move away from providing information based on guesswork about what might cause a person to accept and follow the clinical recommendations, and instead focus on enhancing specific skills that enable a patient to come up with management strategies that are most personally suitable and closest to the clinician’s ideal.

What Should Be Done During Follow-up? Several signs indicate to the clinician that further asthma education for the patient is warranted. Breakthrough wheezing suggests either that the selected regimen is not working for the patient, or the patient is not following the regimen as recommended. Sometimes, a review of how the patient used the medicine over the previous week can help the clinician make the distinction. If the latter is the case, the clinicians’ counseling, for example, can focus on the way the patient is using the self-regulation process to find the best management strategy. Is he or she adequately self-monitoring? What have these observations suggested to the patient about why symptoms are occurring? What strategy (different timing for doses, situations where preventive use of medications is indicated, means for avoiding triggers, etc.) might lead to better control? If serious concerns exist about the extent of symptoms, “booster” education may be necessary. For example, most patients’ skill in the use of metered-dose inhalers appears to deteriorate over time, beginning only 2 weeks from the time of initial instruction. Continuous attention and demonstration by the clinician at every follow-up visit is needed to ensure correct metered-dose inhaler use.

In delivering education, the clinician can use specific communication techniques that enable the patient to get the most from the exchange. These techniques, although relatively easy to learn, are not widely utilized. They include: (1) showing nonverbal attentiveness; (2) giving nonverbal encouragement; (3) giving verbal praise for things done well; (4) maintaining interactive conversation; (5) finding out underlying worries or concerns; (6) giving specific reassuring information; (7) tailoring medication schedules to the routine of the family; (8) reaching agreement with the patient on a short-term goal; (9) reviewing with the patient the long-term therapeutic plan; and (10) helping the patient to use criteria for making decisions about asthma management.
undertaken by various clinicians can overlap. If different clinicians’ provide a patient with different educational messages or advice, confusion results. If messages and advice provided in the school or work setting, provided by pharmaceutical companies, or emanating from other sponsors of education contradict those provided by clinicians, confusion grows.

Studies suggest that physicians must be involved in providing asthma education to patients for at least two reasons: (1) from the patient’s perspective, the physician continues to be the most credible provider of medical advice; and (2) the most successful medical regimens (ie, most likely to be followed) are derived through a process of negotiation between patient and clinician. In most systems, the physician continues to be the health professional who prescribes medicine. Nurses, health educators, respiratory therapists, and other health-care professionals can expand and reinforce the core messages and skills that the physician provides, but these efforts need to be cohesive and systematic. The coordinated actions of all, particularly if the focus is enhancing patients’ ability to be self-regulating, may significantly enhance disease control. Increasingly, technological means are available to enhance and coordinate efforts, eg, the Internet. Studies illustrate that when the educative roles of all personnel in the clinical setting are clarified and designed to be mutually reinforcing, asthma control in both individuals and a population of patients improves. In other words, it is possible and beneficial to introduce comprehensive systems into medical venues that enable clinicians to coordinate their treatment and education of patients with asthma.

**Actions to Make Asthma Education More Effective**

Five actions (Table 1) on the part of those involved in asthma education may enhance its effectiveness.

First is to ensure that the objectives, messages, skills, and processes of asthma education are consistent with the national asthma guidelines in use in a given country. Cabana and colleagues reviewed 76 studies describing why physicians do not follow guidelines for practice. They concluded that there are 10 types of barriers: (1) lack of awareness, (2) lack of familiarity, or (3) lack of agreement with guidelines; (4) low levels of confidence (self-efficacy) to use guidelines; (5) little confidence that following the guideline will produce the desired result (outcome expectancy); (6) inertia of previous practice, ie, little motivation for change; (7) external barriers that can’t be overcome (eg, lack of an institution-wide reminder system); (8) guideline-related barriers (eg, the difficulty of the guideline recommendation); (9) patient-related barriers (eg, the guideline is offensive to patients); and (10) environmental barriers (eg, poor reimbursement policies). Interventions that address these drawbacks could considerably enhance the extent to which physicians’ clinical practices follow expert recommendations. Employing clinical guidelines for asthma care consistent with national practices makes optimum the possibility of providing consistent and coordinated treatment.

Second is to focus on developing the skills of self-regulation in patients rather than bombarding them with information and directives. By learning how to observe, evaluate, and try out ways to control their asthma with the guidance of their clinicians, patients are most likely to devise effective strategies that they are motivated to continue to use. Further, when the strategy is no longer effective, patients will know how to devise new, more efficacious strategies, again in partnership with their health professionals. The asthma education provided to build this capacity in patients should be based on evaluated models. This practice works against the waste of resources that occurs when each provider “reinvents the wheel” (sometimes not effectively). It also helps the effort to coordinate and make asthma education consistent across providers.

Third is for the office, clinic, or hospital to develop a comprehensive plan for asthma treatment and education. Key in such a plan is the effective use of time and talent of each health professional seeing the patient. The plan assigns specific educational roles and builds on the particular strengths of these various professionals. Core messages and skills for the patient are introduced by the physician and reinforced and expanded by other clinicians in a coordinated, synergistic manner. Referral to organized programs or support groups provided by voluntary agencies or other outside sponsors is also integrated to provide opportunity for complimentary and comprehensive education. Interaction with schools, in the case of children with asthma, is established and maintained.

Fourth is to encourage clinicians to enhance their

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**Table 1—Five Clinician Actions To Make Patient Education Effective**

| Ensure education is consistent with national guidelines |
| Focus education on developing self-regulation skills |
| Create an office or institution-wide comprehensive plan for asthma treatment and education |
| Encourage clinician use of proven communication and educational techniques |
| Work with nonclinician patient education providers to coordinate community-wide efforts |
ability to counsel and advise patients and family members by using communication and educational techniques associated with positive patient behavior and long-term improvement in asthma outcomes.

Fifth is to ensure community-wide coordinated efforts. Clinicians can assist providers of education outside the clinical venues (e.g., national/district program, support groups) to consider how their efforts (1) compliment the asthma education provided in treatment settings, (2) focus on developing self-regulation skills of patients, and (3) systematically develop the capacity of key individuals across the circles of influence to help patients attempting to control asthma. One way clinicians can exert influence on providers of education outside the clinical venue is by participating in asthma coalitions and other community-wide asthma control efforts (e.g., community-, regional-, or state-level strategic planning) initiated by motivated individuals, voluntary organizations, or government agencies. An increasing number of asthma coalitions are evident (in the United States, the number is > 250). Such efforts have been shown to influence institutional arrangements for asthma treatment and criteria for asthma education. As asthma coalitions primarily focus on patient and professional education and on continuity and coordination of care, they hold promise for enhancing asthma prevention and control.

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