



# *New Hampshire Asthma Control Program*

## *Evaluation Report*

### **Introduction**

Like other states in New England, New Hampshire is confronted by growing challenges from asthma. According to the 2004 Behavioral Risk Surveillance System, over ten percent of adults and nearly eight percent of children in New Hampshire have asthma. This chronic condition can be successfully controlled with daily medication and careful attention to relevant environmental triggers. When poorly controlled, however, asthma can result in loss of productivity at school or work, limitations in physical activity, and a lower quality of life. Left untreated, asthma can lead to deteriorating lung function and acute asthma flare-ups that may require urgent care and even costly hospitalizations.

The Centers for Disease Control and Prevention provides grants to help states address the challenges posed by asthma. The New Hampshire Asthma Control Program is sponsored by one of these grants. An array of partners are engaged in a broad range of activities to improve health outcomes of people with asthma through improved clinical care and asthma management and to promote asthma-healthy environments by improving indoor and outdoor air quality and raising public awareness of asthma.<sup>1</sup> To document these efforts, the NH Asthma Control Program utilized the research and evaluation services of the NH Minority Health Coalition through a contract with the Southern NH Adult Health Education Center.

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<sup>1</sup> New Hampshire Asthma Control Program. New Hampshire Asthma Plan: Meeting the Challenge of Asthma in New Hampshire. Concord NH: NH Department of Health and Human Services, 2004.

This report documents the results of a qualitative evaluation conducted by Chris Smith, Director of Research and Evaluation of the NH Minority Health Coalition. The evaluation has two components: First, a case study of asthma control and prevention activities in Manchester, New Hampshire was performed; second, an inquiry into the process and outputs of the NH Asthma Steering Committee was also conducted. Both components of the evaluation were based on telephone and in-person interviews with Steering Committee members, local asthma educators, program coordinators and asthma champions. Direct observations of the state's foremost asthma educator were also made by the evaluator to assess how training sessions are conducted in clinical settings.

During the development of this report, the National Asthma Education and Prevention Program of the National Heart, Lung and Blood Institute released a comprehensive revision of their clinical guidelines for the diagnosis and management of asthma.<sup>2</sup> This new expert panel report updates guidelines that were endorsed by the National Institutes of Health ten years ago with a rigorous, scientific review of the latest clinical research regarding evidence-based care for asthma. The newly released 2007 guidelines were reviewed for this study to highlight those elements that could be useful in updating professional development and education messages in light of the latest scientific advances in asthma care. Of particular note are the expanded recommendations for children with asthma from five to eleven years of age, and the refinements to both the model for classification of asthma severity and the stepwise approach to asthma management (displayed in Appendix A and described, below).

This report is comprised of separate sections for the two main components of the study. The Manchester case study describes in some detail the range of activities underway to improve asthma management and control, featuring:

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<sup>2</sup> The Expert Panel Report 3 (EPR-3): Guidelines for the Diagnosis and Management of Asthma from the National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program (NEAPP), pre-publication release of the full report, August 28, 2007. Available online at: <http://www.nhlbi.nih.gov/guidelines/asthma/index.htm> . Referred to as the EPR-3 NIH Guidelines in this document.

- *Provider Education* to improve health outcomes for people with Asthma by training healthcare providers about the latest clinical guidelines for the management of asthma
- *Healthy Schools* initiatives offering individualized education to elementary school students with asthma and support to school nurses through the Open Airways program, and branching out into the general school population with a new science curriculum, the Air Quality Toolkit
- *Healthy Homes* to improve indoor air quality with home health assessments conducted by the Manchester Health Department in partnership with a certified asthma educator

Results from qualitative interviews with members of the NH Asthma Steering Committee are then presented in the second section of the report. Themes regarding the importance of statewide coordination and collaboration are explored along with member feedback and suggestions about the group's structure and process. Recommendations from both components of the study are then discussed, with emphasis on the recently released guidelines from the National Asthma Education and Prevention Program of the National Institutes of Health (NIH). Lastly, the report concludes with visionary comments by steering committee members of what New Hampshire would be like if the NH Asthma Control Program were a complete success.

### **Case Study of Asthma Control and Prevention in Manchester**

The community of Manchester was selected for more in-depth study for two principal reasons. First, the Manchester Health Department coordinates a comprehensive approach to asthma control and prevention with support from multiple funding sources. Second, epidemiological data demonstrates that the city of Manchester has a serious problem with asthma, particularly amongst its young people. During the 2004-2005 school year, over 1,500 Manchester public school students (or approximately 8.8%) were reported to have a diagnosis of asthma.<sup>3</sup> According to the city's health department, more acute asthma episodes among young people have been reported in Manchester, as compared to the rest

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<sup>3</sup> Manchester Health Department, School and Youth Health Division. Medical Alert List from School Nurses in 21 Manchester Public Schools.

of New Hampshire. In Manchester in 2004, there were nearly 800 asthma-related visits to hospital emergency departments per 100,000 people under age 25, compared to 578 per 100,000 in the rest of the state. Similarly, there were over 130 asthma-related hospitalizations per 100,000 people under age 25 in Manchester in 2004, compared to 65 per 100,000 young people in the rest of the state.<sup>4</sup>

## **Provider Education**

The NH Asthma Control Program sponsors a range of professional development and educational programs for healthcare providers. Several clinical practices in Manchester, including the community health center and Child Health Services as well as some of the larger private practices in the area, have participated in the Lunch & Learn training series on asthma. The training sessions are conducted by Mary Bouthiette, certified asthma educator, and coordinated by the Southern New Hampshire Adult Health Education Center.

The curriculum is comprised of six sessions that emphasize the four components of asthma care specified by the NIH in their guidelines since 1997:<sup>5</sup>

- Assessment and monitoring
- Control of environmental factors contributing to asthma severity
- Asthma medications for long-term control and quick relief
- Education for a partnership in asthma care

### *ASTHMA ASSESSMENT AND MONITORING*

Training of clinicians and patients highlight the importance of using spirometry to diagnose asthma and peak flow meters to routinely monitor airway function. Asthma educators

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<sup>4</sup> Manchester Health Department, Public Health Assessment and Planning, Inpatient Hospital Discharge Data, 2004.

<sup>5</sup> EPR-3 NIH Guidelines, full report, August 28, 2007. See also, Practical Guide for the Diagnosis and Management of Asthma Based on the Expert Panel Report 2: Guidelines for the Diagnosis and

teach patients how asthma narrows the airways due to swelling, smooth muscle constriction and mucus, which in turn reduces the speed of a vigorously exhaled breath as measured by the peak flow meters. Clinicians are taught to include peak flow monitoring in the patient's treatment plan and to demonstrate to patients how to use these simple, portable devices to routinely monitor their asthma.

In addition, clinicians are strongly advised to use spirometry to formally diagnose a patient with asthma. Because it is the most reliable measure of lung function, the EPR-3 NIH Guidelines stipulate that spirometry is to be used to verify a diagnosis of asthma by establishing both airflow obstruction and short-term reversibility in response to a short-acting bronchodilator.<sup>6</sup> As explained in the EPR-3 NIH Guidelines:

"Patients' perception of airflow obstruction is highly variable, and spirometry sometimes reveals obstruction much more severe than would have been estimated from the history and physical examination [alone]."

Spirometry is also useful in ruling out an alternative diagnosis of less common conditions such as cystic fibrosis or vocal cord dysfunction which can also decrease airway function and yield low peak expiratory flow measurements.

The importance of spirometry is emphasized in the Lunch & Learn training session that is exclusively devoted to performance standards in the use of spirometry. However, not all practices participate in all sessions. Further, spirometry equipment is not always available on site at all clinical practices in New Hampshire due to cost considerations, so patient referrals are then necessary to confirm the diagnosis of asthma. Spirometry needs to be more readily available to community health centers and private medical practices alike so that spirometry can be used to monitor asthma management as well. EPR-3 NIH Guidelines recommend that spirometry be conducted annually to track either improvement in response to treatment or progressive loss of lung function over time.

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Management of Asthma, NIH Publication No. 97-4053, October 1997.

<sup>6</sup> For details, see "Box 3-2: The Importance of Spirometry in Asthma Diagnosis," page 43 of the EPR-3 NIH Guidelines, August 28, 2007.

*THE ASTHMA ACTION PLAN*

The training emphasizes the development of an asthma action plan, a key component of the patient treatment plan, which is written in partnership with the patient to clarify steps to be taken to manage the patient's asthma. The plan reminds the patient of all the basic information that should have been conveyed by the clinician when the patient was first diagnosed with asthma. The written form lists the signs and symptoms of worsening asthma, relevant environmental triggers, and which controller and relief medications are recommended for that particular patient. For children with asthma, the written asthma action plan can be especially helpful when shared with the school nurse to improve treatment adherence while at school.

The American Academy of Family Physicians publishes an Asthma Action Plan for children that can be viewed at:

[http://www.kidshealth.org/PageManager.jsp?dn=familydoctor&article\\_set=41793&lic=44&cat\\_id=20405](http://www.kidshealth.org/PageManager.jsp?dn=familydoctor&article_set=41793&lic=44&cat_id=20405)

This version of the Asthma Action Plan is written in plain English using a format that is easy for clinicians to complete and patients to follow. The top of the form includes a checklist of triggers to avoid and special instructions for an exercise-induced asthma flare-up. Along the left column, peak flow ranges are clearly specified for each of the three zones, each with its own instructions regarding which medicines to take, how much and how often. Controller medicines are listed under the Green Zone, also referred to as the Safety Zone, in which the patient has no breathing problems and can do usual activities. Quick-relief medicines are added in the Yellow or Caution Zone, where some shortness of breath, coughing or wheezing are reported. For more severe symptoms, instructions for the Red or Danger Zone clearly state, "Take this medicine and call the doctor now!" and "If symptoms don't improve or you can't contact the doctor, go to the hospital or call 911."

*CONTROL OF ENVIRONMENTAL TRIGGERS*

The Lunch & Learn session on patient education also covers the identification, avoidance and control of environmental triggers at home, school and work. Both outdoor and indoor air quality is addressed in the session. The training encourages providers to teach their patients with asthma to avoid common environmental triggers including: allergens such as dust, mold, and pet dander; exertion outdoors when air quality is poor; and exposure to tobacco and wood smoke. The EPR-3 NIH Guidelines emphasize this last point, recommending that people with asthma avoid "all exposure to environmental tobacco smoke and other respiratory irritants, including smoke from wood-burning stoves and fireplaces...." <sup>7</sup>

For those patients with persistent asthma, the clinician is encouraged to formally evaluate the potential role of allergens through the use skin testing or in vitro testing to reliably determine the patient's sensitivity to those allergens to which they are exposed. Rather than making the same recommendations about avoiding allergens to all patients who have asthma, the EPR-3 NIH Guidelines advises a more tailored approach:

"Allergy testing is the only reliable way to determine sensitivity to perennial indoor allergens.... Current recommendations for avoidance measures for dust-mite, cat, or cockroach allergens are allergen specific, and it is only possible to convince patients to undertake the measures once they know to what they are allergic.... Patients who have asthma at any level of severity should reduce, if possible, exposure to allergens to which the patient is sensitized and exposed... [and] know that effective allergen avoidance requires a multifaceted, comprehensive approach; individual steps alone are generally ineffective." <sup>8</sup>

*Flu shots.* In alignment with the CDC Advisory Committee on Immunization Practices, the NH Asthma Control Program recommends influenza vaccinations for all people living with

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<sup>7</sup> Ibid., "Key Points: Control of Environmental Factors and Comorbid Conditions that Affect Asthma," page 165.

asthma, due to the potential risk for pulmonary complications from influenza. However, the EPR-3 NIH guidelines report that their review of clinical research revealed that influenza vaccines have *not* been shown to reduce either the frequency or severity of asthma symptoms during the influenza season.

#### *ASTHMA MEDICATIONS*

The Lunch & Learn series teaches the stepwise approach to asthma control that has been advised in the NIH Guidelines since 1997.<sup>9</sup> Chronic asthma is classified by severity in the initial diagnosis and then monitored by control of symptoms and functional impairments over time so that medication types and doses can be adjusted as appropriate. If control is not maintained in response to treatment, medication may be stepped up as needed; conversely, medication may be gradually stepped down after asthma is brought under control. The emphasis of long-term control therapy is on medications that can prevent the onset of acute episodes and reduce daily symptoms. Inhaled Corticosteroids (ICS) are recommended as the most effective long term control therapy for persistent asthma.

In addition to this controller medication, quick-acting relief or so-called rescue medications may also be required, particularly while the asthma is not yet under firm control. Short-acting Beta2-agonists (BA) are recommended as the most effective medication for quick relief of acute bronchospasm. In the session on asthma medications, providers are warned, however, that use of "More than one [BA] canister per month suggests inadequate asthma control and **the need to initiate or intensify long term control therapy**".<sup>10</sup> This is consistent with the EPR-3 NIH Guidelines which also stipulate that quick-relief medications should not be taken on a routine daily basis. In the event of an acute asthma flare-up, doses of the quick-relief medications can be repeated up to three times at 20

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<sup>8</sup> See "Box 3 – 6 . Rationale for Allergy Testing for Perennial Indoor Allergens" page 169, EPR-3 NIH Guidelines, August 28, 2007.

<sup>9</sup> The Expert Panel Report 2 (EPR-2): Guidelines for the Diagnosis and Management of Asthma. The National Heart, Lung, and Blood Institute, National Asthma Education and Prevention Program (NEAPP), National Institutes of Health pub no 97-4051, 1997.

<sup>10</sup> Bouthiette, Mary E., RN & AE-C, September 2006, Asthma Lunch & Learn training series session, "Asthma Medications".

minute intervals according to the EPR-3 NIH Guidelines. They also cite the use of quick relief medications more than twice a week as another indicator of poor asthma control.

The stepwise approach to asthma management considers both symptom frequency and objective measures of lung function based on spirometry and peak flow meter results. In the Lunch & Learn series, chronic asthma is classified into four levels of severity determined by the most severe symptom or test result. Table 1 displays a summary of the classification scheme and treatment recommendations presented in the session, "Asthma Guidelines for The Way You Practice: Diagnosis and Management." The new EPR-3 NIH Guidelines have advanced the stepwise approach to asthma management. The new EPR-3 classification tables for severity and control expands the impairment domain to consider the frequency of use of short-acting BA medications, and adds a new domain for risk that is defined as the likelihood of exacerbations from asthma and/or the progressive decline in lung function in adults or reduced lung growth in children.<sup>11</sup>

Professional development and educational materials disseminated by the NH Asthma Control Program should be updated to reflect new information from this recent release from the NIH. A summary report is scheduled for release in December 2007 which may be more suitable for dissemination to clinicians than the lengthy and technical full report of the third expert advisory panel that is currently available from NIH.

In addition to long-term controller medications and those for quick-acting relief of acute symptoms, subcutaneous allergen immunotherapy may also be advisable for patients with persistent asthma that is clearly related to exposure to an allergen to which they have been proven (via skin testing or in vitro testing) to be sensitive. The EPR-3 NIH Guidelines indicate that clinical evidence is strongest for immunotherapy for house-dust mites, animal danders, and pollens; whereas evidence is weak or lacking for this kind of treatment for sensitivity to mold or cockroaches.

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<sup>11</sup> See Appendix A for sample figures, excerpted from the EPR-3 full report, that could be useful in updating the Lunch & Learn training materials.

<i>Lunch &amp; Learn Training: Stepwise Approach for Managing Asthma in Adults and Children over 5 years of age.</i>		
<i>Severity</i>	<i>Indications</i>	<i>Treatment</i>
<b>Mild Intermittent</b>	<p><i>Symptoms:</i> No more than 2 days/week No more than 2 nights/month</p> <p><i>Test Results:</i> PF or FEV1 ≥ 80% Variability &lt; 20%</p>	No daily controller medication, Short-acting Beta2-agonists (BA) as needed.
<b>Mild Persistent</b>	<p><i>Symptoms:</i> More than 2 days/week, but not daily More than 2 nights/month*</p> <p><i>Test Results:</i> PF or FEV1 ≥ 80% Variability 20-30%</p>	Low-dose Inhaled Corticosteroid (ICS) **
<b>Moderate Persistent</b>	<p><i>Symptoms:</i> Daily More than 1 night/week, but not nightly</p> <p><i>Test Results:</i> PF or FEV1 60 - 80% Variability &gt;30%</p> <p><i>Impairment:</i> Asthma flare-ups affect activity</p>	Low-to-medium dose ICS plus long-acting Beta2-agonists (LABA) if needed **
<b>Severe Persistent</b>	<p><i>Symptoms:</i> Continual daytime Frequent nighttime</p> <p><i>Test Results:</i> PF or FEV1 ≤ 60% Variability &gt;30%</p> <p><i>Impairment:</i> Limited physical activity</p>	Low-to-medium dose ICS and LABA plus oral corticosteroids, if needed **
<p>* EPR-3 NIH Guidelines specify no more than 3-4 nights/month for mild persistent asthma. ** EPR-3 NIH Guidelines also recommend short-acting BA medications for quick-relief of acute symptoms of persistent asthma when necessary.</p>		

*Goals of pharmacologic therapy for asthma.* During the Lunch & Learn training series, healthcare providers are reminded of the range of goals of medications to promote the long-term control of asthma. Beyond the obvious goal of fewer or no visits to the Emergency Department and no hospitalizations due to asthma, improvements in asthma control should help maintain (near) normal lung functions and avoid chronic symptoms during the day or night. Some of the stated goals highlight the theme of partnership in care such as patient satisfaction and minimal or no adverse side-effects from the treatment. The training also stresses the importance of reducing limitations so that the patient can maintain routine activities and attend school or work without interference from asthma.

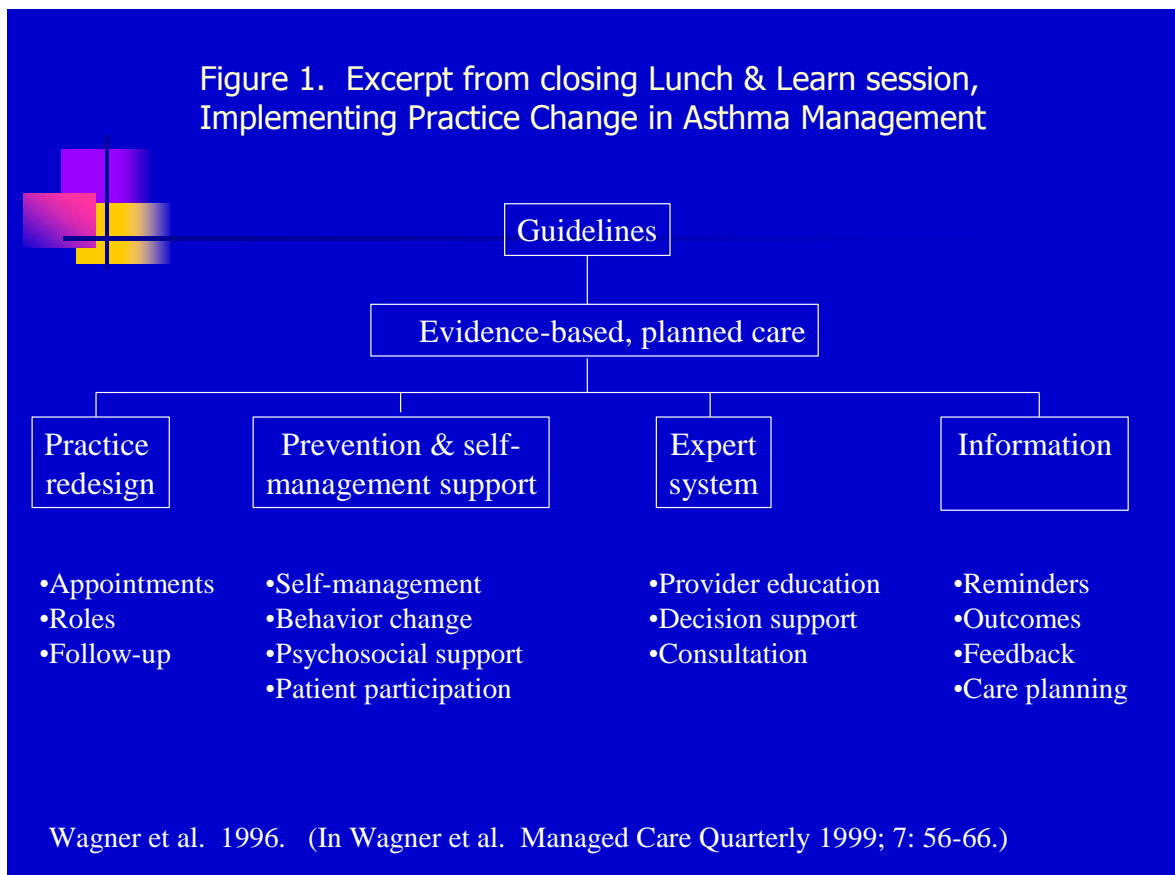
*OBSERVATIONS ON HOW LUNCH & LEARN SESSIONS ON ASTHMA ARE CONDUCTED*

As part of this case study, the evaluator observed three Lunch & Learn asthma training sessions conducted by Mary Bouthiette. Overall, she exhibited an engaging training style, expanding beyond the bullets of the presentation to share anecdotes from her experiences as a clinician, as a teacher of children with asthma, and as someone living with asthma herself. She offers to assist the practices with whatever means possible, using a non-threatening and cooperative approach to promote practice change.

Most remarkable was the asthma educator's rapport with the clinical staff at each of the observed practices. She aligned herself with the asthma champion inside the clinical practice, who will serve as a liaison for future training and practice change. Assigning a staff member who has or will become a certified asthma educator to be the asthma champion of their clinical practice helps to focus staff attention. As a nurse who worked in a clinical practice for many years, the trainer was able to relate to the work environment of healthcare providers. She acknowledged the time limitations imposed by managed care while still prodding clinicians to make time to teach patients how to manage their asthma. She continually emphasized the need for a true partnership between healthcare provider and patient to improve treatment adherence to the asthma action plan.

The session on asthma management tools was enhanced by the physical demonstration of the range of respiratory devices available. As a person living with asthma herself, the trainer could speak from personal experience and demonstrate how to use different inhalers. She also demonstrated ways she has seen children "cheat" on their peak flow measurements by using their posture to get gravity to drive the meter reading higher. She interjected anecdotes from the home-based education she does as well, helping providers see the point of view of the parent of a child with asthma.

Figure 1, below, contains a sample slide from the final session in the Lunch & Learn series, depicting a model for evidence-based care. The figure provides a schematic overview of how the clinical practices can continue to improve the quality of the care they provide by attending to each of the four components. The elements noted in the bulleted lists below each component have not only been discussed in previous sessions but are also covered in the Asthma Toolbox that is given to the Asthma Champion in each practice.



*THE NH ASTHMA TOOLBOX*

At the final session of the Lunch and Learn training series, the clinical practice is presented with a certificate of completion and an Asthma Toolbox of supplies. The materials are packaged into a plastic carryall box that has a handle to be portable and form a literal toolbox. It is organized into color-coded sections with sample hard copies of all the reference tools and patient educational materials that have been recommended by the NH Asthma Control Program.<sup>12</sup> Clinicians are encouraged to go to the AsthmaNow.net website to print more copies of patient educational materials and other reference documents as needed. Order forms for posters and other office displays are also included in the toolbox.

The NH Asthma Toolbox is organized into four major sections as follows:

- Office Reference Tools – including links to the EPR-3 NIH guidelines of the diagnosis and management of asthma, along with the 1997 guide for clinical practices and the 2004 guide of best practices in pediatric care of asthma.
- Office Tools – such as sample copies of the Asthma Action Plan, school-provider medical release forms that enable clinical practices to share information relevant to the diagnosis of asthma with the patient's school nurse, and a decision tree for clinicians on the management of acute asthma episodes.
- Patient Education – materials specifically written for children, materials available from pharmaceutical companies and their contact information, environmental resources on reducing asthma triggers like mold and other allergens, smoking cessation and prevention resources
- Office Display and Materials – such as magazines and newsletter publications on asthma and allergies for the waiting room, and links to publishers of patient handouts, posters and displays.

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<sup>12</sup> The AsthmaNow.net website lists these principal collaborators in the development of the toolbox: American Lung Association of NH, Southern NH Area Health Education Center, and Chronic Conditions Information Network.

## Healthy Schools

### *OPEN AIRWAYS*

While the pediatrician's office is the likely the first place children with asthma and their parents learn how to manage the condition, this education must be reinforced in the schools. To expand on the limited time healthcare providers can spend on patient education, specialized training for children with asthma is offered in Manchester elementary schools. Administered by the Manchester Health Department, Open Airways is an educational program originally designed by the American Lung Association for 8- to 11-year olds with asthma. The curriculum addresses the following topics:

- What asthma is and how it effects a person's breathing
- How to avoid triggers and recognize the warning signs of an acute episode
- How and when to use quick-relief and control medications and devices
- How to decide when to go to school, call the doctor, or go the hospital

The program is conducted by Mary Bouthiette, certified asthma educator, with small groups of children referred by their school nurse. In this setting, the asthma educator can not only discuss the topics above, but more importantly, she can physically demonstrate how to use inhalers and peak flow meters. Working with only a few students at a time, the asthma educator can also observe how each child uses his or her own equipment and thus correct any mistakes in the student's breathing techniques or posture. Each student receives immediate feedback to improve the efficacy of the actual administered dose of medication delivered by the inhaler and the reliability of their peak flow expiratory rate measurements.

Open Airways has been conducted in 12 of the 14 elementary schools in Manchester, with the final two schools scheduled for this fall. In addition to training children how to manage their asthma, Mary Bouthiette also collaborates with the school nurses to ensure they have the skills and supplies they need to help their students who are living with asthma. With

the parent's permission and in cooperation with the child's pediatrician, she encourages the school nurse to obtain a copy of the student's asthma action plans. The school nurse can then use the plans proactively to help students better manage their asthma and also to respond appropriately in the event of an acute episode.

To help their classmates understand the challenges faced by students with asthma, Mary Bouthiette is working with one center city elementary school in Manchester to incorporate more general information on asthma into health education classes. The purpose is to raise awareness among the student body as a whole and give them the knowledge and skills they need to assist someone suffering from an acute asthma episode, should the need ever arise, either inside or outside of school.

#### *AIR QUALITY TOOLKIT*

To continue asthma education as students progress into middle school, a new science curriculum has been developed through a collaboration of the Manchester Health Department, the NH American Lung Association, and the NH Department of Environmental Services. The Air Quality Toolkit features reading materials, classroom experiments and homework exercises organized into the following six units:

- Air pollution, the sources, and the connection with weather
- Ozone: Beneficial high-level stratospheric ozone and harmful ground-level tropospheric ozone.
- Particle pollution
- Transportation as a source of air pollution
- Indoor air quality
- Impacts of air pollution on human health and the environment

Activities in this toolkit were compiled predominantly from two curriculum guides. First was an older publication from 1994, the EPA's Project A.I.R.E. [Air Information

Resources for Education (K-12)], A Guide for Instructors, that provided some time-tested exercises and activities on weather, air pollution, and indoor air quality.<sup>13</sup> To include more recent exercises that draw on real-time data from the Internet, the “Air Pollution: What’s the Solution?” curriculum from the Center for Innovation in Engineering and Science Education at Stevens Institute of Technology was also used.<sup>14</sup> This curriculum guide meets National Science Education Standards and provided the Air Quality Toolkit with activities and experiments about the sources of air pollution, its environmental and health effects, and how weather impacts outdoor air quality.

Over this past summer, a draft of the toolkit was reviewed thoroughly by a middle school science teacher. The toolkit was then revised to feature a more user-friendly structure organized into units and including background reading materials such as EPA fact sheets, grade-appropriate lesson plans, and associated worksheets or graphics. The reviewer recommended a consistent format for each Unit, with tabs and table of contents, to assist science teachers in finding the materials that will be most relevant to their lesson plans. The revised toolkit also features a matrix that cross-references lessons with the NH Science Frameworks to show teachers how the lessons can be used to fulfill the new state science education requirements.

The Air Quality Toolkit will be piloted by middle school science teachers in McLaughlin Middle School in Manchester during the current school year. With feedback from educators, appropriate changes to content, and upon approval of the Health Department and the School Board, developers hope to make the revised toolkit available to science teachers across the school district, and perhaps the state, in subsequent school years.

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<sup>13</sup> Available online at <http://www.epa.gov/ne/students/teacher/aire.html>, accessed on September 14, 2007.

<sup>14</sup> Available online at <http://www.ciese.org/realtimeproj.html>, accessed on September 14, 2007.

## Healthy Homes

In addition to school-based initiatives like Open Airways, the Manchester Health Department also administers a grant from the EPA to do home-based asthma education and environmental health services. This is the type of multifaceted, home-based approach to allergen control recommended in the new EPR-3 NIH Guidelines as proven effective for reducing exposure to allergens and other environmental triggers for patients who are sensitive to these allergens. The types of services and supplies provided with funding from the EPA are among those cited in the EPR-3 NIH guidelines as proven effective in reducing exposure to allergens for patients with asthma-related allergies.<sup>15</sup>

Known as the Multilingual Asthma Education and Outreach Project, the program serves up to 50 families in Manchester who have children suffering from persistent asthma. Families are referred into the program predominantly from their school nurse or from Child Health Services. About half of the families have limited English-proficiency, so they are served with the assistance of an interpreter.

The goal of the program is to provide education to children with asthma and their parents, along with services and products to mitigate allergens and other environment triggers in their homes. Mary Bouthiette, certified asthma educator, visits the home accompanied by an inspector from the Manchester Health Department's Environmental Health division. Education focuses on improving self-management of asthma by monitoring lung function with peak flow meters and following the asthma action plan according to the results. The asthma educator not only discusses the treatment plan with the parent(s) and child, but also has the child physically demonstrate how he or she uses their inhalers and peak flow meters. Then, the educator can correct any errors in the child's breathing technique or posture in front of the parent. This also teaches the parent how the medication and peak

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<sup>15</sup> See "Section 3, Component 3: Control of Environmental Factors and Comorbid Conditions That Affect Asthma," EPR-3 NIH Guidelines, August 28, 2007. For details, see "Figure 3 – 2 0. Summary of Measures to Control Environmental Factors that can Make Asthma Worse," page 188.

flow measurements should be taken so that he or she can monitor the child's technique in the future.

The asthma educator also visually inspects the asthma medications and devices to ensure they are up-to-date and in good condition. The most common issues with treatment compliance uncovered in these home visits are with the asthma medications and devices themselves. Often, the quick-relief medications have expired. Sometimes the parents are unaware that their child's inhaler is empty of controller medications, yet the child has continued to try to use it. Children may not have the right spacers to ensure the proper dose is being dispensed for their age and size. On occasion, outright medication errors on the part of the pharmacy that filled the prescription have been uncovered. For example, the asthma educator once visited the home of a 10 year-old who was trying to use an inhaler designed for a three year-old.

While the asthma educator discusses the child's asthma action plan with the parent(s), the environmental health services inspector conducts a home health assessment. The inspector assesses the home environment for allergens or other asthma triggers such as tobacco smoke, mold or harsh cleaning chemicals. Signs of pest infestations such as cockroaches or rodents are also investigated. As both incentive and a service to the families, dust mite-proof pillow and mattress covers and sometimes even HEPA-filter vacuum cleaners are supplied. The home visitors discuss environmental asthma triggers with the family, and encourage the family to solve the problem together. Family members who smoke, for example are encouraged to do so outside of the home, or, if they are ready to quit smoking, referred to a smoking cessation program. If the family has a dog or cat, they are encouraged to keep the pet away from the child's bedroom.

In those cases where the home inspection has uncovered serious health issues from poor housing conditions, officials from the Manchester Health Department have advocated for the family. The health department has joined in a collaborative partnership with interested professionals that have included the child's pediatrician, school nurse, and the environmental specialist who conducted the inspection of their rental housing. The home

inspection results can be used to document the severity of the triggers in the home and to exert pressure on the landlord to eliminate pest infestations. For some children with severe asthma, the collaborative partners may advocate for families with the city's public housing authority to help them relocate. The home inspection results can be provided as documentation of health needs to justify advancing the family higher on the housing authority's waiting list.

## **NH Asthma Steering Committee**

To describe the range of activities undertaken by the NH Asthma Steering Committee, the evaluator conducted individual interviews with committee members. Respondents included six state employees, five representatives from non-profit organizations, and three from managed care or other healthcare organizations. The individual interviews were conducted over the telephone at each member's convenience. While audio recordings are generally preferable as the source of qualitative data, this study was limited to contemporaneous notes to avoid any legal issues that might arise from recording telephone conversations. Interviews lasted between 20 and 45 minutes, and interview notes were analyzed using the MAXqda software package.

## **Key Themes**

The interviews addressed how well members understood the group's purpose and objectives, how satisfied they were with their level of involvement in the Steering Committee, and what impacts they perceived from the NH Asthma Control Program overall. Members were also asked about how their participation may have helped them to address Asthma in their organizations and communities. Interviews closed with an invitation to envision a future if the program were a complete success in New Hampshire. These closing comments will be quoted in the conclusion of this report.

*STATEWIDE COORDINATION AND COLLABORATION*

There was remarkable consensus that statewide coordination was the foremost value offered by the NH Asthma Control Program. All agreed that the asthma control activities in the state would not be as well orchestrated without the program, and that regional coordination would be lacking without leadership from NH DPHS. State employees applauded Lindsay Dearborn's collaborative work within the prevention bureaus in NH DPHS. One noted, for example, how asthma and tobacco control messages had been combined into educational materials that addressed the aims of both projects. Another noted closer collaboration between Special Medical Services (SMS) and Partners in Health, coordinating services to families.

Many members emphasized the value they draw from the program, providing as it does the "big picture" on asthma control activities from across the state. The Steering Committee meetings and email communications serve to keep members informed about who is working on asthma control and what they're doing to address various aspects of asthma in the state. As one member explained, prior efforts were not truly statewide because people "needed a force to bring members together" and the NH Asthma Control Program, along with its Steering Committee, became that unifying force.

*BENEFITS FROM MEMBERSHIP IN STEERING COMMITTEE*

When asked about the primary benefit of belonging to the Steering Committee, members unanimously replied, "Networking!" By promoting statewide collaboration so successfully, the project also offers its Steering Committee members a "great opportunity to tap into resources with all the organizations at the table." Again, many members credit Lindsay for fostering linkages between members who may not typically partner together. By bringing together high-level decision makers from member organizations, the meetings themselves become more valuable. As one member explained, "If the Steering Committee didn't exist, I'd have to do a lot more footwork" to get and stay in touch with managers from disparate

organizations that deal with asthma. Another said, "The group acts as a hub...giving everyone a chance to communicate about what else is happening around asthma." This benefit goes beyond the meetings to group membership in general, as the Steering Committee offers a centralized group to pose particular questions regarding asthma via email as well.

In addition to networking opportunities, members appreciate how much they learn from the meetings they attend. Members complimented the leadership for structuring the meetings to improve their knowledge about asthma, particularly clinical advances in the treatment and control of asthma. This makes the meetings more appealing to attend, as one member described, "I'm getting an education from each Steering Committee meeting I attend."

This information is often then disseminated at member's own agencies. As one explained,

"I use what I learn in the meetings to educate case managers who work directly with patients with asthma, so they will know about resources, latest clinical guidelines, supports out there to help them with asthma."

This education is not limited to clinical aspects of asthma control. One member of the Healthy Environments Work Group described how advances in environmental controls of asthma triggers (i.e., moisture and mold control) were also valuable lessons from the Steering Committee.

Lastly, some members noted their personal connection to asthma, either as someone themselves lives with asthma or who has someone close to them with asthma. Members who are more personally affected by the disease appreciate the opportunity to learn about clinical and environmental advances in asthma control and to be involved in making a difference in combating the disease.

## Feedback and Suggestions

### *STRUCTURE AND PROCESS*

With a single exception, members complimented the facilitators for well-run, clear, and informative Steering Committee meetings. Most liked the schedule of meetings because, as one member put it, "the real energy is in the Work Groups." Meeting every 3 or 4 months allows enough time for members to see real progress since the last meeting, and is a time commitment that even these busy professionals are glad to keep. While they may wish they had more time to engage in a Work Group, members appreciate the flexibility to limit their participation to the Steering Committee when that is the most they can commit to at a given time.

When asked about their role as a Steering Committee member, a theme emerged about sharing their point of view from outside the policy world:

"I offer the point of view of a non-clinician, reminding fellow Clinical Work Group members of the patient's perspective....I try to give a reality check. It's easy to make assumptions that everyone knows what clinicians know."

"I think the most important purpose of the Steering Committee is to give real life feedback to the state....from various [multidisciplinary] perspectives."

"I try to provide a real world view of what's happening with indoor environments"

The Work Group structure seems to function well for most members. One member credited the group's leader for the spirit of collaboration and energy:

"Lindsay's a really great salesperson. She can be very persuasive in recruiting new members and getting buy-in from the Steering Committee to move the project forward. She's always expanding out of the Work Groups, feeding back to the Steering Committee."

## **Recommendations**

### **From the NH Asthma Steering Committee**

While members were generally satisfied with how the Steering Committee functions, they did offer some specific suggestions for improvement. New member orientation is all the more vital precisely because the group is involved with so many aspects of asthma control across the state. Some of the members recall feeling a bit overwhelmed by the large packet of materials they received when they joined the committee. Members did not always have the time to read through the materials carefully enough to learn how the project works. A briefer overview, such as an executive summary of the NH Asthma Plan and organizational chart of the Work Group structure, would be useful in highlighting what new members need to know before they attend their first Steering Committee meeting. One member suggested that a summary include:

- The statement of the mission of the NH Asthma Control Program
- A description of the areas of focus and Work Group structure
- Contact information for the Work Group facilitators
- A clear explanation of what's expected of Steering Committee members, their roles and obligations

In addition, another strongly urged that each new member meet with Lindsay Dearborn prior to their first meeting to be briefed in person on how the Steering Committee works. After receiving and reading the executive summary, a one to one conversation with Lindsay would give a new member the opportunity to ask questions and clarify the most important points listed above. This would facilitate new members' involvement, and help them glean the most information possible; from the very first Steering Committee meeting they attend.

To encourage more involvement from members who live and work some distance away from Concord, members recommend more communications over the Internet. By

requiring people to come to Concord to attend meetings only three or four times a year, the Steering Committee meeting schedule helps. For those who want to be more involved, perhaps some of the Work Group tasks could be coordinated over the Internet. Perhaps a webpage on the AsthmaNow.net site could be devoted to members, inviting input and informing them about upcoming activities and events in between Steering Committee meetings. One member summed up the point, suggesting that the group:

"Open up communications to solicit more input via email, engaging people from across the state who can't often attend meetings due to time limitations or transportation demands."

The AsthmaNow.net website could also be expanded to inform community members about asthma-related activities and issues in NH. Another member recommended that the website be designed to allow a user to click on a map to find out the asthma prevalence rates and other epidemiological data about asthma in their area. The website could also highlight what is happening to fight asthma in a particular community, including clinical trials and patient or provider education programs.

Besides using the Internet to teach more citizens from New Hampshire about asthma, several members were keen to give consumers a stronger role in the program overall during the next grant cycle. As one advocate explained:

"More should be done to engage consumers...so we can hear directly from families about their struggles with asthma. There's a lot of power in hearing directly from clients about the challenges they face, their needs, what do they think should be the priorities for asthma prevention and control....Not necessarily to [have consumers] serve on the Steering Committee itself, but to advise us in some way. This would enable the project to mobilize citizens for advocacy. By building a grassroots network of those affected by Asthma, we could empower them to take action."

### From the Manchester Case Study

This report describes the multi-faceted approach taken in Manchester that brings together collaborative partners from public health, health care, education, and environmental services to improve asthma control in their community. Asthma control activities are

mainly coordinated by the Manchester Health Department. For example, its division of school health directs the activities of school nurses in the city, encouraging school participation in the Open Airways program for students with asthma. With support from a grant from the Environmental Protection Agency, the health department's Multilingual Asthma Education and Outreach Project provides home-based education and environmental assessments to children with asthma and their families. The asthma education component of these programs is provided by Mary Bouthiette, certified asthma educator, whose dedication has played a pivotal role in the success of these programs. We wish them continued success in sustaining these services to help children manage their asthma, both in schools and at home, in Manchester.

In addition to these school- and home-based asthma education and control projects, professional development and training is another active arena, this one coordinated by the Southern New Hampshire Adult Health Education Center (SNH AHEC). The most prominent training forum in Manchester appears to be the Lunch & Learn series. The format works well for busy healthcare providers by bringing the training to their workplace in one-hour sessions over their lunch hour. The certified asthma educator who leads the training sessions, Mary Bouthiette, is a dynamic and engaging trainer who relates well to her audience of clinicians.

The trainer also offers to conduct chart audits for clinical practices who have participated in the Lunch & Learn asthma series to identify areas in need of improvement. This would be a natural next step in following the model of evidence-based care that is presented to the practices (shown in Figure 1 above). However, Ms. Bouthiette reports limited participation in chart audits to date, helpful though they might be. Some form of incentive for participating in chart audits and other ongoing efforts to improve asthma care may be needed to help asthma champions remain engaged in practice change.

The importance of spirometry in properly diagnosing and adequately monitoring asthma must be more clearly understood and widely accepted by clinicians. Some clinical practices have reported a lack of access to spirometry, finding the costs prohibitive. Without the use

of spirometry, however, physicians are in danger of misdiagnosing other less common conditions such as cystic fibrosis as asthma. Referral networks or capital campaigns will be needed to ensure that all community health centers in particular (and private clinical practices as well) have access to spirometry for patients who show signs of reduced pulmonary function to ensure the proper diagnosis and monitoring of asthma.

While reviewing the online Asthma Toolbox during the case study, some broken links were discovered that may signal a need to update the AsthmaNow.net website. For example, the link to the National Asthma Training Curriculum in the Office Reference section of the toolkit is no longer valid. When inquiring about the asthma control tests that are supposed to be available for patients to self-administer online, we discovered that the link labeled, "12 yrs and older" did not work, although the link right next to it labeled "4-11 yrs" does refer the browser to the proper webpage.

#### *UPDATING CURRICULA PER REVISED NIH GUIDELINES*

The 2007 release of updated guidelines from NIH presents an opportunity to refresh training participants' knowledge with the latest in scientific advances in the field of asthma management and control. It will be an important service to healthcare providers to disseminate the new recommendations from the EPR-3 NIH Guidelines, especially the expanded models for classifying asthma severity and the stepwise approach to asthma management,. Key portions of the guidelines (e.g., the boxes and figures shown in Appendix A) can be adapted and disseminated to clinical practices such as those who have participated in SNH AHEC trainings on asthma while awaiting the release of a new practical guide for clinicians scheduled for December 2007.

The content of professional development and training on asthma in New Hampshire, such as the Lunch & Learn and Asthma Educator Institute curricula, should be updated based on the new EPR-3 NIH guidelines. Since this is the first comprehensive revision to the guidelines for asthma diagnosis and management in the past ten years, these guidelines contain a wealth of new information based on the latest clinical research. Detailed

guidance on daily controller and quick-acting relief medications, suggestions for asthma education outside the clinical setting, and advice on addressing environmental factors that can exacerbate asthma symptoms are all available in the new EPR-3 NIH guidelines. In addition to updating the information that has been presented in the Lunch & Learn sessions on asthma, a new module for asthma management in children ages five to eleven could also be developed based on the new, expanded guidelines for childhood asthma featured for the first time in the 2007 guidelines from the NIH.

### **Envisioning Success**

We conclude this report with some of the closing comments from the interviews with the NH Asthma Steering Committee. Interviews closed with an invitation to envision the program's ultimate outcomes, encouraging respondents to think creatively about "What would New Hampshire be like if the NH Asthma Control Program were a complete success?" Or, "If this program were wildly successful, what would be different in New Hampshire?" Many of the Steering Committee members responded as visionaries, often sharing one or more of these common themes:

- Community understanding of the nature, causes and treatment of asthma.
- Reduction in medical costs associated with emergency room and hospital stays due to acute asthma episodes.
- Improvements in the clinical treatment and management of asthma, thus improving the quality of life for people living with asthma.
- Improvements in air quality, both indoor and outdoor, to reduce triggers of acute asthma episodes and the incidence of future cases of asthma.

### **Visionary Quotes from Steering Committee Members**

"I see a bunch of things. In schools, kids with asthma have better control. Healthier air for everyone. Health care providers follow clinical guidelines and the current standard of care. Everyone in community understands asthma, knows that anyone can get asthma at any age, and takes personal responsibility not to create environmental triggers."

"Where people across NH are much clearer about the true causes of the increased prevalence of asthma with stronger understanding of the under-recognized connection between obesity, inactivity, and asthma. Programs to combat obesity, improve nutrition and indoor air quality would be integral parts of a healthy communities program."

"The air in NH would be cleaner, so fewer people would suffer from asthma in the first place. NH wouldn't be subjected to emissions from the Midwest. Smoking would be banned. Schools would be healthy and clean."

"All children with asthma would have access to asthma education, which would be reimbursed as part of their healthcare. All would have access (financial and geographic) to the equipment and medicine they need to control their asthma. With better asthma control, we would see fewer emergency department visits and hospitalizations due to asthma."

"I see a revolution in the classroom, redefining what's a clean healthy classroom: no chemicals within reach of children, less clutter, dust and dirt, a place where kids with asthma don't have to worry about being exposed to triggers in the classroom."

"Rates of asthma go down. People with asthma have appropriate medications and know how to use them. Community members understand that asthma is a chronic (rather than episodic) condition and everyone knows how to respond when someone with asthma has trouble breathing."

"Joe Citizen becomes aware of asthma and the program. Reduce asthma rates and the economic and personal burden of asthma. Sustained reductions in hospitalizations and urgent care visits to emergency departments. Fewer missed days from work and school, limitations in activity level of people with asthma. Improved quality of life for people with asthma."

"Everyone would understand asthma. NH would have asthma-friendly, tobacco free environments. Everyone who has asthma would have the knowledge and tools to control it. We would know how to target resources to those most affected by asthma, based on solid epidemiological data on risk factors. Every system would have a real clear sense of what their role is in the prevention and control of asthma. Asthma prevention and control would be well coordinated to engage all involved, minimize overlapping efforts, and maximize outputs and outcomes....[We would] eliminate the disconnect between healthcare providers and those with asthma so that all providers would be knowledgeable about asthma and all patients would have the resources they need to control it."