Asthma Self-Management Education*
Research and Implications for Clinical Practice

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Some of the early impetus for health education programs in asthma stemmed from concerns by physicians that the conventional interactions between doctors and patients with asthma were not having the intended effects of improving long-term respiratory health. Poor understanding of the complexities of asthma and inadequate adherence to prescribed medical regimens were associated with poor control of asthma. More recent impetus for health education programs has come from behavioral scientists and public health oriented groups concerned with the magnitude of the problem and also aware that the health care system is not having the desired effect of reducing asthma morbidity.

In June 1988, the National Heart Lung and Blood Institute (NHLBI) and the National Institute of Allergy and Infectious Disease (NIAID) convened a workshop‡ to consider a national strategy for improving the management of asthma. This article is taken from a presentation that was a basis for deliberations on self-management education at the NHLBI/NIAID workshop. It summarizes the implications of recent research findings for cardiopulmonary specialists and immunologists. It also outlines the role of specialists in furthering a national effort to improve asthma self-management.

INCREASED MORBIDITY AND MORTALITY

Recent morbidity data suggest that approximately 10 percent of United States residents have asthma or frequent wheezing at some point in their lives. In children between the ages of six and 11, the prevalence of asthma has increased from 4.8 percent in the late 1970s to 7.6 percent in 1980. The disease exacts an enormous toll on patients, families, and the health care delivery system. Of the chronic diseases of childhood, for example, asthma accounts for the greatest number of school absences. The disease has been linked to poor work and school performance, low self-image of patients, and disruption of family life. Lack of adequate treatment of the disease by the family has often been discussed as a factor in medical emergencies, and asthma ranks high as a reason for emergency room visits especially in low income populations.

Deaths from asthma, while still relatively small in absolute number, increased to 4,800 in 1985, and this increase is alarming.

RESEARCH IN ASTHMA SELF-MANAGEMENT

Managing asthma at home is a complex problem for most families, one that requires not only appropriate responses in the face of a wheezing episode, but efforts to prevent the onset of attacks, and attempts to reduce psychologic and social burdens that asthma imposes. Until recently, there were few models of systematic attempts beyond counseling provided by individual physicians to help patients improve their self-management skills. No rigorous evaluations of asthma education and counseling had been undertaken. In less than a decade, understanding of asthma self-management has developed greatly. While no one definition of at-home management of asthma has been accepted by clinicians or researchers, several descriptive studies have reiterated a set of patient and family management tasks. Further, a complement of studies is now available of rigorously evaluated asthma health education programs. Rigorous evaluation in this context means that the studies involved a large number of subjects and constituted a controlled clinical trial of the educational intervention or used a multiple time series design for evaluation. Persuasive data are available to show that educational interventions can improve self-management, reduce wheezing, help families adjust to the demands the disease imposes on family life, improve school attendance and performance, and change the use of health services, primarily, reduce emergency visits and hos-
These asthma self-management programs share three basic premises: the physician and patient are partners in the management of asthma; the context for management is variable, that is, the patient, his or her situation, medical treatment and the home environment are continually changing; and at-home management tasks must fit the family's lifestyle. At a general level, all of these programs cover the following topics: recognizing signs and symptoms of asthma; administering prescribed medicines correctly and managing side effects; remaining calm and avoiding panic; recognizing and responding to symptoms that require emergency care; reducing exposure to known triggers; normalizing the child's physical and social activities; and communicating effectively with physicians and other health care personnel.\textsuperscript{11-16}

**Implications for Practice**

In one way or another, each of these self-management programs stresses the need for a regular systematic approach to care of patients with asthma including the consistent use of medication as prescribed by the physician, the need to avoid triggers of asthma when these are known, and to initiate early drug therapy when this is not possible. These activities, together with effective communication with physicians, facilitate what has been referred to here as a partnership between the patient (and family) and the physician. The growing appreciation that a variety of mediators involved in chronic airway inflammation play an important role in the genesis of the disease\textsuperscript{24} has redirected medical attention towards regimens that suppress or reverse airway inflammation. Health education programs in self-management, by stressing adherence to these regimens, should be a great help in the implementation of physician recommendations.

We have in hand findings from several large carefully controlled research efforts, especially related to asthma in children, assessing the effectiveness of self-management education. These studies\textsuperscript{25-28} provide practitioners and teachers with models for effective intervention with asthma patients. Several programs which have been evaluated with small numbers of patients or with less rigorous evaluation designs have also been reported in the literature.\textsuperscript{29-30}

Self-management education programs have been designed for use in a variety of settings: outpatient medical facilities, schools, and homes. Evaluated programs have been conducted for families at differing economic levels, and of different ethnic groups. Just over one half of the available programs are designed for use with groups of patients and their relatives and just under one half are based on individualized instruction. At least one program is available in English and Spanish.\textsuperscript{8} Table 1 describes characteristics and outcomes of the eight large-scale, rigorously evaluated, self-management studies. Table 2 lists six other innovative programs with less rigorous evaluations.

**Role of the Subspecialist**

Leadership in the use, dissemination, refinement, and adaptation of the available self-management education programs rests with the cardiopulmonologists, allergy, and immunology communities. This leadership will take several forms. First, practitioners can adapt existing programs for use in their private practices or encourage the adoption of programs by the institutions with which they collaborate. Second, practitioners

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**Table 1—Large-Scale Asthma Self-Management Programs With Rigorous Evaluation**

<table>
<thead>
<tr>
<th>Program</th>
<th>Evaluator</th>
<th>Sponsor</th>
<th>Setting</th>
<th>Format</th>
<th>Patient</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma care training</td>
<td>Lewis et al\textsuperscript{8}</td>
<td>NIAID</td>
<td>Outpatient clinic</td>
<td>Group</td>
<td>Child</td>
<td>Improved self-management behavior</td>
</tr>
<tr>
<td>Air power</td>
<td>Wilson-Pessano et al\textsuperscript{9}</td>
<td>NHLBI</td>
<td>Outpatient clinic</td>
<td>Group</td>
<td>Child</td>
<td>Improved self-management behavior</td>
</tr>
<tr>
<td>Open air ways</td>
<td>Clark et al\textsuperscript{15,19}</td>
<td>NHLBI</td>
<td>Outpatient clinic</td>
<td>Group</td>
<td>Child\textsuperscript{†}</td>
<td>Improved self-management behavior</td>
</tr>
<tr>
<td>Open air ways at school</td>
<td>Evans et al\textsuperscript{17}</td>
<td>NHLBI</td>
<td>School</td>
<td>Group</td>
<td>Child\textsuperscript{†}</td>
<td>Improved school performance</td>
</tr>
<tr>
<td>Living with asthma</td>
<td>Creer et al\textsuperscript{13}</td>
<td>NHLBI</td>
<td>Outpatient clinic</td>
<td>Group</td>
<td>Child</td>
<td>Improved self-management behavior</td>
</tr>
<tr>
<td>Family asthma program</td>
<td>Hindi-Alexander and Cropp\textsuperscript{25}</td>
<td>ALA of Western NY Health Education Associates</td>
<td>Outpatient clinic</td>
<td>Group</td>
<td>Child</td>
<td>Increased use of peak flow meters</td>
</tr>
<tr>
<td>Teaching myself about asthma</td>
<td>Parcel et al\textsuperscript{26}</td>
<td>ALA of Western NY Health Education Associates</td>
<td>School and home</td>
<td>Group and individual</td>
<td>Child</td>
<td>Increased school attendance</td>
</tr>
<tr>
<td>Self treatment by adult asthmatics</td>
<td>Mainman et al\textsuperscript{26}</td>
<td>ALA of Western NY Health Education Associates</td>
<td>Emergency room</td>
<td>Individual</td>
<td>Adult</td>
<td>Increased feelings of control over illness</td>
</tr>
</tbody>
</table>

\*Available in Spanish.  
\†Evaluated with low income patients.
can introduce the idea of self-management tasks, as identified in the studies discussed here, into their ongoing counseling of patients and family members. Third, physicians can encourage local and regional medical and voluntary organizations to sponsor education for general practitioners, patients, families and the general public regarding the need for asthma self-management and up-to-date, on-going medical care. Fourth, the practicing community can identify and communicate to their colleagues in academic research aspects of asthma self-management deserving of further study. Finally, teachers in academic medicine can influence physicians in training to adopt and adapt education and counseling related to asthma self-management as they prepare for and enter their subspecialties. Participation by the subspecialist is fundamental to engender significant changes in the dismaying statistics regarding asthma morbidity and mortality.

Areas of Needed Investigation

While considerable progress has been made in a relatively short period of time in furthering the efficacy of self-management education for patients with asthma, there are several overlooked areas or new areas of inquiry deserving attention. Some of the next steps in asthma education research undoubtedly will include design and implementation of programs for specific populations, for example, very young children and hard-to-reach groups; investigation of physician-patient interactions most conducive to adequate asthma self-management; design and evaluation of programs based on developing behavioral science theories; and identification of ways to disseminate more efficient and effective models of education to the medical community and to patients and families with asthma.

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