

December 8, 1998



Health Division



Office of Management and Budget
Executive Office of the President
Washington, DC 20503

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Subject: Proposal for Asthma Disease
Management In Medicaid

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Attached, please find a proposal to encourage the use of disease management to treat pediatric asthma in the Medicaid program. The package includes a \$50 million incentive/start-up grant program focused on states with fee for service based Medicaid programs. The proposal also includes ideas for increasing the use of asthma disease management in Medicaid nationally by distributing and enforcing the use of NIH asthma protocols, and reducing any regulatory barriers that might discourage states' disease management efforts.

→ From our conversations with ASPE and DPC, we understand that HHS is still interested in pursuing its \$50 million discretionary asthma proposals. DPC may be interested in a compromise that includes both disease management and some discretionary funds.

- Tab A:** Proposals for Asthma Disease Management Program In Medicaid
Tab B: Recent New York Time Article on Disease Management (references the treatment of asthma in children)
Tab C: NIH Asthma Treatment Guidelines
Tab D: Virginia's Asthma Disease Management in Medicaid Pilot Evaluation

We asked HHS for the number of Medicaid recipients with pediatric asthma. HHS will attempt to find the number using to NCHS data, and we will provide it as soon as we get it. HHS is also reviewing state fee for service claims data to determine how much information the average state can collect concerning the cost and treatment of children with asthma.

Attachments

Asthma Disease Management Initiative in Medicaid DRAFT FOR DISCUSSION

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There is some evidence that asthma disease management programs in the private sector improve quality of life for asthma patients and reduce asthma related hospitalization and emergency room visits. (Plotcher, 1996) By encouraging the use of asthma disease management techniques in the Medicaid program, we could reduce the incidence of asthma episodes and improve the health of low-income children.

The Medicaid program is an ideal infrastructure through which to implement a low-income children's asthma initiative because:

- a) the Medicaid program targets low-income children;
- b) the Federal government shares in state costs for asthma related care for Medicaid patients, and;
- c) State Medicaid databases may provide demographic and epidemiological data to define the scope of the asthma problem in the state and assist in measuring state-specific outcomes of an asthma initiative.¹

how many low income children have asthma?

only FFS -

what data are we talking about?

What Is Disease Management? Disease management is a new managed care technique designed to improve the care of certain chronic conditions, such as asthma. Disease management organizations are a growing trend in the private health care insurance industry. Revenues of companies who target and treat chronic illness is expected to double over the next year, to \$348 million. (Kilborne, 1998)

Through intensive case management and use of appropriate clinical practices, disease management programs have been shown to improve health outcomes, reduce inpatient hospitalization, lower total costs, and increase consumer and physician knowledge. (Plotcher) Asthma disease management programs in the private sector find reduced hospitalizations and emergency room visits by 50%, and improved functional status as measured by the ability to work and quality of sleep. (Plotcher)

Disease management combines the use of the most up-to-date treatment protocols (or "best practices") with a *prevention component* -- providing disease specific education programs and health screening; an intensive *case management component* -- close monitoring patient care and treatment compliance; and a *self-care component* -- empowering patients to identify symptoms and care for their own chronic disease. (Coons, 1996)

¹ States pursuing disease management in Medicaid in the fee for service environment have been successful in identifying asthma related claims from their Medicaid claims databases.

Asthma Disease Management in Medicaid. Some states (including VA, TX, MS, MD, FL, MN) are embarking on Medicaid disease management programs. (Guiden, 1998) For example, Virginia significantly reduced hospitalizations and emergency room visits in its fee for service disease management pilot simply by identifying Medicaid physicians with asthma patients and providing six hours of training in appropriate asthma treatment. (Rossiter, 1998) Mississippi's new disease management program includes Medicaid payments for pharmacists to provide additional education, case management and drug therapy for patients with asthma. Once approved, Florida's "Invitation to Negotiate" program will contract with outside disease management organizations outside of the existing primary care case management system (PCCM) to provide case management and best clinical practice information. Florida intends to put the disease management organizations "at-risk" for improved patient outcomes, so that the contractors will only be paid out of savings from reduced asthma related hospitalizations and emergency visits.

Barriers to Implementing Asthma Disease Management in Medicaid. While a documented success in the private sector, there are some barriers to implementing disease management in Medicaid. While savings may eventually result from decreased emergency room visits and hospitalization rates for chronically ill individuals, disease management may increase "up-front" costs by requiring physician and patient education and more intensive case management efforts. For example, appropriate asthma clinical protocols in Virginia's program increased benefit costs by increased use of inhalers and more frequent visits with a case manager to ensure patient compliance with treatment. (Rossiter)

Other barriers to implementing Medicaid disease management include the high cost of contracting with disease management organizations, lack of adequate data systems to identify and track individual patients (particularly managed care encounter data), and lack of documentation about disease management's effect on health outcomes and program savings. (Pinney, 1998) Medicaid MCOs may be reluctant to invest in disease management services for Medicaid patients because of the high caseload turnover. (Guiden)

The following paper proposes a range of policies that will assist and encourage states to explore the use of disease management techniques to focus on and improve health outcomes of low-income children with asthma.

Proposal for an Asthma Disease Management Demonstration

Summary. HHS would conduct a demonstration to test the use of innovative asthma disease management techniques for children enrolled in the Medicaid program. HHS would provide \$50 million for competitive start-up grants to states who submit disease management programs to identify and treat asthmatic children with the most appropriate care. Participating states would be required to measure the success of the program in averting asthma related medical crisis -- such as the number of hospital stays or an emergency room visits. States would be encouraged to track other quality of life measures -- such as missed school days from asthma related illness.

Scope. Grants would be available for a minimum of 10 states. Programs can be statewide, or could target areas of the state with high asthma incidence among Medicaid beneficiaries. Grant funds would be available for new or expanded disease management efforts only. State with asthma disease management programs in place would be required to maintain their current efforts in order to access grant funds for a program expansion. Waivers may be required if states implement mandatory enrollment.

Financing. To assist states with the start-up costs of the demonstration, \$50 million in mandatory Medicaid funds would be made available to the Secretary of HHS in FY2000. Alternative proposals include:

Alternative Option A. Withhold \$20 million in grant funds for distribution once participating states establish a asthma baseline approved by HCFA.

Alternative Option B. Withhold \$10 million in grant funds as a reward for states who have reached certain level of improvement against their asthma baseline.

Proposal Requirements. To qualify for the grant funds, states would be required to submit a proposal that includes the following:

- *Asthma Treatment Baseline.* Participating states would be required to establish a "current practices" asthma baseline from existing Medicaid data against which it can measure the success of the disease management intervention. States should plan to provide HCFA with quarterly and yearly outcome measurements against the baseline. The baseline should track, at a minimum,
 - number of Medicaid eligible children with asthma in the area of the demonstration
 - number and cost of asthma related office visits, *can Medicaid measure this?*
 - number and cost of hospital stays and emergency room visits from asthma-related incidents.
 - other quality of life factors for which the state can produce a baseline, such as missed school days and beneficiary compliance with treatments.

- *Appropriate Care Protocols.* States would develop, or contract with a disease management organization to develop, an intervention model that includes appropriate disease treatment protocols (i.e. clinical pathways or best practices). The protocols should be consistent with NIH's recent asthma treatment guidelines.
- *Patient and Physician Outreach and Education.* The proposal should include a plan for the dissemination of asthma treatment guidelines to Medicaid physicians. Plans should include a beneficiary education component that focuses on self-care -- such as ways to avoid attacks, and the proper use of inhalers.
- *Leveraging Medicaid Funds.* Grant funds are targeted for start-up costs, not to offset the state share of traditional Medicaid benefits. States are encouraged to design programs so that outreach, case management and benefit and treatment costs are claimable under the current law Medicaid program (or through a waiver or state plan amendment). For example, states may use grant funds to evaluate asthma data to construct a baseline or evaluation. States may not use the grant funds to offset state match for increased pharmaceutical expenditures under the demonstration.
- *Partnerships.* States who partner with pharmaceutical companies, physicians, pharmacists in designing the demonstration will be favorably considered.
- *Concentrate Grant Awards for Fee For Service Programs.* Grant awards would be targeted to disease management proposals in Medicaid fee-for-service, or managed care carve-out programs. [We do not recommend providing incentive grant funds for states to pass-through to Medicaid managed care organizations. Based on our conversations with states implementing disease management in Medicaid, managed care encounter data is often insufficient to establish a baseline. The state and federal government would not share in the savings achieved by MCOs, so it may not be an appropriate place to provide start-up cost assistance. (See managed care options below).]

but almost everyone is going MC3

Proposal for National Asthma Treatment Strategies.

In addition to the state-specific focus, we recommend the following initiatives to improve the treatment of asthma in Medicaid programs nationwide:

1) *Asthma Disease Management Guidelines.* Similar to the AIDS treatment guidelines issued last year, HHS will issue a State Medicaid Director's letter to encourage the use of asthma best practice guidelines as issued by NIH and private sector organizations. (See attached.)

2) *AHCPR Asthma User Liaison Program.* AHCPR will work with HHS to identify and provide states with "best practices" in asthma disease management. AHCPR will disseminate this information by designing a User Liaison Program (ULP) for asthma disease management, which will train state and local governments in the understanding and use of asthma disease management guidelines. *explain.*

3) *Identifying and Eliminating Federal Barriers.* To remove any unnecessary roadblocks to the use of best practices in asthma treatment, HHS will review and wherever possible, reduce any federal barriers that might exist in HHS regulations, or state Medicaid manual. HHS will report to the Secretary in one year with its recommendations.

HHS will also review current Medicaid law and provide states with guidance as to what waivers of law or changes in state plan amendments are required in order for states to implement certain disease management techniques in Medicaid -- such as physician education programs or additional case management from non-traditional providers, such as pharmacists.

4) *Improving Asthma Treatment within Medicaid Managed Care.* As the incidence of asthma grows predominantly in low-income populations, it is important that Medicaid providers provide the highest quality care based on HHS guidelines:

- Through their contracts with managed care organizations, HCFA and the States should ensure that all providers who serve the Medicaid population are aware of and adhere to these guidelines.
- HHS could increase awareness about disease management techniques by requiring states to report on their MCOs disease management efforts as part of the 1915b managed care waiver process, or as part of the managed care contract between the state and the MCO.
- HCFA could require that states collect data on the care provided to asthma patients in MCOs. (This could also be required of FFS states not participating in the demonstration.)

5) *Evaluation and Technical Assistance Funding.* States might benefit from the experience of existing disease management programs in pioneering states such as Virginia Florida and

Mississippi. HHS would evaluate existing Medicaid disease management programs and submit a report to OMB. The evaluation would be jointly performed and funded by HCFA and ASPE.

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Paul Wynn, "The Role of Physicians in Disease Management"; *Managed Care Magazine*, October 1996.

▶ **Jeffrey A. Farkas**

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cc:

Subject: NY Times Item on Disease Management

December 7, 1998

Moving Beyond Cost-Cutting, H.M.O.'s
Look to Manage Chronic

Related Articles
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Forum
Join a Discussion on Health Care Reform

By PETER T. KILBORN

EST CHESTER, Pa. -- Nick Polidore, a state gymnastics champion with bangs, dimples and baggy blue jeans, would seem as robust as any other 11-year-old. But he has asthma, so ragweed or a simple cold can propel him to an emergency room, gasping for breath.

Once, an asthma attack would keep him in a hospital for a day or two. But since his family doctor here, Brandt S. Loev, took up disease management, a system for controlling chronic conditions like asthma, the big emergencies have stopped -- and so have the big bills to his mother's health insurance company.

Disease management sounds familiar, even common-sensical. On each office visit, Loev checks Nick's breathing and health completely and then an aide teaches him how to avoid attacks, how to use inhalers, how to test his lungs himself with a simple bedside device the clinic gave him.

Once upon a time, this is what managed care was supposed to do: cut costs by keeping people healthy. Instead, health management organizations and insurance companies concentrated on cutting costs, especially by reducing doctors' fees.

But now that those methods have played out and in many cases profits evaporated, some health care organizations are looking to better medical practice as an answer. The new remedy is managing chronic diseases,

which account for 60 percent of medical costs in the United States.

"The next phase has to be managing care better and disease management is another word for that," said Uwe S. Reinhardt, a health care economist at Princeton University.

The movement is breeding as many as 300 companies that contract with health maintenance organizations and employers to supervise the care of people with chronic diseases. The revenue of these companies is expected to double over the next year, to \$348 million, said Al Lewis, a broker who negotiates contracts for the companies with health maintenance organizations.

Among the 1,000 HMOs that belong to the American Association of Health Plans, at least 150 are collaborating with the American Diabetes Association in a 10-year disease management program that aims to reduce blindness and foot amputations among diabetics by 40 percent and kidney failure by 30 percent.

One leader in the movement is the University of Pennsylvania Health Center, which offers management programs for 20 chronic conditions through its 85 clinics in and around Philadelphia, including Loev's clinic in West Chester. In September, it licensed VHA Inc., a group of more than 1,200 nonprofit hospitals, including Columbia Presbyterian in New York, to use its programs.

"Everybody's talking about it," said Dr. Joseph Carver, disease management medical director for Aetna U.S. Healthcare, which has enrolled nearly 59,000 members in programs that include those for managing congestive heart failure and low back pain. "Everybody says they're doing it."

But disease management is still a small part of health care, and it is not clear whether it will gain wide acceptance among doctors, some of whom belittle it as "cookbook medicine." They see their control of health care threatened, in part by lower-paid technicians, or disease managers, typically nurses with advanced training.

Consumer advocates warn that disease management can be abused, most obviously by HMOs and the disease management companies that are thriving by taking on chronic conditions like asthma that promise quick savings while shunning those like hypertension that can take a decade or more to yield savings.

"I see a lot of enthusiasm for this as a way of solving some serious problems," said John M. Eisenberg, administrator of the Federal Agency for Health Care Policy and Research and a proponent of disease management. "What we all have to be worried about is whether the emperor has any clothes."

Scholars like Reinhardt say the University of Pennsylvania's 2-year-old program is promising. Disease management permeates the university's Mayfair Family Practice in northeast Philadelphia, which serves an aging population of patients, many with multiple ailments, in a blue-collar

neighborhood.

"I would say 90 percent of the people who come in here have some form of chronic disease," said Winifred Waters, the nurse-manager. "We have a lot of nuns who are on Medicare, and every nun has severe osteoporosis."

For 18 years she and her husband, Dr. Patrick T. Waters, a family practitioner, operated the clinic alone. Like most health professionals, they kept abreast of advances in care by reading medical journals and attending conferences. But as managed care spread and cut their fees, their income plunged. They had to see more patients, faster, which left little time for comprehensive treatment of chronic diseases.

Four years ago, they sold the practice to the University of Pennsylvania Health System and became salaried employees, with two younger doctors. Early last year, they began working under the system's disease management guidelines, or protocols.

As an example of how the arrangement works, Waters said, he pointed to a package of a medication, Niaspran, a new prescription drug to lower cholesterol, which a drug company's salesman had left as a sample.

Niaspran is a form of niacin, which is sold over the counter, and is released over an extended time in the body. Niacin can cause severe flushing, making people feel hot and reddening their faces. The salesman said Niaspran had less severe side effects.

In his own practice, Waters said, he would not have prescribed Niaspran until he had enough research to support its use. But he e-mailed a University of Pennsylvania expert on the management of high cholesterol, Dr. Dan Rader, asking him about the drug.

Rader checked with the Food and Drug Administration, which endorsed it, and so Rader then added it to the university's one-page protocol for niacin therapy.

But the biggest change brought by disease management, Waters said, is the advent of the university's circuit-riding nurse educators, each specializing in specific diseases.

On a recent Thursday, five older patients were in the clinic's kitchen for a noon class on diabetes, instructed by Patricia Bourne, diabetes educator and disease manager.

Bourne conducts these classes and individual counseling sessions with new patients and those who need special attention. Patients can call her for help, and every month or two, University of Pennsylvania nurses call patients. If a nurse detects a problem, she calls in Bourne.

"This is very new," one patient, Audrey Grubman, said. "I met with Pat on a one-to-one basis in June and July. My doctor told me a lot of these things, but she reinforces it. She keeps it in front of your mind to take better care of yourself."

Waters says Bourne is a boon to him, too. He still sees patients in quick, 10- and 15-minute visits. "But this allows me to do more of what I'm best at doing," he said. It also pays. Waters' bonus depends in part on holding down his patients' need for surgery and emergency treatment of heart attacks and strokes.

The secret to both improving health and reducing costs, says Dr. David S. Shulkin, the University of Pennsylvania's health system medical director, lies in making good medicine, not cutting costs, the priority. "We're implementing best practices," he said, "and letting the economics sort itself out."

So far, disease management seems to work. Shulkin said that of 1,547 university patients with hypertension, only 19 percent had blood pressure readings at or below 140/90 when they enrolled in the program, but 53 percent achieved those levels afterward. Of 1,497 with adult diabetes, 40 percent had safe levels of blood sugar before enrollment; afterward, the figure was 60 percent.

Some management programs that affect large numbers of people, like one for high cholesterol, can cost more to operate than they save. "But when you balance out the winners and losers," Shulkin said, "it turns out to be a significant cost-saver overall."

Pediatric asthma care seems to be a winner at the university's West Chester clinic. Before Loev examined Nick Polidore, the resident disease management coordinator and patient educator, Wendy York, retrieved the boy's chart. It had a blue dot for asthma pasted on it, which told her to collect specialized forms to guide Loev through his examination. The forms leave little to chance or intuition.

"We have a protocol," Loev said, "so we're consistent in treating all patients all the same way."

Then York takes over. "I'd like to get a pulmonary function," she tells Nick. Wiry, weighing about 80 pounds, Nick is a little lethargic three days after a mild attack. He stands, takes a deep breath and blows into a spirometer. His reading is a little worse than his best.

York counsels him, as she does on each visit, in using inhalers, nebulizers and bronchodilators and in giving himself emergency epinephrine shots to open breathing passages. She has him show her how he blows into a peak flow meter, a plastic pipe that measures his breathing.

"If you do a peak flow," said his mother, Sharon Polidore, "you can see if you're not getting enough air in."

Nick has mastered his part in managing his disease. "He's a classic case," Loev said. "Our emergency room costs are lower. Our hospital costs are lower. Our specialist costs are lower. The patient is much more in control. And the patient who comes in isn't as sick."

EXPERT PANEL REPORT 2

CLINICAL PRACTICE
GUIDELINES

Guidelines for the Diagnosis and Management of Asthma

NIH PUBLICATION

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OF HEALTH*

*National Heart, Lung,
and Blood Institute*

ABSTRACTS

of Clinical Care Guidelines

Volume 9 / Number 7

A Joint Commission Newsletter

July / August 1997

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Guidelines for the Diagnosis and Management of Asthma

National Asthma Education and Prevention Program, National Heart, Lung, and Blood Institute: Guidelines for the Diagnosis and Management of Asthma. Expert Panel Report II. Pub No. 97-4051. Bethesda, MD: National Institutes of Health, 1997.

Despite scientific advances in understanding and treating asthma, the rates of asthma death, hospitalization, and morbidity have increased or remained stable over the past 10 years. To help bridge the gap between current knowledge and practice, the National Asthma Education and Prevention Program (NAEPP) of the National Heart, Lung, and Blood Institute (NHLBI) has convened two expert panels to prepare guidelines. In 1991 the first panel released guidelines with recommendations grouped around four components: objective measures to assess severity and monitor therapy; environmental control measures; comprehensive pharmacologic therapy, and patient education. Additional reports by international asthma experts in cooperation with NHLBI followed in 1992 and 1995. A Science Base Committee monitoring the scientific literature since 1994 notified the NAEPP that sufficient new information had been published to warrant developing an update of the 1991 report.*

The comprehensive report offers clinicians working in diverse health care settings recommendations on practical decision-making issues in asthma diagnosis and management and specific aids to facilitate implementation of the recommendations. Each section begins with a list of key points and a list of differences from the 1991 report and concludes with an alphabetized list of references. A total of 36 fig-

*The 19-member multidisciplinary panel, chaired by Shirley Murphy, MD, of the Department of Pediatrics at the University of New Mexico School of Medicine (Albuquerque), included clinicians and scientists representing general medicine, family practice, pediatrics, emergency medicine, allergy, pulmonary medicine, nursing, pharmacy, and health education, and it included federal liaison representatives (Centers for Disease Control and Prevention, Agency for Health Care Policy and Research, Center for Primary Care Research, National Institute for Occupational Safety and Health Division of Respiratory Disease). The project was entirely funded by NHLBI; panel members and reviewers served as volunteers. The NHLBI asthma reports are:

- National Asthma Education Program: National Heart, Lung, and Blood Institute: Guidelines for the Diagnosis and Management of Asthma. NIH Pub No. 91-3042. Bethesda, MD, 1991.
- National Heart, Lung, and Blood Institute: International Consensus Report on Diagnosis and Management of Asthma. NIH Pub. No. 92-3091. Bethesda, MD, 1992.
- National Heart, Lung, and Blood Institute and World Health Organization: Global Initiative for Asthma. NIH Pub No. 95-3639. Bethesda, MD, 1995.

(continued on page 3)

Guidelines for the Diagnosis and Management of Asthma (continued)

Table 1. Classification of Asthma Severity, by Clinical Features Before Treatment*

Severity Class	Clinical Features Before Treatment		
	Symptoms	Nighttime Symptoms	Lung Function
Step 4 Severe Persistent	Continual symptoms Limited physical activity Frequent exacerbations	Frequent	FEV ₁ /PEF ≤ 80% predicted PEF variability > 30%
Step 3 Moderate Persistent	Daily symptoms Daily use of inhaled short-acting beta ₂ -agonist Exacerbations affect activity Exacerbations ≥ 2 times/wk may last days	> 1 time/wk	FEV ₁ /PEF > 80% < 80% predicted PEF variability > 30%
Step 2 Mild Persistent	Symptoms > 2 times/wk but < 1 time/d Exacerbations may affect activity	> 2 times/mo	FEV ₁ /PEF ≥ 80% predicted PEF variability 20%-30%
Step 1 Mild Inter- mittent	Symptoms ≤ 2 times/wk Asymptomatic and normal PEF between exacerbations Exacerbations brief (from a few hours to a few days); intensity may vary	≤ 2 times/mo	FEV ₁ /PEF ≥ 80% predicted PEF variability < 20%

*Ed note: This table is slightly adapted from the original, Figure 1-3. The presence of one of the features of severity is sufficient to place a patient in the severity category. An individual should be assigned to the most severe grade in which any feature occurs. The characteristics noted are general and may overlap because asthma is highly variable. Furthermore, an individual's classification may change over time. Patients at any level of severity can have mild, moderate, or severe exacerbations. Some patients with intermittent asthma experience severe and life-threatening exacerbations separated by long periods of normal lung function and no symptoms.

Clinical care guidelines are statements of professionally appropriate care processes that have been derived from either empirical research or professional consensus. They are not outcome indicators but can be used as tools in peer review of individual cases of adverse outcome, for evaluating the appropriateness of surgery or other invasive procedures, to assist in developing process indicators of quality for monitoring and evaluation activities, and as benchmarks for reviewing the appropriateness of the use of ancillary services.

The primary purpose of *Abstracts of Clinical Care Guidelines* is to assist in the dissemination of clinical care guidelines. The Joint Commission on Accreditation of Healthcare Organizations does not endorse the guidelines or the approaches to guideline development and evaluation described in *Abstracts*. Medical specialty groups and other health professional associations are invited to submit guidelines for consideration. All abstracts have been reviewed for appropriateness and accuracy and are usually accompanied by expert peer commentary. Readers are strongly urged to consult the full sets of all guidelines, articles, and reports.

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Guidelines for the Diagnosis and Management of Asthma (continued)

Table 2. Overview of the Medications

Long-Term-Control Medications

- **Corticosteroids:** Most potent and effective anti-inflammatory medication currently available. Inhaled form is used in the long-term control of asthma. Systemic corticosteroids are often used to gain prompt control of the disease when initiating long-term therapy.
- **Cromolyn sodium and nedocromil:** Mild-to-moderate anti-inflammatory medications. May be used as initial choice for long-term-control therapy for children. Can also be used as preventive treatment prior to exercise or unavoidable exposure to known allergens.
- **Long-acting beta₂-agonists:** Long-acting bronchodilator used concomitantly with anti-inflammatory medications for long-term control of symptoms, especially nocturnal symptoms. Also prevents exercise-induced bronchospasm (EIB).
- **Methylxanthines:** Sustained-release theophylline is a mild-to-moderate bronchodilator used principally as adjuvant to inhaled corticosteroids for prevention of nocturnal asthma symptoms. May have mild anti-inflammatory effect.
- **Leukotriene modifiers:** Zafirlukast, a leukotriene receptor antagonist, or zileuton, a 5-lipoxygenase inhibitor, may be considered an alternative therapy to low doses of inhaled corticosteroids or cromolyn or nedocromil for patients ≥ 12 years of age with mild persistent asthma, although further clinical experience and study are needed to establish their roles in asthma therapy.

Quick-Relief Medications

- **Short-acting beta₂-agonists:** Therapy of choice for relief of acute symptoms and prevention of EIB.
- **Anticholinergics:** Ipratropium bromide may provide some additive benefit to inhaled beta₂-agonists in severe exacerbations. May be an alternative bronchodilator for patients who do not tolerate inhaled beta₂-agonists.
- **Systemic corticosteroids:** Used for moderate-to-severe exacerbations to speed recovery and prevent recurrence of exacerbations.

ures and 7 text boxes provide quick access to technical information and illustrations* (eg, Tables 1 and 2).

Asthma is now defined as a chronic inflammatory disorder of the airways in which many cells and cellular elements play a role, in particular, mast cells, eosinophils, T lymphocytes, neutrophils, and epithelial cells. In susceptible individuals, this inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and cough, particularly at night and in the early morning. These episodes are usually associated with widespread but variable airflow obstruction that is often reversible either spontaneously or with treatment. The inflammation also causes an associated increase in the existing bronchial hyperresponsiveness to a variety of stimuli. This definition is still in process, with recent evidence indicating that subbasement membrane fibrosis may occur in some patients with asthma and that these changes contribute to persistent abnormalities in lung function.

Component 1: Measures of assessment and monitoring. Making the correct diagnosis is extremely important, requiring clinical judgment because signs and symptoms vary widely from patient to patient as well as within each patient over time. The clinician must determine that episodic symptoms of airflow obstruction are present, airflow obstruction is at least partially reversible, and alternative diagnoses are excluded. The initial assessment section differs from the 1991 guidelines in several ways:

- Severity classifications were changed from mild, mod-

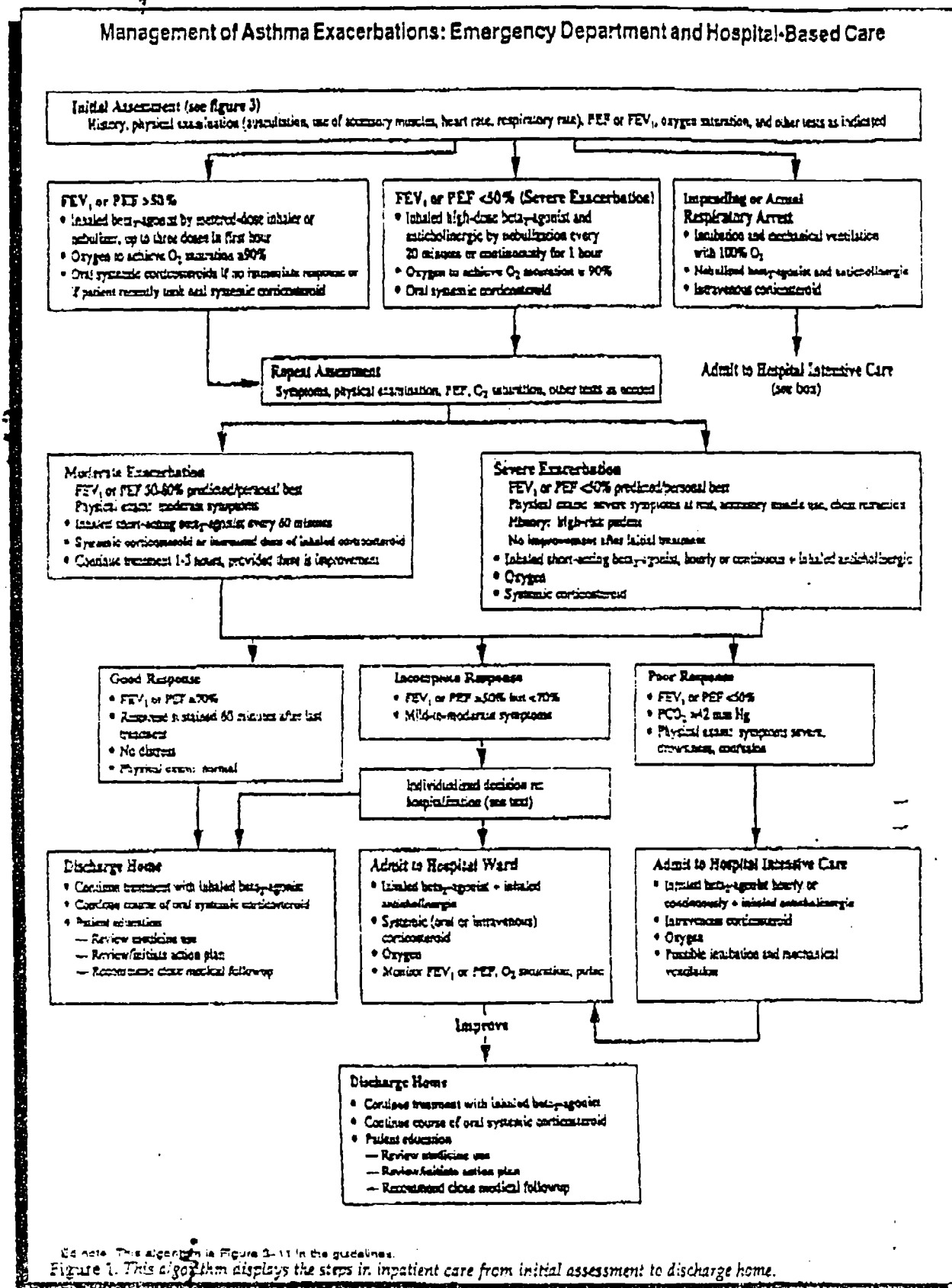
erate, and severe to *mild intermittent*, *mild persistent*, *moderate persistent*, and *severe persistent* (see Table 1).

- Examples of questions to use for diagnosis and initial assessment of asthma were added.
- Information on wheezing in infancy and vocal cord dysfunction was expanded in the differential diagnosis section.
- Criteria for referral were refined with input from specialty and primary care physicians.
- More specific recommendations for measuring peak expiratory flow (PEF) diurnal variation are made. The periodic assessment and monitoring section differs also:
 - A goal of therapy has been added: Meet patients' and families' expectations of and satisfaction with asthma care.
 - Periodic assessment of six domains of patient health corresponding with asthma therapy goals is now recommended: signs and symptoms, pulmonary function, quality of life, history of exacerbations, pharmacotherapy, and patient-provider communication and patient satisfaction.
 - Changes affecting peak flow monitoring have been made: change from twice daily to morning (if morning reading is less than 80% of personal best PEF, consider monitoring more often); addition of discussion of inconsistencies among peak flow meters; and strong emphasis on use of the individual patient's best PEF.

Component 2: Control of factors contributing to asthma severity. Substantially reducing sensitive patients' exposures to inhalant allergens will decrease airway inflammation, airway hyperresponsiveness, asthma symptoms, need for medication, and death from asthma. Changes

*The methods of review, analysis, consensus process, and draft and revision are provided in detail with the guidelines. Given the complexities of several issues, the panel chose not to use the strict evidence-ranking system of the U.S. Preventive Services Task Force except in the area of peak flow monitoring.

Guidelines for the Diagnosis and Management of Asthma (continued)



Guidelines for the Diagnosis and Management of Asthma (continued)

Key Educational Messages for Patients

Check off or document that the following key messages have been covered:

Basic Facts About Asthma

- ☐ The contrast between asthmatic and normal airways
- ☐ What happens to the airways in an asthma attack

Roles of Medications

- ☐ How medications work
 - Long-term control: medications that prevent symptoms, often by reducing inflammation
 - Quick relief: short-acting bronchodilator relaxes muscles around airways
- ☐ Stress the importance of long-term-control medications and not to expect quick relief from them

Skills

- ☐ Inhaler use (patient demonstrate)
- ☐ Spacer/holding chamber use
- ☐ Symptom monitoring, peak flow monitoring, and recognizing early signs of deterioration

Environmental Control Measures

- ☐ Identifying and avoiding environmental precipitants or exposures

When and How To Take Rescue Actions

- ☐ Responding to changes in asthma severity (daily self-management plan and action plan)

Ed Note: This is Figure 4-1 in the guidelines.

Figure 2. This check sheet helps clinicians keep track of topics covered in education of their patients.

from the 1991 report include a specific recommendation of skin testing or in vitro testing for patients with persistent asthma exposed to perennial indoor allergen; aspirin forbidden only for those sensitive to aspirin or with severe persistent asthma; and annual influenza vaccinations recommended for patients with persistent asthma.

Component 3: Pharmacologic therapy. As in the 1991 report, a stepwise approach is recommended with the type and amount of medication dictated by asthma severity, and again long-term, anti-inflammatory therapy for persistent asthma is emphasized (see overview in Table 2). Algorithms and other figures display management in home, ED (see Figure 1), and other settings. Key differences from the 1991 report are categorization of medications into two general classes: long-term control and quick relief; new medications for long-term control and prevention (long-acting inhaled beta₂-agonists, nedocromil, zafirlukast, zileuton); increased understanding of inhaled corticosteroids and their significant role in asthma therapy (clinical comparability of different preparations is estimated); emphasis in the stepwise approach on initiating higher-level therapy at the onset to establish prompt control and then stepping down; and addition of a new section on asthma in infants and young children.

Component 4: Education for a partnership in asthma care. Again stressing providers' use of every chance to educate patients and families in self-management, the guidelines add the following:

- Emphasis is on patient education by the principal clinician as well as other members of the health care team (see Figure 2).
- Charts set out detailed questions to elicit information and educational messages for each visit.
- Additional emphasis is placed on evaluating out-

comes in terms of patient perceptions of improvement, especially quality of life and the ability to engage in desired activities.

- Roles of written materials and formal education programs are clarified with emphasis that they can supplement but not replace education by clinicians (sources are provided).
- Renewed emphasis is placed on providing patients with both a written treatment plan for daily self-management and a written action plan for management of exacerbations (with examples applicable to both children and adults).
- A new section on assessing and responding to cultural and language differences was added. --
- A new section on patient education for non-CFC (chlorofluorocarbon) inhalers (given international banning of CFCs) was added.

Commentary 1—From the Guideline Developer's Perspective: The new guidelines for the diagnosis and management of asthma released this year by the NAEPP constitute the final result of a multidisciplinary effort to summarize our current knowledge of the treatment of this complex disease. One way the new guidelines significantly revised the previous (1991) version has to do with the treatment of asthma in children. For the first time, the guidelines acknowledge the fact that in this age group, wheezing and other signs and symptoms of bronchial obstruction may be due to a spectrum of related but different conditions.

This is a particularly significant problem in early childhood, a time during which many children present with wheezing, but most lose their symptoms late in life. It was thus important, in the context of a document that defines asthma as a chronic inflammatory disease of the airways, to stress the need for caution in the chronic use of inhaled steroids in children 5 years of age and younger. This is certainly a complex matter because there is little doubt that most cases

(continued on page 6)

Guidelines for the Diagnosis and Management of Asthma (continued)

of asthma occurring at any age present for the first time with symptoms of airway obstruction during the first years of life. It is thus likely that in terms of its potential long-term action, anti-inflammatory therapy may be most effective when started at a time in which the disease is at its first stages of development. The true dilemma is: Should we treat with anti-inflammatory therapy all young children who wheeze irrespective of their potential prognosis, thus overtreating some children who probably do not have the need for chronic anti-inflammatory therapy? Or should we try instead to identify children at high risk of having asthma, thus running the risk of not treating aggressively enough some young children who may have asthma but who cannot be identified with the diagnostic tools currently available?

In my opinion, this issue is solved in the guidelines in the best possible way given our current knowledge of the matter. There is little doubt that severity of symptoms is a risk factor for persistent disease, and the guidelines are very clear in suggesting that children aged less than 5 should be treated with inhaled corticosteroids as long-term control medication if they have severe-persistent or even moderate-persistent disease. But markers of prognosis of asthma in early life are very rudimentary, and much more work needs to be done in this area.

The problems that the National Asthma Expert Panel had in approaching issues like the treatment of asthma-like symptoms in children aged 4 or less are indicative of both the strength and the limitations of this type of panel in developing meaningful treatment guidelines. There is little doubt that the final product is the best result that can be obtained using a methodology that is substantially based on consensus among a group of experts in the field. Unfortunately, many times such a group of experts find themselves without solid evidence to support some of the recommendations contained in these documents simply because no such evidence has been reported in the literature. Some recommendations are thus based on opinions, which can certainly be disputed by persons with different opinions. It appears clear that in the future, evidence-based models will need to be developed. These evidence-based models are certainly not a panacea to solve the problems described above. In fact, these models are also paradigm based, and paradigms are, in the final analysis, the result of the consensus regarding disease causation that exists in the scientific community at a certain time. However, evidence-based models allow us to determine more precisely the exact limitations of our knowledge. To this extent, they also allow us to define the areas that require further scientific elucidation.

Fernando D. Martinez, MD, Professor of Pediatrics and Director, Respiratory Sciences Center, Tucson, Arizona

Commentary 2: The NAEP's Expert Panel Report II is now available six years after the first expert panel report was released in 1991. The 1991 report was widely distributed among general practitioners and specialists as well as allied health personnel. Six years of advances in basic and clinical research on asthma has made updating previous recommendations necessary. Despite the progress in knowl-

edge about asthma, mortality continues to rise in certain segments of the population, making the dissemination of timely and comprehensive guidelines important. The new report is well written, exhaustively researched, and very comprehensive. The long hours spent by the panel are evident in the amount of information and materials included in this update.

Another asthma guideline produced in the past decade is the Practice Parameters of Diagnosis and Treatment of Asthma, developed by a joint task force of the American Academy of Allergy, Asthma and Immunology and the American College of Allergy, Asthma and Immunology.¹ When compared with the Expert Panel Report, these practice parameters are geared more for the practicing specialist, while the expert panel report targets the general practitioner. These practice parameters have summary statements that are helpful for quick reference and include topics such as severe intractable asthma, developing crisis plans for fatality-prone asthmatics, and food hypersensitivity in asthma, which are geared to the specialist.

The new panel report has incorporated the idea of summary statements into their document with "Key Points" at the start of most sections. They are simple statements of points to be emphasized and represent an improvement over the old format. The expanded sections on the inflammatory component of asthma are informative. The increasing evidence of the role of airway remodeling in chronic asthma is also noted. The new classification of asthma severity in the stepwise approach separates mild intermittent from mild persistent asthma, emphasizing anti-inflammatory therapy for the latter category.

The inclusion of anti-leukotriene agents is a useful update, although recent data would support an expanded role in the treatment of asthma in the higher categories of severity. New antileukotrienes should become available soon with additional studies supporting their expanded role.

The sample questions provided for history taking is quite detailed and will be very useful in assessing the nature and severity of asthma as well as response to therapy. Perhaps this section might fit better in an "addendum."

The section on criteria for specialist referral is a reiteration of the recommendations from the Task Force on Practice Parameters and is an important addition to the Panel Report. The emphasis on the option to start with higher-level therapy in patients with exacerbation and then stepping down to lower levels reflects most physicians' clinical experience and is a practical alternative to the step-up approach.

From the allergist's perspective, the section on allergy in asthma is extensive and a good reference for primary care clinicians. The new, more specific recommendation for skin testing in at least the patients with persistent asthma and exposure to perennial indoor allergens is very appropriate and long overdue. The sample questions on environmental factors, especially allergen-related ones, are very helpful. The section on immunotherapy has also been expanded and improved. Discussion of tartrazine sensitivity (not supported by newer research) and recommendations for routine use of chemicals for dust mites have been removed, reflecting up-to-date allergy research.

Differences from the 1991 report are listed at the start of most sections and should alert the reader to new changes.

Guidelines for the Diagnosis and Management of Asthma (continued)

However, some recommendations appear to have been changed or deleted with no note in the list of differences from the 1991 report. For example, theophylline is no longer recommended for emergency room treatment in the new report. Some minor points that caught our attention include the recommendation for twice daily peak flow monitoring in the hospital discharge guidelines, while only morning peak flow monitoring is recommended elsewhere in the report. Another point is the removal of pneumococcal vaccination from the recommendations with no explanation offered. Pneumococcal vaccination is still important especially in asthmatics with other chronic diseases.

The table of estimated comparative daily dosages of the inhaled steroids is based mainly on indirect data such as relative topical potency, bioavailability, and studies of relative doses producing similar effects. These data only highlight the fact that studies directly comparing the clinical potency versus the side effects of the inhaled corticosteroids on a microgram per microgram basis are still lacking. Such studies would provide a truly scientific basis for determination of the relative clinical potencies of the various inhaled steroids.

Overall, this report is an excellent and comprehensive guide for clinicians who deal with asthma. The changes reflect the major advances in asthma research and incorporate them in clear and easy-to-follow guidelines. Although studies show that there is room for improvement in the acceptance and use of published guidelines by primary care physicians, there is clearly a need for essential information presented in an accessible and easy-to-use manner. It is to be hoped that guidelines and practice parameters will be more widely accepted and used by specialists and primary care practitioners, leading to the prevention of unnecessary complications and deaths from asthma as we approach the new millennium.

References:

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2. Gorton TA, Cranford CO, Golden WE, Walls RC, Pawelak JE. Primary care physicians' response to dissemination of practice guidelines. *Arch Fam Med* 4:433-42, 1995.

Richard A. Tan, MD, Research Physician, Allergy Research Foundation, Los Angeles, and Sheldon L. Spector, MD, Clinical Professor, Department of Medicine, UCLA School of Medicine, and Director, Allergy Research

Commentary 3—From a Guideline User's Perspective: Methodist Hospital is Indiana's largest, not-for-profit teaching hospital with approximately 45,000 admissions per year, and it is dedicated to providing the highest level of health care to patients and families. The Children's Hospital is a hospital within a hospital with 4,100 admissions yearly (excluding neonatal infant care unit and newborn nursery). The Children's Hospital is a community-based program with primary care physicians and subspecialists collaborating to care for children with a wide variety of diagnoses. Pediatric asthma is the single, highest volume admitting diagnostic group to the Children's Hospital. Because of the large number of patients seen and the rising morbidity and mortality associated with the pediatric asthma, it has been the focus of

multiple quality improvement efforts over the past four years.

At the Children's Hospital, the first initiative to implement the 1991 Expert Panel Report (EPR-I) asthma guidelines was in the Emergency Medicine and Trauma Center (EMTC). In 1993, a team of physicians, nurses, and respiratory therapists from the EMTC and the inpatient pediatric units formed to examine how closely our Emergency Department care followed the guidelines. A focused chart review revealed that in 1993 only 20% of children (> 5 years) had peak flow monitoring done and 40% of children had appropriate dosing and sequencing of Albuterol updrafts within the first hour of care. Variation in care was greater than expected, in part because of the size of the ED and the large number of interns and residents who rotate through the area. When aggregate data were presented demonstrating this variation, the team sought to integrate the guidelines into daily practice in a user-friendly way.

The asthma team adapted the guidelines for the emergency management of pediatric asthma by developing an algorithm and delineating the essential management steps. With consistent re-evaluation and fine-tuning, the peak flow monitoring rate for children with asthma in the ED is now 95% and appropriate dosing and sequencing of Albuterol updrafts in the first hour of care is 98%.

The 1997 version of the guidelines has demonstrated the evolution in our understanding of the underlying pathophysiology and management of asthma. This update builds on the 1991 guidelines, the *International Consensus Report on the Diagnosis and Management of Asthma* (NHLBI 1992), and the *Global Initiative for Asthma* (NHLBI/WHO 1993).

One of the most important enhancements in the EPR-II is the recognition of the role of inflammation early on in the disease process and the emphasis on early and aggressive treatment of symptoms. The EPR-I is recommended starting our slowly with pharmacological management and adding to the regimen if and when the patient failed to improve. The current report emphasizes starting at a higher level of therapy to establish prompt control and then stepping down to a maintenance level.

Asthma classification is more descriptive and includes the categories mild intermittent, mild persistent, moderate persistent, and severe persistent asthma. What will be especially useful for clinicians is the description of signs and symptoms found in each of these categories prior to treatment and recommendations for severity-based management.

All categories of persistent asthma require daily therapy with anti-inflammatory agents. Care providers must be able to have the time to establish a partnership with the patient/family, ask the critical questions (wonderful sample questions for initial assessment, environmental assessment, and follow-up are included within the guidelines) to determine how extensively asthma is affecting the lives of the child and family members and provide education. Patients and families must face asthma as a chronic disorder that requires long-term management, including both pharmacologic treatment and environmental avoidance, to achieve control. Parents of poorly controlled children will often accept a nighttime cough, inability to fully participate in sports and activities, and school and work absence as part of the expected disease

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Guidelines for the Diagnosis and Management of Asthma (continued)

process. The care provider and family must come to consensus regarding goals of therapy so that they can work effectively toward attaining those outcomes. A written action plan must be established for routine, step-up care and emergency management.

The EPR-II emphasizes the central role that the primary care provider must play in patient and family education. Education is a continuous process, which requires reassessment, review, and reinforcement at each encounter. However, in the current third-party reimbursement environment, can primary care physicians afford to invest the time it takes to provide this? Physicians are not reimbursed for time spent educating patients. It may not be fiscally feasible to employ nurses or therapists with skills and knowledge to assist with education because it is also not reimbursed. Consumers and professionals need to target the third-party payers to ensure that education is not some "nice" thing that is occasionally done with asthma patients but is seen as an essential aspect of asthma management.

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Commentary 4—From a Guideline User's Perspective: Once again the NAEPP has convened an expert panel on asthma: the two expert panels have created excellent guidelines for diagnosis and management of asthma. The first and second sets of guidelines are essential to anyone involved in the care of the asthmatic patient.

My experience with using the guidelines has changed over the years. When the 1991 guidelines were released, I was part of a committee looking at standardization of asthma education in the pediatric and adult populations. The committee had spent many hours working on asthma education materials. At that point we were spinning our wheels and not getting much accomplished. The *Teach Your Patients About Asthma: A Clinicians Guide* was a welcome relief to our group. The guide was released by the NHLBI and was based on recommendations of the *Expert Panel Report: Guidelines for the Diagnosis and Management of Asthma* (1991). By stressing the importance of patient education our committee was able to achieve the goals we had been striving for over the past few years. The guidelines helped us show the importance of asthma education and administration. We were then able to receive the necessary support for providing asthma education and written materials to patients. With the help of the *Clinicians Guide* we were able to standardize the educational materials. Over the years we have created an excellent asthma education program for our inpatients.

My second experience with using the guidelines was in the development of our inpatient asthma care pathway. A multidisciplinary team was assembled to develop the care pathway, order set, and a patient care pathway. Having guidelines to use in the development of the pathway was essential. The time we spent in development was greatly reduced because of the *Expert Panel Report*. It was also much easier to reach consensus. The team applied the guidelines to the care pathway we developed. The team reviewed the Four Components of Asthma Management and incorporated all these components into the care path. We placed strong

emphasis on emergency-room turnaround, patient assessment and history, smoking cessation, physician follow-up after discharge, and patient education.

The most recent experience I have had with the guidelines has been in the outpatient setting. I am the project leader for the development of outpatient asthma guidelines for the Methodist Medical Group. Again a multidisciplinary team was convened to establish these outpatient guidelines. We spent many hours in development and are now beginning the pilot phase with three different pilot sites. The pilot sites include a managed care physician office, a pulmonary specialty office, and an internal medicine office. The *Expert Panel Report* was a very valuable tool in the development of these outpatient guidelines. I was also able to use information I received from a conference where Gary S. Rachelefsky, MD, of the American Academy of Pediatrics (and a member of the NAEPP Coordinating Committee) spoke on some key changes that would be occurring with the new guidelines. This group placed importance on correct diagnosis, peak flow monitoring, asthma education, appropriate medication usage, smoking cessation, and having a written action plan.

One area in which we had problems was determining when a patient should be referred to a specialist. The new guidelines address this issue. The team will now be able to incorporate recommendations from the new guidelines regarding specialty referral. The addition of questions to use for diagnosis and initial assessment will assist our pilot sites in making the correct diagnosis. The new guidelines address areas of concern.

The biggest challenge with these projects is determining who will have the time to provide the interventions that we feel are essential. The physicians' concerns are very valid regarding office time and resources available to assist with the guidelines we have established.

In the past, consensus has been an issue with the development of guidelines. That has not been an issue here because we had the *Expert Panel Report* and because we used a multidisciplinary team approach. In each case a physician champion was identified which emphasized physician support and buy-in.

One other challenge has been in disseminating the information. The sharing of the guidelines has been easier with the pulmonary specialty group than with primary care physicians. Primary care physicians are bombarded on a daily basis with new guidelines. Depending on patient volume and physician interest, the guidelines are not always deemed important.

The *Expert Panel Report* and the *Expert Panel Report II* are very valuable tools for the diagnosis and management of asthma. Anyone caring for asthmatic patients should use these and the other resources available from the NHLBI.

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To obtain a copy of *Expert Panel Report II* (\$7.00), call or write the NHLBI Information Office, PO Box 30105, Bethesda, MD 20824-0105; 301/251-1222.

**The Impact of Disease Management on Outcomes and Cost of Care:
A Study of Low-Income Asthma Patients**

The Impact of Disease Management on Outcomes and Cost of Care:

A Study of Low-Income Asthma Patients

An asthma disease management program designed specifically for low-income patients experiencing significant adverse events can substantially improve health outcomes, while lowering costs. The Virginia Health Outcomes Partnership project aimed to help physicians in a fee-for-service primary care case management program manage asthma in Medicaid recipients. Approximately one third of physicians treating asthma in an area designated as the intervention community received training on disease management and communication skills. The impact of this training was measured based on an annual rate of 2,515 claims for asthma emergency services and 9,905 claims for asthma drugs in the intervention community averaged over 2 years. This study discovered that the rate of emergency visit claims for patients of participating physicians dropped an average of 42 percent relative to the comparison group. Although only a third of the eligible physicians participated in the training, community-wide effects on emergency visits and prescription use were observed. Emergency visits declined 7 percent relative to the comparison community, while the dispensing of drugs recommended for asthma increased 25 percent relative to the comparison community. A cost-effectiveness analysis revealed direct savings to Medicaid of \$3 to \$17 for every incremental dollar spent providing disease management support to physicians. The results of this study demonstrate the potential this program offers, especially for Medicaid programs in other states that want to improve the care of their primary care case management enrollees and, at the same time, manage costs.

**The Impact of Disease Management on Outcomes and Cost of Care:
A Study of Low-Income Asthma Patients**

Concerns about the health outcomes and costs of care for Medicaid recipients with chronic diseases led to the development of a model program designed to enhance quality and reduce overall cost of care for Medicaid patients enrolled in the primary care case management program in Virginia. Known as the Virginia Health Outcomes Partnership (VHOP) project, this model program aims to provide Medicaid programs with the means to deliver high-quality patient care and thereby produce more favorable outcomes. At the same time, this program focused on helping physicians and patients avoid less effective treatments and expensive settings for care, such as inpatient hospital services and emergency rooms. The program was designed for easy replication or adoption in other states, particularly those with primary care case management programs (Hawks and Levy 1996).

To determine the best candidates for intervention, the program began by studying numerous diseases among the fee-for-service Medicaid population in Virginia. Asthma was selected primarily because of the prevalence of the disease, the national medical consensus about treatment protocols, the ability to measure specific outcomes, and the cost of services and related medications to Virginia Medicaid (Jones et al. 1996). An early analysis of data from Medicaid claims in Virginia showed opportunities for improvement because a large number of people were visiting emergency rooms to receive treatment for asthma (Rossiter et al. 1996). Although effective pharmaceutical therapy for asthma is available, the prevalence of deaths associated with asthma and outpatient clinic visits for asthma have risen nationally by 50 percent in the last ten years (CDC 1995, Knapp 1996). Intervention in the form of improved prescribing by physicians and the appropriate use of asthma medications by patients should reduce the need for costly emergency treatment. A reduction in the number of claims for emergency room visits would serve as a key indicator of how well outcomes improved.

We hypothesized that health outcomes would improve substantially following the implementation of a voluntary, intensive educational program. This program would offer physicians a multipronged approach to managing asthma. Key elements of the program include: enhancing the communication skills of medical professionals, especially with regard to asthma; offering information to these professionals about advances in clinical practice and state-of-the-art medications; and providing periodic feedback to participants regarding emergency service encounters for their asthma patients enrolled in the program.

An important objective of this study was to determine the intrinsic potential of this disease management program to improve the health of low-income Medicaid patients while achieving cost savings in providing treatment. This potential was assessed by determining the effect of the program on those patients with medium to severe asthma whose physicians participated in the study. Since VHOP was a population-based initiative, it was especially important to assess the community-wide impact of the program. We determined this impact by estimating these measured effects across all eligible physicians and patients in the intervention communities, whether or not the physician participated in the program. Program effects were also extrapolated statewide for all eligible physicians and patients.

Most private sector disease management programs operate within managed care, and require at least some level of participation by all eligible physicians. Since the VHOP pilot program was entirely voluntary, its overall effect would depend on the proportion of eligible physicians recruited. Despite the voluntary nature of VHOP, we hypothesized that providing incentives to participate and offering opportunities to learn with peers would attract enough physicians to detect some favorable outcomes across the entire intervention community.

Methods

Establishing a Baseline of Patients

We used an intervention area - comparison area research design to track changes through time, yet control for changes in background conditions and self-selection of patients and physicians into the program. Using claims files from the Virginia Department of Medical Assistance Services, we identified a census of fee-for-service Medicaid recipients. These recipients were eligible to receive Medicaid in July 1995, January 1996, July 1996, or January 1997, and they had at least one asthma-related claim for physician office visits, hospital outpatient visits, or hospital emergency visits. These claims also fell within the range of ICD codes 493.0 - 493.9.

For the same period, we identified a census of patients having at least one claim for asthma drugs. Asthma drugs were identified using National Drug Compendium (NDC) codes of the Food and Drug Administration associated with the generic names for drugs used to treat asthma according to published guidelines (NHLBI 1992, 1997). Once the generic names were identified, NDC numbers were associated with those names by matching brand and generic names for single and multiple entity products to NDC listings (First Databank 1995, 1996).

These Medicaid recipients, having both received asthma-related services and been prescribed asthma drugs, were defined as the baseline asthma patients. The physicians assigned to these patients by Virginia's primary care case management program (the "Medallion" program) were identified. Enrollees in the Medallion primary care case management program were then selected for the study. Assigning each of these patients to a single physician enabled us to create patient-level files that linked the physician, claims for services and asthma prescription drug claims data.

Figure 1 illustrates the samples that were drawn from the relevant subset of all 598,807 Virginia Medicaid recipients. The patient samples consisted of those recipients with any claim filed for any asthma-related care in Medicaid fiscal year(s) (FYs) 1996 and 1997 (July to June). The total numbers of Medicaid recipients in Virginia are distributed among four categories: 87,778 are eligibility category "Aged or Blind" with Medicare as a primary payer; 109,313 are "Disabled"; 306,855 are "Children"; and 94,861 are "Adults with Children".

Only recipients in the primary care case management program, primarily "Children" and "Adults with Children", were eligible for sampling. Those remaining in traditional fee-for-service were not included in the study because they are not assigned to a participating physician, making it difficult to monitor an ongoing disease management program. Others, enrolled by choice or by assignment to health maintenance organizations, were not used in the study because they do not have Medicaid claims reported in the data files, and their care is more directly managed by the health maintenance organization.

Within the primary care case management population, Medicaid claims data were used from 7,153 asthma patients in Medicaid FY 1996 (2,618 in intervention communities, 4,535 in comparison communities) and 6,730 asthma patients in Medicaid FY 1997 (2,415 in intervention communities, 3,955 in comparison communities). In addition, although not shown in Figure 1, claims for asthma drugs were studied for 9,905 patients in intervention communities and 25,742 patients in comparison communities.

Claims data were reformatted into a disease-structured database that permitted a statistical analysis of individuals with asthma based on the number of claims by type and cost. Prior to the intervention, Virginia Medicaid was spending over \$16.7 million in the fee-for-service sector for asthma services: \$1.9 million for inpatient hospital stays (11.4 percent); \$5.8 million for hospital

emergency department visits, excluding urgent care visits (34.7 percent); \$1.8 million for hospital outpatient visits, including urgent care visits (10.8 percent); \$3.8 million for physician office visits (22.8 percent); and \$3.4 million for medications (20.4 percent). Claims from hospital emergency room visits were combined with claims from urgent care hospital outpatient visits in an effort to study what this paper defines as "emergency visits."

Conducting the Intervention

In October 1995, the Medicaid asthma patients and their physicians were identified from eight counties, as well as metropolitan Richmond, and these physicians were targeted for the VHOP intervention. These counties became our intervention communities. A set of counties elsewhere in the state that closely matched the intervention counties for size of Medicaid population, average family income, and number of local hospitals and doctors became our comparison communities. Asthma patients from both the intervention and comparison communities, along with their physicians, were selected for the study if they had at least one asthma-related service claim within two quarters prior to the intervention. To quantify differences between intervention and comparison communities before the intervention, three fiscal years of Medicaid claims data were compared for numerous measures of asthma service, use, and costs. This report, however, uses only pre-intervention comparisons for the two quarters before the program started, beginning with the first quarter of FY 1996, July-August-September. Using a longer pre-intervention period in preliminary analysis to quantify beginning differences between intervention and comparison communities yielded similar levels for each measure of comparison and added little information for pre-intervention comparisons.

The VHOP outcomes measurements began in the first quarter of FY 1996 (July-August-September 1995), and continued through the third quarter of FY 1997 (January-February-March 1997). The

observed pre-intervention period was the first two quarters of Medicaid FY 96 (June-August-September 1995 and October-November-December 1995). The follow-up period consisted of the five subsequent quarters (January-February-March 1996, to January-February-March 1997). The educational workshops were conducted October 1995 to May 1996. We selected the first full quarter prior to any training (quarter -2) as the baseline quarter for analyses because physicians were scheduled for their educational session over an eight-month period. Knowing it would take eight months to train all the physicians, we anticipated a gradual onset of the effect. After these sessions, feedback reports on the physician's asthma patients' service claims were sent to participants at six-month intervals. Each physician received three of these reports over the course of the study.

Recruiting Physicians to Participate

VHOP employed a variety of tactics to recruit eligible physicians from the intervention community into the entirely voluntary educational program. Free educational materials, professionally prepared and presented with practical and realistic demonstrations, were provided. In addition, physicians who participated received free continuing professional education credits.

The recruitment effort successfully reached 65 physicians and the 632 asthma patients with claims for asthma services assigned to them by the Medicaid program. These physicians represented approximately 33 percent of all eligible physicians in the intervention communities—that is, those physicians enrolled in the primary care case management program who have at least one patient assigned to them with an office or emergency visit claim for asthma. These participating physicians were treating approximately 26 percent of the patients with claims for asthma services in the intervention communities.

The Focus of Physician Workshops

Workshops were offered to primary care case management physicians from the fee-for-service sector. The 65 physicians recruited from the intervention communities participated in these VHOP workshops and also received patient-level feedback reports on post-intervention emergency service encounters immediately after attending a training session and quarterly thereafter. These physicians were told about the purpose of the program: to reduce emergency visits for asthma and increase the appropriate use of state-of-the-art asthma medications.

The workshops discussed state-of-the-art guidelines for managing asthma and provided instruction on how to communicate more effectively with patients, especially asthma patients. These sessions were also designed to develop the skills of community physicians so that they could then teach members of their staff, as well as patients, about state-of-the-art guidelines for treating asthma (Homer 1997) and how to use asthma devices properly. This education-based strategy for managing disease is increasingly being used by commercial insurers but carefully researched results of the approach is not widely published especially for low-income asthma patients (Homer 1997).

The core of the workshops consists of a communication curriculum that uses multimedia and well-tested techniques for educating adults. The asthma portion of the curriculum consists of reviewing current guidelines based on national asthma guidelines (NHLBI 1992, 1997), modified by a local panel of clinical experts (Whitehurst-Cook 1994). Physicians also receive VHOP-produced teaching and reminder aides to use with their own nursing and office staffs and patients. The workshops stress the importance of using effective techniques to communicate with patients, including how to negotiate treatment plans. In addition, workshop participants receive hands-on practice with asthma devices such as peak flow meters and a variety of inhalers. Evaluations from

the participants consistently showed very high rankings, and 99 percent reported that they would use the information in their practice.

At four to six-month intervals, all participating physicians received a list of their asthma patients to help them identify those individuals who might benefit from additional education and improved treatment. Since the workshops recommended specific techniques for intervening with service-intensive patients, patients with at least one asthma-related emergency visit pre- and post-intervention were highlighted in the feedback reports.

Analyzing Data

We began by analyzing the effects of intervention on those physicians who participated in the training (the participating physicians group). If this analysis indicated that the training had an impact on the way physicians managed their asthma patients, then we studied the effect that intervention had on the entire population of eligible physicians in the intervention communities, regardless of whether they participated in the program.

These analyses compared data over seven quarters, two prior to the intervention and five after the intervention. We cited the differences in Medicaid claims between, first, the physicians in the participating group and those in the comparison communities and, second, the entire population of asthma patients in the intervention communities and the comparison communities.

To assume an accurate comparison, we formed a relative risk ratio. This ratio compares the asthma outcome (for example, emergency visits per 1,000 persons) in the participating group or the intervention communities with the corresponding figure from the comparison communities. This figure is then divided by a similar ratio from the baseline quarter (quarter -2). A relative risk ratio of

less than 1.00 indicates a decreased rate of, for example, emergency visits for asthma in the intervention communities. A relative risk ratio greater than 1.00 indicates an increased rate for these patients. A t-test statistic for differences between rates of service or drug used per 1,000 in each quarter is used to test for statistical significance.

Given the seasonal nature of chronic asthma, we hypothesize that intervention is more likely to be effective during fall and winter (quarters -1, +1, +4, and +5) when the high frequency of asthma attacks offer more opportunities for improvement. During spring and summer (quarters +2 and +3), the low frequency of asthma attacks means opportunities for improvement are at their lowest.

A related issue to the seasonal nature of asthma is regression to the mean. Regression to the mean over time is common in a chronic disease such as asthma. In other words, a certain number of people who had an adverse outcome early tend to get better and avoid another adverse outcome later, regardless of whether intervention was in place. Others who had no adverse events early tend to have one later. Thus, if given enough time, a panel of people tends to move or regress to the average.

The research has been designed to account for seasonal variation and regression to the mean because it compares two similar groups of communities in the state during the same season of the year. The question, then, is not whether asthma emergency visits fell following the intervention. Rather, the question is whether asthma emergency visits fell when compared with a similar geographic area at the same season of the year as the intervention. Both groups would demonstrate regression to the mean to the extent it occurs among low-income asthma patients. Thus, the regression to the mean effect is held constant in the intervention group relative to the comparison group over time.

Results

The results are shown for asthma patients of participating physicians and also for all the asthma patients in the intervention communities, whether or not their physicians were successfully recruited for training. The key measures of outcome are claims for emergency visits for asthma and claims for guideline-recommended drugs. Asthma control should be improved if claims for emergency visits fall and guideline asthma drugs increase in association with the program. In the pre-intervention period, the comparison communities had lower rates of emergency visits per 1,000 patients and lower rates of claims for recommended drugs (except during one quarter for albuterol nebulizers); and participating physicians' patients had lower pre-intervention emergency service visit rates than those in either the intervention or comparison communities. All these rate differences are statistically significant ($p < 0.001$). Although the starting values for outcome indicators were not the same pre-intervention, these differences were accounted for throughout the analysis.

The Impact of Training Participating Physicians

Table 1 shows rates for asthma emergency visits in the participating physician group and comparison communities that were selected to be studied both pre- and post-intervention. Recall that this group of participating physicians, which is associated with 26 percent of eligible patients, received specific instructions on the steps they could take to improve asthma control. They also learned which asthma drugs to recommend and how to communicate with patients in ways that improve outcomes.

Substantial reductions in asthma emergency services (visits per 1,000 patients) were observed for patients of these physicians (Table 1, under the row labeled "Relative risk"). No reductions occurred

during the first two post-training quarters. A sharp reduction (47 percent) was observed during the third post-training quarter, and the reduction persisted cut into the fifth post-workshop quarter, which was the last quarter studied. The reduction in emergency visits, averaged over the third to fifth post-intervention quarters, was 42 percent, and averaged over all five post-intervention quarters, a 25 percent reduction occurred. While the sharp reduction in emergency visits occurred about the same time feedback reports were delivered to physicians, we do not suggest a causal relationship between the sharp reduction and the arrival of these reports.

This effect was observed despite some longitudinal variation in emergency visit rates in the comparison group. As mentioned above, the relative difference in visit rates between the intervention and comparison groups (relative risk) controls for any baseline rate differences or longitudinal changes in the comparison group. As shown in Table 1, pre-intervention visit rates started out much lower among the patients with trained physicians, but the relative risk was about 1.0 in the two pre-intervention quarters. Emergency visits peaked in the quarter immediately prior to the intervention in both the trained and comparison groups. Although rates fell in both groups after the intervention, by the third quarter the comparison group rates had rebounded toward their pre-intervention values (157.5 visits per 1000 patients in quarter +4, for example). Rates in the trained physician group, however, had fallen sharply by comparison in the third quarter and stayed down thereafter.

The Impact Community-wide of Intervention

Table 2 shows the effect of intervention across the entire intervention community. After the intervention, the community-wide relative risk of an emergency visit for asthma ranged from 0.739 to 1.067 of the pre-intervention rate of asthma emergency visits per 1,000 patients. The intervention had its intended effect only initially, with no overall trend by quarter. However, the five

quarters after the intervention had an average rate of emergency visits that was approximately 7 percent lower than the rate for pre-intervention quarters.

Claims for asthma drugs were sustained community-wide for all asthma patients of participating physicians, not just those individuals with emergency visits for asthma. As Table 3 shows, the dispensing of drugs recommended by the guidelines for asthma rose sharply during the study period in the intervention communities. The increase was as much as 25 percent in some cases. The use of albuterol metered dose inhalers and nebulizers rose significantly when compared with communities without the VHOP intervention. These comparison communities had lower levels of recommended asthma drug use during the pre-intervention period.

In the intervention communities, the use of albuterol metered dose inhalers rose between 22 and 31 percent by the last two quarters studied. In the comparison communities, the use of these drugs remained relatively flat. The use of albuterol nebulizers rose in the intervention communities relative to the comparison between 18 and 24 percent, although not all quarters are statistically significant. Both albuterol drugs are "relievers" and offer relief for acute asthma attacks. At the same time, the program had no apparent community-wide effect on the use of steroid-metered dose inhalers, asthma preventors used to avoid attacks. We examined other types of relievers and preventors, but they are not shown here. They either were used at very low levels or showed no significant change from the intervention.

The use of inhaled cromolyn metered-dose inhalers, which was not recommended in the physician workshops, actually fell during the study period in the intervention communities relative to the comparison communities. Use of inhaled cromolyn nebulization inhalers remained the same.

Analyzing the Cost Effectiveness of Intervention

By analyzing the Medicaid claims data available to the study, we can determine the cost effectiveness of the VHOP intervention. Reviewing this data also makes it possible to project what effect the program might have from the standpoint of cost for the entire Medicaid primary care case management program. In Table 4, we estimate the cost effectiveness of the program for both the participating physicians group and the intervention communities. We then project this effectiveness statewide to asthma patients with any asthma service claim in the primary care case management program.

The effect of the intervention is indicated by the relative risk after the intervention. Table 1 shows the impact on patients with participating physicians, and Table 2 shows the effect for patients in communities with the intervention. If we average the relative risk across the five post-intervention quarters examined, the participating physician effect was a reduction of 0.75. Based on this factor, we determined the estimated number of emergency visits that would have occurred without the intervention is 2,111. The same averaging of relative risk for the community effect reveals a reduction of emergency visits by a factor of 0.93. Based on this factor, the estimated number of emergency visits that would have occurred without the intervention is 1,702.

Inpatient hospital emergency visits and urgent care emergency visits cost an average of \$540 for each of the 1,583 claims (see Table 4). Based on that average cost, Medicaid spending for asthma was reduced by \$64,260 ($1,702 \times \$540 - 1,583 \times \540) to \$285,120 ($2,111 \times \$540 - 1,583 \times \540) over the course of five quarters from the start of the intervention. This reduction in spending came about by avoiding visits to the emergency room. If the two post-intervention quarters where the effect was delayed are not averaged in, the cost savings calculated for the participating physicians would be about 40% greater. Table 4 uses these impacts as high and low effect sizes to explore

the cost effectiveness of the program in the study communities and for all asthma patients in primary care case management with any service claim.

The program yielded an estimated savings for the Medicaid program of between \$950 and \$4,300 per physician trained. At the same time, the metric quantities shown in Table 3 indicate the cost for asthma drugs rose per physician trained by roughly \$180. The net savings, then, ranged from \$770 to \$4,120, given a developed program. The incremental costs for VHOP training in asthma and communication skills was \$235 per physician. Based on these figures, each dollar spent in training another physician generates from \$3 to over \$17 in program savings.

Of all Medicaid recipients in Virginia in the fee-for-service primary care case management system, 16,627 patients had asthma service claims. Had the program been implemented to cover all these recipients statewide, the savings would have been significant. We estimate the system would have saved approximately \$350,000 to \$2.25 million from reduced emergency visits for asthma care from those observed patients who received treatment (Table 4). This savings would have been achieved without enhancing the program from its initial intervention phase.

Conclusions

A disease management program designed especially for low-income patients facing significant adverse events can substantially improve health outcomes. Asthma attacks are caused by predictable triggers that patients can modify. Using effective communication skills, physicians can educate patients about their role in treatment by helping them develop state-of-the-art skills for managing asthma. A disease management program can support physicians in partnership with Medicaid to lower costs.

Appropriate Use of the Emergency Room

In the case of treating asthma, every dollar spent in a disease management program helped reduce

Virginia Health Outcomes Partnership: Summary of Conclusions

	Effect After VHOP Intervention
Claims for Emergency Visits	↓
Use of Asthma Drugs	↑
Inhaled Albuterol Metered Dose Inhaler	↑
Inhaled Albuterol Nebulizer	↑
Inhaled Steroid Metered Dose Inhaler	Same
Claims for Physician Office Visits	Same

the use of costly emergency visits. Even after accounting for seasonal variation and regression to the mean, rates of emergency visits for patients of participating physicians started to fall in relation to comparison communities. These rates began to drop within two calendar quarters following the implementation of the program. This somewhat delayed onset is likely due a combination of the staging of the education program, the time required for the education to affect physician and patient behavior, and the resulting reduction in emergency services claims. The relative risk of adverse health outcomes, measured as asthma emergency visits, remained low for the three subsequent quarters examined. The effect on patients of participating physicians was to reduce emergency visits about 40 percent in the fall and winter, and about 22 percent in the spring summer, in support of our hypothesis that the program would be more effective during the asthma season when the opportunities for improvement are greater.

Appropriate Use of Drugs

The use of recommended asthma drugs increased by as much as 25 percent, but not all types of asthma drugs. The use of reliever drugs, albuterol metered-dose inhalers and nebulizers, increased. However, the use of preventor drugs such as steroid metered-dose inhalers remained

the same after seasonal adjustment by comparison to other communities. Certain drugs not recommended for use, such as cromolyn metered-dose inhalers, declined in use.

A change in the use of preventors might be observed over more time, or through even greater emphasis in the workshops on the difference between preventors and relievers. Physicians may have to place extra attention on communicating the importance of prevention before low-income Medicaid patients increase in their use of preventors. Such patients face many social and financial problems, and it may be enough to ask the patients to know what to use for acute attacks to avoid the emergency department. Avoiding the need to make emergency visits for treatment was the main goal of the program.

Benefiting from the use of preventor drugs in the absence of symptoms may not be a priority for this group of patients. We speculate that those patients with moderate to severe asthma targeted by the intervention may have been more ready to change and would have received optimal benefit from the use of relievers if their condition had been more exacerbated than the mild asthma patients in the study. Many mild to moderate asthma patients suffer through acute attacks without treatment until they are seen in the emergency department. These patients may have only intermittent asthma with infrequent attacks. Identifying and targeting these patients would increase the number of preventor drugs used and reduce further the use of the emergency department.

Cost Savings

There are different ways to look at the cost savings generated by the program. The incremental costs for each physician trained excludes the design and research costs that have already been paid by a grant. To incorporate costs of development would raise the cost of the disease

management program, but developmental costs would have to be spread over a larger program and several years to be adequately addressed. In addition, the development of the communication skills curriculum would be spread over several diseases. Even with conservative assumptions, the development costs would have a small effect on the cost-effectiveness ratio spread over more diseases, patients, and years of program operation.

Effects of the Program at the Community Level

Only a fraction of the physicians in the intervention communities participated in the program. About 200 physicians in the intervention communities accounted for over 85 percent of all the patients with any service claims for asthma. However, the program reached only 66 of these physicians, and they were the ones with fewer emergency visits for asthma per 1,000 patients at the baseline. Their patients experienced relatively less severe illness when compared with the patients of untrained physicians in both the intervention and comparison communities. Thus, there was a bias against favorable outcomes for trained physicians.

Despite this bias and the relatively small number of physicians trained, the program had an effect on the use of emergency services and drugs at the community level. Since the effect on emergency service visits was spread among all (trained and untrained) physicians in the intervention communities, we did not observe large, consistent changes at the community level for emergency visits. However, the effect on visits was large in the first quarter, when the program was heavily marketed to all 200 physicians by mail, faxing, and phone calls.

There is an explanation for the sustained effect at the community level on drug use but not on emergency service visits. Trained physicians retained a direct link with and control over drug prescribing. For every asthma patient with a service claim, there are roughly two others without a

service claim but with a drug claim for asthma. It could well be that after training, physicians dramatically changed their patterns for prescribing drugs to this large group of asthma patients with drug claims. Trained physicians can also attempt to reduce emergency visits, but will only be successful when the patient adheres to the treatment.

Enhancing the Program

Enhancing the effectiveness of the program must begin with extending the reach of the program to include more participation from physicians. The direct cost savings of \$64,260 to \$285,120 resulted from participation of only 26 percent of the eligible physicians from the intervention communities.

Much greater savings are possible with more vigorous recruitment efforts. In developing the program, we conducted physician focus groups. The physicians in the focus groups, all participating primary care case managers in Medicaid, had opinions about when to best schedule the training sessions, the importance of providing a financial incentive that made the training free, the most useful types of materials to take back to their practices, and the importance of the identities and credentials of the presenters. All these were addressed in the design of the program. More rigorous recruitment may cost more money, raising the cost of conducting the program and negatively affecting the cost effectiveness. Yet further enhancements in the recruitment, including even stronger financial incentives and greater expectations from Medicaid for participation, would probably increase the number of physicians attending workshops.

Opportunities also exist for enhancing the effectiveness of the program. One way to do this is by reassigning patients with persistent emergency visits for asthma from physicians who have not received VHOP training to physicians who have received VHOP training. We prefer an approach that reassigns patients to physicians who volunteer to attend the training because the volunteer

effect will likely weaken as a larger proportion of eligible physicians are recruited. Results in an educational program are more likely to be favorable among volunteers than conscripts.

The Potential Impact of Expanding Physician-Patient Partnerships

Since the conclusion of this pilot study to train physicians, the VHOP program has expanded. Now, the program incorporates pharmacist training and involves the statewide point-of-sale prescription drug system. The results of this training will be available in 1998, and at this writing 68 pharmacists have received training in communication skills and guidelines for asthma in the intervention communities.

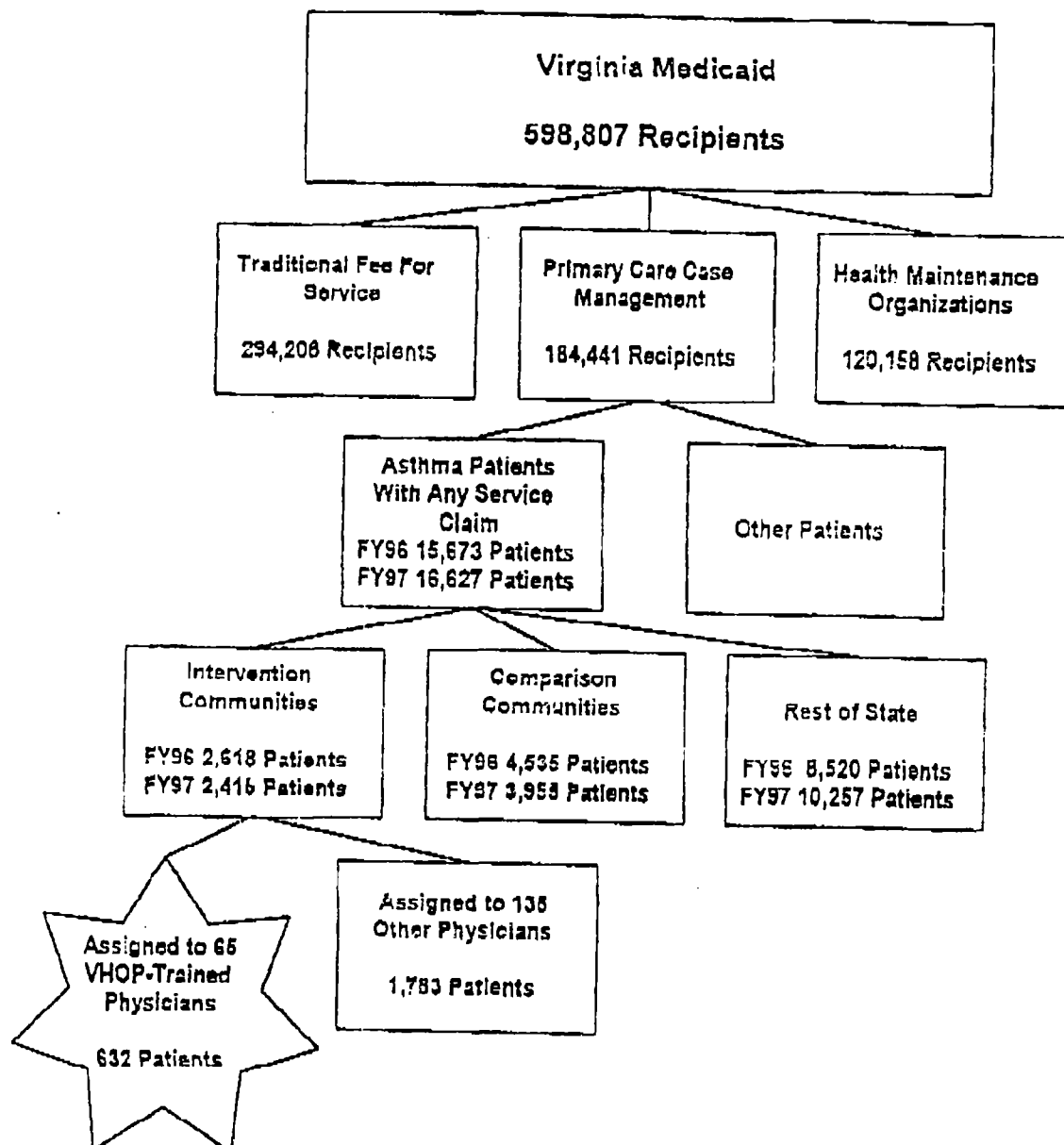
The state's point-of-sale prescription system could be used as a tool to remind trained pharmacists to communicate optimal treatment guidelines with patients of trained physicians. This intervention would help assure that patients better adhere to the treatment regimen. Encouraging a strong partnership among patients, pharmacists, and physicians might be the best approach to improving outcomes for a chronic disease (Thomas 1996). After all, asthma is a disease that can be controlled with the tools medicine has to offer today if they are properly used by the health professionals and patients who need them. Three other diseases with the same potential for quality and cost improvement have been identified – heart failure, diabetes, and schizophrenia – and intervention education materials and guidelines have been developed.

Although Medicaid programs across the country continue to expand mandatory enrollment in health maintenance organizations, there is reason to believe Medicaid will remain largely fee-for-service in many states. Several factors will slow or even halt the enrollment of large numbers of Medicaid eligibles into contracted health plans: low capitation payment rates to managed care plans, threatened loss of the traditional patient base for politically powerful community health centers or

teaching hospitals, and the inability to force persons who are dually eligible for Medicaid and Medicare into managed care plans.

The partnership approach uses the techniques of professional medical interviewing and disease management to support physicians, pharmacists and nurses as they improve health outcomes for their patients—thereby lowering costs at the same time. States searching for ways to improve health outcomes for their Medicaid enrollees may find the partnership approach to be a useful option for managing diseases for those enrollees remaining in fee-for-service.

Figure 1: Virginia Health Outcomes Partnership: Virginia Medicaid recipients by program type, asthma disease state, intervention or comparison community status, and VHOP trained physician assignment- Fiscal Year 1997.



TABLES

Table 1: Virginia Health Outcomes Partnership: Emergency Visit Rate Per 1,000 Asthma Patients for Participating Physicians Versus Comparison Communities By Quarter, July 1995 - March 1997.

FISCAL YEAR	Pre-Intervention		Post-Intervention				
	Fiscal Year 1996		Fiscal Year 1997				
	JAS	OND	JFM	AMJ	JAS	OND	JFM
QUARTER	-2	-1	+1	+2	+3	+4	+5
Emergency Visits/1,000 Patients	Mean (S D)						
Patients With Participating Physicians and Feedback	60.3 (0.45)	81.5 (0.51)	62.7 (0.42)	31.4 (0.28)	29.0 (0.58)	47.0 (0.59)	35.3 (0.50)
Comparison Communities	117.3 (0.49)	157.0 (0.52)	123.7 (0.43)	59.5 (0.29)	107.2 (0.47)	157.5 (0.56)	109.2 (0.49)
P-Values	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*
Relative Risk	1.00	1.01	0.99	1.03	0.53	0.58	0.62
Number of Patients With Claim for Service	Mean (S D)						
Patients With Participating Physicians and Feedback	n.a.	n.a.	632	632	632	632	632
Comparison Communities	4,535	4,535	4,535	4,535	3,955	3,955	3,955

*P value obtained from t-test for equality of means. Significant at 95 percent confidence interval.

n.a. Not applicable.

Source: Williamson Institute for Health Studies based on Virginia Medicaid data (fiscal 1996 and 1997)

Table 2: Virginia Health Outcomes Partnership: Emergency Visit Rate Per 1,000 Asthma Patients In Intervention Versus Comparison Communities By Quarter, July 1995 - March 1997.

	Pre-Intervention		Post-Intervention				
FISCAL YEAR	Fiscal Year 1996		Fiscal Year 1997				
	JAS	OND	JFM	AMJ	JAS	OND	JFM
QUARTER	-2	-1	+1	+2	+3	+4	+5
Emergency Visits/1,000 Patients	Mean (S D)						
Intervention Communities	143.6 (0.43)	177.2 (0.51)	111.9 (0.54)	66.5 (0.32)	121.3 (0.39)	205.8 (0.51)	135.0 (0.38)
Comparison Communities	117.3 (0.49)	157.0 (0.52)	123.7 (0.43)	59.5 (0.29)	107.2 (0.47)	157.5 (0.55)	109.2 (0.49)
P-Values	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*
Relative Risk	1.00	.922	0.739	0.912	0.924	1.067	1.009
Number of Patients With Claim for Service							
Intervention Communities	2,618	2,618	2,618	2,618	2,415	2,415	2,415
Comparison Communities	4,535	4,535	4,535	4,535	3,955	3,955	3,955

*p value obtained from t-test for equality of means. Significant at 95 percent confidence interval.

Source: Williamson Institute for Health Studies based on Virginia Medicaid data (Fiscal 1996 and 1997).

Table 3: Virginia Health Outcome Partnership: Asthma Drug Use Per Person With Any Asthma Drug in Metric Quantity in Intervention Communities and Comparison Communities By Quarter, July 1995 - March 1997.

FISCAL YEAR QUARTER	Pre-Intervention		Post-Intervention				
	Fiscal Year 1996		Fiscal Year 1997				
	JAS	OND	JFM	AMJ	JAS	OND	JFM
	-2	-1	+1	+2	+3	+4	+5
Inhaled Albuterol Metered Dose Inhaler							
Intervention Communities	23.6	22.5	25.6	26.6	32.5	34.3	31.8
Comparison Communities	21.5	20.7	21.7	22.6	23.8	23.9	23.7
P-Value	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*	<0.001*
Relative Risk	1.00	0.99	1.08	1.07	1.25	1.31	1.22
Inhaled Albuterol Nebulizer							
Intervention Communities	72.1	69.6	68.7	79.9	92.5	98.0	104.24
Comparison Communities	117.7	116.1	112.8	122.7	126.3	122.4	124.3
P-Value	<0.001*	0.126	0.015*	0.188	0.827	<0.001*	0.602
Relative Risk	1.00	0.98	0.99	1.06	1.20	1.31	1.37
Inhaled Steroid Metered Dose Inhaler							
Intervention Communities	16.2	12.5	13.0	13.2	11.9	11.3	11.4
Comparison Communities	10.4	10	11.5	10.6	10.9	12	11
P-Value	<0.001*	0.101	0.1	<0.001*	0.107	0.866	0.014*
Relative Risk	1.00	0.80	0.72	0.80	0.70	0.60	0.66
Inhaled Cromolyn Metered Dose Inhaler							
Intervention Communities	22.7	17.8	17.1	15.9	15.3	14.0	16.8
Comparison Communities	14.6	16.2	15.0	15.3	14.2	17.1	14.5
P-Value							
Relative Risk	1.00	0.70	0.73	0.66	0.69	0.53	0.74
Inhaled Cromolyn Nebulization Inhaler							
Intervention Communities	166.8	161.6	170.0	160.7	181.5	171.1	169.4
Comparison Communities	139.7	145.6	147.3	142.2	147.8	148.4	148.4
P-Value							
Relative Risk	1.00	0.93	0.97	0.95	1.03	0.97	0.96
Number of Patients With Any Asthma Drug							
Intervention Communities	8,582	8,582	8,582	8,582	11,228	11,228	11,228
Comparison Communities	24,306	24,306	24,306	24,306	27,179	27,179	27,179

*P value obtained from t-test for equality of means. Significant at 95 percent confidence interval.

Source: Williamson Institute for Health Studies based on Virginia Medicaid data (Fiscal 1996 and 1997)

Table 4: Virginia Health Outcomes Partnership: Cost Effectiveness of Avoided Emergency Visits for Asthma for Patients In Intervention Communities and Virginia Medicaid By Quarter, January 1996 - March 1997.

Fiscal Year 1997	Asthma Patients With Any Service Claims ^a	
	Intervention Communities	Virginia Medicaid Primary Care Case Management
Total Medicaid Recipients ^b	2,610	16,627
Cost Effectiveness Calculations:		
Actual Post Intervention Emergency Visit Claims		
Total	1,583	9,262
Quarter +1	293	
Quarter +2	174	
Quarter +3	293	
Quarter +4	497	
Quarter +5	326	
Estimated Emergency Visit Claims Without the Intervention		
Assuming mean quarterly impact		
In communities with the intervention (0.93)	1,702	8,614
Assuming mean quarterly impact		
of targeted patients with trained physicians (0.75)	2,111	6,947
Medicaid Savings (\$540 per claim)	\$84,250 - \$265,120	\$350,000 - \$2.25 million

^a Claims for services including: physician office visit, hospital emergency room, hospital outpatient clinic and inpatient hospital stay.

^b By eligibility category: Aged or Blind (Medicare primary payer), 8; Disabled, 457; Children Under 21 Years, 1,782; Adults With Children, 363.

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EXECUTIVE FELLOWSHIP IN MEDICAID DISEASE MANAGEMENT AND HEALTH OUTCOMES

*A Proposal for Executive Interchange for
Medicaid Directors, Pharmacy
Administrators, and Medicaid Managed
Care Companies*

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**EXECUTIVE FELLOWSHIP
IN
MEDICAID DISEASE MANAGEMENT
AND
HEALTH OUTCOMES**

Introduction

Disease management and health outcomes are innovations in Medicaid managed care that are becoming increasingly available through new types of contractors. They provide states the opportunity to make immediate improvements in care often with significant cost savings. They can also be used to ease the transition to more complex Medicaid managed care.

In this rapidly changing environment, it is essential that Medicaid directors and their top managed care staff keep abreast of the innovations in organization and payment that are occurring to serve the special needs of the Medicaid population.

This is an opportune time to provide Medicaid directors a vehicle to become more fully aware of the emerging opportunities and strategies available in the market and to share concerns with each other about the issues they face in their states. To assist with this, the Williamson Institute for Health Studies proposes to initiate a program with a retreat format in our new executive conference center on the Medical College of Virginia Campus and offer electronic conferencing capability for further interchange and discussion.

To assure the timeliness of the proposed program, some of the most prominent and forward-looking examples of disease management and health outcomes available in the United States and internationally will be highlighted. Our own Virginia Health Outcomes Partnership program which is the first disease management effort in Medicaid in the United States and now a permanent disease management contract in Virginia will be highlighted.

Background

Disease management and health outcomes offer a way for Medicaid programs to capture the benefits of managed care in a fee-for-service system. There are reasons to think Medicaid directors need to seriously consider these tools even though they are on a track toward capitation payment.

From the beginning of the Medicaid program to the early 1990s, Medicaid was largely a fee-for-service payment system, except in a few key states such as California, Arizona, and Minnesota. Demonstration programs in the 1980s showed that managed care programs, such as primary care case management and risk-based contracts with HMOs, could successfully curb Medicaid cost increases and make them more predictable while not reducing the quality of care (Freund et al 1989). Nearly all states turned to managed care programs when Medicaid spending exploded in the period 1988 - 1992 because of increasing enrollment, markedly increasing disproportionate share hospital payments programs, plus general and medical inflation, (Holahan and Liska 1996).

By 1995 nearly 12 million Medicaid recipients were enrolled in managed care programs, accounting for nearly one-third of all recipients and growing (Kaiser Commission 1998).

But the trend toward Medicaid managed care is largely limited to children and adults on Aid to Families with Dependent Children (AFDC). Primary care medical services for children and adults are the first to be covered by managed care programs in Medicaid, but they account for only 25 percent of program expenditures. The new coverage for children will change the figures, but today sixty percent of all spending is with the aged, blind and disabled, who have not been enrolled in HMOs except in a few demonstrations or in several 1115 waiver states (Kaiser Commission 1997).

There are several reasons to think that the aged, blind and disabled will remain in fee-for-service in many states.

1. Medicaid has traditionally made very low payments to providers in the fee-for-service sector. To the extent historical fee-for-service payments are used to establish the payment levels, capitation payments may be unacceptably low for managed care plans. Many managed care plans are reluctant to take on the risk for this most expensive group at below market rates.
2. Traditional providers serving the low income disabled and elderly, resist the changes that Medicaid managed care can mean for the patients they have customarily served. Medicaid recipients with the ability to select among health plan options or other providers in the community offered by a health

plan can be very threatening to politically powerful community health centers, teaching hospitals, and state mental health clinics and hospitals.

3. The most costly but relatively small group who are dually eligible for Medicare and Medicaid cannot be forced into a closed-panel health maintenance organization for the Medicare portion of their coverage.

Consequently, it is quite likely that most Medicaid programs will have an extremely resource-intensive group of recipients enrolled in a fee-for-service system for quite some time. Most are heavy users of inpatient, physician, and pharmaceutical care. The dually eligible are heavy users of pharmaceutical care under Medicaid because Medicare is the primary payer for the inpatient and physician care.

Nationwide, in 1994, there were 6.4 million blind and disabled Medicaid recipients, and 3.8 million aged Medicaid recipients. The blind and disabled accounted for 15.7 percent of Medicaid recipients and 33 percent of spending. The aged accounted for 11.2 percent of all Medicaid recipients and 26 percent of spending.

The assumption that risk-based contracts will be the universal form of coverage in the future could be a long way off. The needs of the aged, blind and disabled are complex and require a complex set of providers and sites of care that are mostly new to risk contractors. The political and professional environment of many states may slow or arrest the move toward capitation payments through the adoption of anti-managed care legislation. The Medicare-Medicaid crossover group may always remain in Medicaid fee-for service as long as freedom of choice to remain in Medicare is perpetuated.

Disease management, which attempts to systematically optimize therapy and improve outcomes, provides an exciting, low-cost, alternative or transitional strategy to Medicaid directors looking for answers to the issues of cost and quality in their programs.

States that have begun disease management programs are:

Virginia	Pharmacist being used to provide educational efforts to physicians on several disease states.
Florida	Asthma, diabetes, AIDS/HIV, and hemophilia now being implemented with disease management organizations.
Mississippi	Has received approval for federal financial participation support to implement disease management focusing on pharmaceuticals.
Oregon	Several pilots programs underway
West Virginia	Planning efforts have begun to implement statewide effort.

Program Objectives

The overall program objective of the Executive Fellowship in Medicaid Disease Management and Health Outcomes is:

- to bring together Medicaid directors with diverse program needs to study the principles and methods of disease management and outcomes assessment and critically examine their applicability to their own state.

Specific objectives of the program are:

- to provide an **informal learning environment** in which Medicaid directors and others can study and share insights into strategies for managing the diseases and improving the health outcomes of care for their program recipients
- to provide training in the following topical areas:
 - * disease management
 - * disease selection
 - * health outcomes
 - * pharmacoeconomics
 - * information system development
 - * personal leadership development and change management
- to study **cutting-edge strategies**, drawing upon distinctive examples world wide (no particular vendor will be presented, only examples of governments doing relevant programs)
- using **internet telecommunications**, to extend the learning process and to provide a unique colleague network for participating Medicaid directors
- to provide a forum for Medicaid directors to develop an in depth understanding of the issues and to seek feedback on and possible solutions to those issues
- to provide a forum for **networking among Medicaid directors** and potentially to establish a cadre of leading state Medicaid programs in the area of disease management and health outcomes.

Program Structure and Design

Selection of Medicaid Directors

We propose that 9-17 Medicaid Directors, Pharmacy Administrators, or top managers at Medicaid managed care companies be selected for participation in this program through a nomination system, administered by the National Pharmaceutical Council. The Williamson Institute would issue, in an academic style, an invitation to participate. Depending upon the response selected government affairs representatives from companies could be used to reinforce the invitation and recruit participants.

Depending upon the rules of each state, we anticipate some participants will need technical computer support, which would be provided by the staff at the Williamson Institute. It could also be facilitated through the sponsor's network of government affairs representatives. The support would involve connection to the world wide web for the telecommunications portion of the program.

On and Off-Site Seminars

The proposed Executive Fellowship is designed to combine on-site learning with distance seminars conducted via internet technology. The mix of on and off-site study minimizes the time of Medicaid directors away from work and home and reduces travel expenses. The off-site sessions via the internet provide a major distinguishing feature for the proposed program, setting apart from the typical policy conference attended by Medicaid directors.

Specifically, the off-site seminars:

- provide a vehicle for a more interactive study of issues raised during the on-site training program
- provide an opportunity for building a colleague network among program participants
- introduce the Medicaid directors personally to internet technology, one area that disease management and health outcomes itself is emphasizing
- provide a means of problem solving for busy executives in a secure and confidential environment

Time and Sequencing of Seminars

The Executive Fellowship will extend over a three month period, beginning with a 1 1/2 day on-campus session offered at the Paul and Gail Gross Executive Conference Center, next to the Williamson Institute in Richmond, VA and ending with a two-month off-site seminar session, discussed below. The initial on-campus program will commence in October 1998.

On-Site Seminars: The on-site program will include a mix of educational content focused on health issues, training in the use of the Internet (specifically in support of the off-site program), and opportunities for relaxation and visiting historic sites.

The following is a possible sequencing of on-site program activities:

Day 1 (Wed):	Travel to Richmond Evening Reception
Day 2 (Thr):	Educational Sessions (5 hours in seminars, 1 hour in computer lab).
Day 3 (Fri)	Educational Sessions (3 hours in seminar, 1-2 hours in computer lab) morning Travel home, afternoon

In advance of the on-site session, the Medicaid directors will be invited to prepare a brief overview of their program and population served, as well as current problems or issues they are facing. The overviews and issues will be presented briefly on the first day of the program. They will be candidates for study and problem solving during the off-campus session.

Off-Site Seminars: Approximately two weeks after the on-site session ends, the program will continue with two electronic seminars running simultaneously. One will have high-level continued policy discussion of the role of disease management and health outcomes for Medicaid, continuing the on-campus learning sessions. The other will focus on the problem or issue each director identified as something they would like to solve. The second seminar will facilitate all participants giving feedback and consultation on the director's issue.

The faculty and presenters at the on-site portion of the program will participate in the off-site seminars; setting up the seminars, providing ongoing discussion and comments, offering advice and expertise.

Program Closure: All participants will be given a professionally-printed certificate of completion, which be delivered to them at the end of the off-site portion. Another possible approach is to establish a separate meeting time for participants immediately before or after the regular Medicaid Directors meetings (Spring and Fall) to receive an update from each director on the progress of disease management and outcomes assessment in their state as solutions to their issue or problem. The certificate could be presented at such a program closure session.

Program Curriculum

The overall focus of the curriculum will be on new ways for Medicaid to tap into the emerging methods of disease management and health outcomes to change fee-for-service Medicaid while not necessarily converting it entirely to capitation or as a transitional strategy to capitation.

The topics covered for the on-site program follow:

Topical Outline

Introduction: Setting the Stage

- State Medicaid as Responsibility for a Defined Population
- Epidemiology and disease management
- Health services research and outcomes
- Pharmacoeconomics

Quality Assessment and Improvement

- The structure of quality assurance
- Data requirements
- The Role of Change Leadership from the Top – Personal Development from the Management Experts
- Medicaid HEIDIS

Partnership, Not Paternalism

- Patient Communication as the Key
- The Role of the Medicaid Provider as Coach for Good Patienthood
- Lessons from public programs around the world in Disease Management

Selecting Diseases

- Likely and Potential Diseases
- What to Look for in a Good RFP for Disease Management
- Provider Liability in Medicaid Disease Management

Disease Management and Health outcomes

- The Needs Assessment and Evaluation of Readiness to Change
- Information System Problems and Prospects
- What Can Be Eliminated and Lead to Streamlining
- The Political Economy of Medicaid Disease Management

The Impact of Disease Management on Outcomes and Cost of Care: A Study of Low-Income Asthma Patients

Louis F. Rossiter, Michelle Y. Whitehurst-Cook, Ralph E. Small, Charles Shasky, Viktor Bovbjerg, Lynne Penberthy, Ahmad Okasha, Jennifer Green, Ibrahim A. Ibrahim, Steve Yang

Louis F. Rossiter, Ph.D., is a professor, Lynne Penberthy, M.D., and Viktor Bovbjerg, Ph.D. are assistant professors, Ahmad Okasha, Ph.D., Ibrahim A. Ibrahim, MD, Ph.D., Charles Shasky, R.Ph., and Steve Yang were all doctoral candidates at the time of the research, and Jennifer Green is director provider education at the Williamson Institute. Michelle Y. Whitehurst-Cook, M.D., is assistant professor, the School of Medicine. Ralph E. Small, PharmD., is a professor School of Pharmacy. All are at the Medical College of Virginia Campus, Virginia Commonwealth University, Richmond, VA.

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Notes

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Comments Cynthia - The 51 pages attached is just some of the latest publications as a result of the VHOP (Disease Management) project..

I will send you more info in the mail. If you wish- you and Rob are invited to the presentation to Alabama on Dec. 2nd and 3rd. This will take place in Richmond.

Feel free to contact me at any time. Sincerely David Shepherd



From:
Medical Practice Communicator

Patient-Provider Communication and Managed Care

C. Everett Koop, MD

[Medical Practice Communicator 5(4):1,5 1998. © 1998 HMI Inc.]

The true measure of medical outcome consists of far more than surgical results or the regression of a disease process. It comprises the fusion of clinical success or failure with nurture of the complex relationship among physician, patient, and family.

I continue to advocate open and honest communication between patients and their healthcare providers. To do otherwise would be a disservice to the medical profession and to those who depend upon it.

Results from a Louis Harris poll show that 93% of the 230 primary care physicians surveyed agreed that serious medical problems could be averted if patients were more willing to talk about their problems, and two-thirds said that not being able to spend enough time with patients is a very serious or somewhat serious problem. Among the more than 1,000 patients questioned, a quarter admitted they were reluctant at times to talk to their doctors about a health problem. Nearly one in five said that he or she avoided talking about a health problem because the doctor seemed rushed or distracted. Often, patients said they were embarrassed to discuss problems such as urinary incontinence or sexual dysfunction.

Physicians who can't rely on their patients to report symptoms or to comply with their instructions cannot perform effectively, wasting time, energy, and, therefore, money.

Lamentably, few physicians today are prepared to communicate effectively with their patients. Medical students and residents have lost the advantage that I enjoyed of learning these skills from elder practitioners for whom communication was an art. As a result, young physicians enter medical practice brimming with enthusiasm and a mastery of medicine's vast technology, but often sadly deficient in the ability to relate to the very people they have pledged to serve.

In addition, the current practice environment often discourages extensive interaction between patient and provider. Many physicians have told me of the pressure and even the threat of financial penalty they feel from managed care and in non-managed-care settings to limit the time they spend with each patient.

Managed care still has an opportunity to initiate change from within. Several forthright actions (some of which innovative health plans already have taken) would improve patient-provider communications while protecting the managed care company's franchise:

- **Encourage:** -- with financial incentives -- member providers to cultivate their relationships with patients, such as by rewarding physicians if they score highly on patient satisfaction surveys. The formation of a bond between doctor and patient creates an atmosphere in which patients feel comfortable discussing important health issues and allows physicians to practice effectively and efficiently.
- **Entitle patients enrolled in plans to develop ongoing relationships with the same doctors.** Ensuring continuity of care elicits familiarity and trust and a greater likelihood that patients will more readily voice their concerns and comply with medical instructions.
- **Encourage providers to listen respectfully and thoughtfully to their patients, and provide instruction and explanations clearly and patiently.**
- **Encourage patients to express their concerns openly and honestly to their physicians.** Assure them that they will be heard and their observations will be taken seriously.
- **Establish the office of ombudsman, a neutral party who will listen to and adjudicate patient grievances.**

C. Everett Koop, MD, is the former US Surgeon General.

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Fatal Car Trunk Entrapment — Continued

The findings in this report are subject to at least three limitations. First because LEXIS-NEXIS may exclude cases in areas with minimal media coverage, may overlook cases that are not in the database because of search technique, and does not contain all newspapers in the country, the total number of cases identified may be underestimated. Second, because primary source ME/C data were not obtained for two incidents, information accuracy in media reports used for analysis is unknown. Third, because autopsy findings are often minimal or nonspecific, determining cause of death for these types of deaths is largely dependent on the circumstances and a thorough examination of the death scene.

State and local public health officials can use the findings in this report to guide prevention messages about children playing in or around car trunks. Effective public health strategies to prevent deaths associated with car trunk entrapments should include 1) preventing children's access to car keys; 2) keeping cars locked, with trunks closed, when cars are not in use; and 3) supervising young children closely when they are around cars.

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Forecasted State-Specific Estimates of Self-Reported Asthma Prevalence — United States, 1998

Asthma is a chronic inflammatory disorder of the lungs characterized by episodic and reversible symptoms of airflow obstruction (1). During 1993-1994, an estimated 13.7 million persons in the United States reported having asthma, and from 1980 to 1994 the prevalence of self-reported asthma in the United States increased 15% (2). Despite this increase, surveillance data are limited for asthma at the state and local levels (3). To estimate the 1998 prevalence rate of asthma for each state, CDC analyzed national self-reported asthma prevalence data from 1995. This report summarizes the results of the analyses, which project that approximately 17 million persons in the United States have asthma.

For this analysis, persons were considered to have asthma if they had had asthma diagnosed by a physician at some time in their life and had reported symptoms of asthma during the preceding 12 months. Using methods that have been applied elsewhere to forecast cancer rates (4), state-specific asthma prevalence estimates for 1998 were calculated using a three-step procedure: 1) race-, sex-, and age-specific asthma prevalence rates were calculated for each of the four U.S. census regions using data from the 1995 National Health Interview Survey (NHIS); 2) each state's 1998

Self-Reported Asthma Prevalence — Continued

demographic composition as estimated by the Bureau of Census was multiplied by the corresponding regional prevalences; and 3) linear extrapolations of region-specific increases in asthma prevalence from 1980 to 1994 were applied to the 3-year period from 1995 to 1998 for each state. Confidence intervals and relative standard errors for all estimates were calculated using regression parameters provided by CDC's National Center for Health Statistics for prevalence of chronic conditions (5).

In 1998, asthma affected an estimated 17,299,000 persons in the United States. The state with the largest estimated number of persons with asthma was California (2,268,300), followed by New York (1,238,200) and Texas (1,175,100) (Table 1). State-specific prevalence rates ranged from 5.8% to 7.2%. Differences in asthma prevalence rates between states were not significant. By region, 1-year period prevalence estimates ranged from 6.4% to 6.8% in the Northeast, 5.8% to 6.1% in the South, 6.6% to 6.7% in the Midwest, and 6.0% to 7.2% in the West.* The narrow range of prevalence rates within each of these regions indicates that state-specific differences in demographic composition minimally influenced estimated asthma prevalence.

Reported by: S Rappaport, MPH, B Boodram, MPH, Epidemiology and Statistics Unit, American Lung Association, New York City; Air Pollution and Respiratory Health Br, Div of Environmental Hazards and Health Effects, National Center for Environmental Health; and an EIS Officer, CDC. Editorial Note: The findings in this report project state-specific prevalence rates of 5.8% to 7.2%. These findings are consistent with those from a study in Oregon, which estimated asthma prevalence at 6%-7% (6). However, surveys of self-reported asthma prevalence in Bogalusa, Louisiana (7), Chicago, Illinois (8), and Bronx, New York (9) all indicated estimates considerably higher than those in this report. State program planners can use these findings to estimate the burden of asthma within their states.

The findings in this report are subject to at least two limitations. First, the findings assume a linear growth in asthma prevalence since 1995. Although this linear assumption was selected after review of regional growth trends in asthma prevalence during the preceding 15 years (2), changes in the trends of self-reported asthma rates that may have occurred in the 3-year interval during 1995-1998 could not be captured by these linear extrapolations. Second, these results are based on the assumption that age, sex, and race-specific rates of asthma do not vary within any of the four geographic regions of the United States. Each state's estimated prevalence reflects its regional placement in the United States and its demographic composition. These analyses do not account for differences among states in the relative presence or absence of environmental risk factors in asthma prevalence, possible differences in genetic susceptibility toward the condition, or other sociodemographic indicators (e.g., poverty status). As a result, these findings underestimate the variability in asthma prevalence between states within regions. They also do not accurately represent asthma prevalence in geographic subpopulations within states.

* Northeast—Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont; Midwest—Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin; South—Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia; West—Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Self-Reported Asthma Prevalence — Continued

TABLE 1. Forecasted estimates of self-reported asthma prevalence*, by state — United States, 1998

Region/State	No. cases	Estimated prevalence	(95% CI) [†]	Standard error
Northeast				
Connecticut	215,900	6.6%	(5.6%–7.5%)	7.2%
Maine	80,300	6.4%	(5.4%–7.4%)	7.8%
Massachusetts	401,000	6.5%	(5.6%–7.5%)	7.2%
New Hampshire	78,500	6.6%	(5.5%–7.6%)	7.8%
New Jersey	540,400	6.7%	(5.7%–7.6%)	7.2%
New York	1,236,200	6.8%	(5.8%–7.8%)	7.3%
Pennsylvania	800,900	6.6%	(5.6%–7.5%)	7.2%
Rhode Island	64,400	6.5%	(5.5%–7.4%)	7.3%
Vermont	39,500	6.5%	(5.5%–7.6%)	7.8%
Total	3,241,200	6.7%	(5.7%–7.6%)	7.3%
Midwest				
Iowa	190,100	6.6%	(5.6%–7.6%)	7.5%
Illinois	195,200	6.7%	(5.7%–7.6%)	7.5%
Indiana	398,400	6.7%	(5.7%–7.7%)	7.3%
Kansas	174,300	6.7%	(5.7%–7.6%)	7.3%
Michigan	642,300	6.7%	(5.7%–7.7%)	7.5%
Minnesota	318,600	6.7%	(5.6%–7.7%)	7.1%
Missouri	362,300	6.1%	(4.7%–7.4%)	11.3%
Nebraska	112,100	6.7%	(5.7%–7.7%)	7.4%
North Dakota	43,600	6.7%	(5.7%–7.6%)	7.3%
Ohio	748,200	6.7%	(5.7%–7.6%)	7.4%
South Dakota	51,000	6.7%	(5.6%–7.7%)	7.3%
Wisconsin	350,800	6.7%	(5.7%–7.7%)	7.2%
Total	4,187,688	6.6%	(5.6%–7.6%)	7.4%
South				
Alabama	280,500	6.0%	(4.8%–7.1%)	9.5%
Arkansas	182,600	5.9%	(4.9%–6.9%)	6.9%
District of Columbia	31,400	5.9%	(3.6%–8.2%)	19.7%
Delaware	44,300	5.9%	(4.9%–6.9%)	8.5%
Florida	863,900	5.8%	(4.9%–6.8%)	8.0%
Georgia	458,700	6.0%	(4.9%–7.2%)	9.7%
Kentucky	232,800	5.9%	(4.9%–6.9%)	8.2%
Louisiana	265,500	6.1%	(4.8%–7.3%)	10.5%
Maryland	307,300	6.5%	(5.6%–7.5%)	7.2%
Mississippi	167,900	6.1%	(4.7%–7.4%)	11.3%
North Carolina	447,200	5.9%	(4.9%–6.9%)	8.8%
Oklahoma	191,700	5.8%	(4.8%–6.7%)	7.9%
South Carolina	228,600	6.0%	(4.8%–7.2%)	10.1%
Tennessee	328,300	5.9%	(4.9%–6.9%)	8.3%
Texas	1,175,100	6.0%	(5.0%–7.0%)	8.2%
Virginia	403,400	5.9%	(4.9%–6.9%)	8.6%
West Virginia	108,600	5.8%	(4.9%–6.8%)	8.7%
Total	5,697,800	5.9%	(4.9%–7.0%)	8.8%
West				
Alaska	42,500	6.7%	(5.7%–7.7%)	7.7%
Arizona	316,200	6.9%	(6.0%–7.9%)	8.9%
California	2,268,300	7.1%	(6.1%–8.0%)	6.8%
Colorado	283,700	7.1%	(6.1%–8.0%)	6.8%
Hawaii	73,100	6.0%	(4.1%–7.8%)	15.3%
Idaho	86,100	6.7%	(5.7%–7.8%)	7.6%
Montana	61,600	6.6%	(5.7%–7.6%)	7.4%
Nevada	125,700	7.2%	(6.3%–8.1%)	8.4%
New Mexico	121,800	6.8%	(5.8%–7.8%)	7.2%
Oregon	225,900	6.9%	(5.9%–7.8%)	6.9%
Utah	141,200	6.7%	(5.6%–7.8%)	8.1%
Washington	391,900	6.9%	(5.9%–7.8%)	6.8%
Total	4,372,488	7.0%	(6.0%–8.0%)	7.0%
Total	17,291,000	6.4%	(5.5%–7.5%)	7.8%

*Persons were considered to have asthma if they had had asthma diagnosed by a physician at some time in their life and had reported symptoms of asthma during the preceding 12 months.

[†]Confidence interval.

Self-Reported Asthma Prevalence — Continued

Asthma is the ninth leading cause of hospitalization nationally (10). Its severity can be managed with appropriate medical treatment, education, and environmental modification (1). However, fewer than 10 states have conducted asthma prevalence surveys. The initiation of state-based asthma control and management programs will require better state and local data on asthma prevalence to evaluate the effectiveness of these programs. State-level surveillance could incorporate existing data such as hospital discharge data and managed-care data. Questions about asthma could also be added to state and community-level surveys such as the State and Local Integrated Telephone Survey and other surveys conducted in individual states such as the Behavioral Risk Factor Surveillance System.

State-based surveys should include questions related to asthma diagnosis, severity, management techniques, and known geographic and household risk factors. These surveillance data will provide a foundation for planning and evaluating asthma-control programs, identifying high-risk and hard-to-access populations, and structuring health promotion and education initiatives.

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Abortion Surveillance: Preliminary Analysis — United States, 1996

For 1996, CDC compiled data about legal induced abortions from the 50 states, New York City, and the District of Columbia. The total number of legal induced abortions was available from all reporting areas; however, not all areas collected information about the characteristics of women who obtained abortions. This report presents preliminary data for 1996; final abortion data for 1996 will be published during spring 1999.

In 1996, a total of 1,221,585 legal induced abortions were reported to CDC (Table 1), a slight increase of 0.9% from the number reported for 1995 (1). The number of live births decreased slightly by 0.2% during the same period (2). From 1995 to 1996, the

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ASTHMA MANAGEMENT WEBSITE ANNOUNCED BY NHLBI

Physicians who want to provide the most up-to-date diagnostic and treatment methods for their asthma patients can now find, on one online site, virtually all the scientific literature on chronic asthma that has ever been published. The new Web site is the Asthma Management Model System (AMMS), launched today by the National Heart, Lung, and Blood Institute (NHLBI) of the National Institutes of Health in recognition of World Asthma Day.

The AMMS was designed by the NHLBI's National Asthma Education and Prevention Program (NAEPP) to help improve the diagnosis and treatment of asthma. It is an interactive Web-based system that provides users with the ability to quickly formulate research questions and access key databases, retrieve the latest treatment guidelines and published literature, obtain continuing education credits, and browse and download materials. One of the striking features of the AMMS is its ability to bring together several high-tech functions within one integrated system for those clinicians who are on the cutting edge of asthma management.

Said NHLBI Director Dr. Claude Lenfant, "With its theme of 'Help Our Children Breathe,' World Asthma Day is an occasion on which we are communicating to people of all nations that asthma is a worldwide burden. The Asthma Management Model System provides an

important tool to help health care professionals, researchers, and public health planners at home and abroad reduce this burden."

The AMMS, which can be accessed through the NHLBI home page at www.nhlbi.nih.gov, provides a unique tool for health professionals who wish to analyze problems relating to long-term asthma management. After clicking on the research mode, the user can select search terms and the system automatically formulates a question that asks what effect a selected treatment will have on a selected outcome in asthma patients for whom selected conditions or factors are known. The system then retrieves the relevant information from such major scientific databases as MEDLINE, CRISP, and CORDIS, and documents from Federal government agencies like the Centers for Disease Control and Prevention and the Food and Drug Administration.

The AMMS also offers a professional education mode that provides immediate access to the latest asthma clinical guidelines from the NAEPP and the Global Initiative for Asthma, continuing medical education programs for physicians, other professional and patient education materials, and tools for physicians to teach other health professionals and patients about asthma.

Another major feature of the AMMS is a site that allows users to participate in online forums and discussions. This includes an Asthma Coalition Exchange, which is designed to foster information sharing and networking among community-based asthma coalitions throughout the country. The exchange is part of a larger NAEPP program to develop partnerships with local asthma coalitions to help implement change in the way asthma is managed at the community level.

It is intended that the AMMS will eventually connect to online forums and discussion

groups for asthma patients. Visitors will also be able to register for regular updates on new features that are added to the site.

The NAEPP was created in 1989 to reduce death and disability from asthma through professional, patient, and public education. It has developed the AMMS as an educational resource for health care professionals that should result in improvements in the way asthma is managed. Plans to expand patient and public education components are in development.

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**GLOBAL PLAN LAUNCHED TO CUT CHILDHOOD ASTHMA DEATHS BY 50%
Four US Organizations Part of Key Consortium: National Heart Lung Blood Institute,
American Academy of Allergy, Asthma & Immunology, American College of Chest
Physicians and the American Thoracic Society**

In Barcelona, Spain today at the World Asthma Meeting, international experts in asthma management called for global action to reduce childhood asthma deaths by 50%. The five-year effort, announced on the eve of the first ever World Asthma Day (December 11), aims to significantly reduce the mortality and morbidity associated with this disease. World Asthma Day is coordinated by GINA (Global Initiative for Asthma - established by the World Health Organization, and the NHLBI or US National Heart, Lung, and Blood Institute of the National Institutes of Health) and the European Respiratory Society. In addition to the NHLBI, official supporting organizations of World Asthma Day from the US are the American Academy of Allergy, Asthma and Immunology (AAAAI), the American College of Chest Physicians (ACCP) and the American Thoracic Society (ATS). Other international supporting organizations include the European Academy of Allergy and Clinical Immunology (EAACI) and the International Union Against Tuberculosis and Lung Disease (IUATLD).

Asthma is a chronic condition characterized by a narrowing of the bronchial tubes, swelling of the bronchial tube lining, and mucus secretion that can block the airway, making breathing difficult. The prevalence of asthma can be as high as 30 percent among certain populations, and internationally, cases have more than tripled in the last ten years. In the U.S.

between 1990 and 1994, the number of people reported to suffer from asthma increased from 10.4 million to 14.6 million with approximately 5.0 million of them children.

The theme of the inaugural World Asthma Day is **Help Our Children Breathe**. Globally, asthma is reported to be the single most common chronic disease causing absence from school, and 35% of children with asthma experience significant pain or discomfort as a result.

The **Agenda for Action**, announced today by Professor Romain Pauwels, chairman of GINA, calls for parents, physicians, public authorities and national organizations to work together to address childhood asthma and the following specified international targets by the year 2005:

- Reduce childhood asthma deaths by at least 50 percent.
- Cut the number of childhood hospitalizations due to asthma by at least 25 percent.
- Reduce the number of school days lost due to asthma by 50 percent.

Key short-term strategies to achieve the targets of the Agenda for Action include:

- **Inform and educate health authorities, physicians and families about effective management of childhood asthma.** Health authorities should be aware that they need to make sure access to a physician and/or specialist and appropriate treatment is available to all patients, regardless of socioeconomic status. Physicians need professional guidelines to properly diagnose and treat asthma. Families need to be educated on asthma treatments so that they are administered properly.
- **Increase the availability and accessibility of effective anti-asthma therapy for children.** There is ample evidence that effective anti-inflammatory therapy in asthma leads to an improvement in the quality of life for patients, a cost-effective reduction in morbidity, and reduction in the loss of school and work time, hospitalizations and deaths.
- **Support research into the understanding of the prevalence, causes and treatment of childhood asthma.** Epidemiological studies should be implemented to establish the prevalence and social impact of asthma in children. Research should concentrate on identifying the role of environmental factors; developing methodology for identifying asthma in children; studying the long-term effects of different therapies; assessing strategies to prevent asthma; and identifying the basic mechanisms underlying the development of allergic sensitization and chronic airway inflammation.

The NHLBI's National Asthma Education and Prevention Program (NAEPP) is the lead agency for US activities related to World Asthma Day. In recognition of World Asthma Day, the NAEPP is launching a new website (www.nhlbi.nih.gov) that provides a science-based decision-making tool, as well as an educational and communications resource, for health care professionals, researchers, public health planners, and others concerned about asthma.

The AAAAI web site provides an update on its national Pediatric Asthma: Promoting Best Practice initiative (www.aaaai.org). Information about asthma and other pulmonary diseases, as well as a link to the Chicago Asthma Consortium, is available on the ACCP website at www.chestnet.org.

In the US, many grassroots organizations dedicated to the support of asthma patients and their families will be hosting activities in commemoration of World Asthma Day. For information about local groups and activities, please call Lori Atkins at the ATS, or Abby Nash at the American Lung Association (212/315-6622).

Asthma Statistics

Global Figures:

- ▶ It is estimated that internationally, the prevalence of asthma has increased approximately 50 percent over the last ten to 15 years.
- ▶ The highest prevalence rates are found in the United Kingdom, New Zealand, Australia and Ireland; and the lowest are found in Indonesia, Albania, Romania and Georgia.
- ▶ Death rates vary in different countries. Death rates are decreasing in countries where anti-inflammatory medications are available and used effectively. Death rates are increasing in areas lacking proper medical care and access to treatments.

Asthma in the United States:

- ▶ According to 1995 data, the Centers for Disease Control estimates that there are nearly 15 million Americans with asthma. Of these, between five and six million are children.
- ▶ Prevalence by age group:

0-4 years old:	1,280,000
5-14	2,790,000
15-34	4,050,000
35-64	4,090,000
>65	770,000

- ▶ The rate of asthma among children five to 14 years of age increased 74% between 1980 and 1994; the rate of asthma among preschool children increased 160%.
- ▶ Asthma is the most common chronic illness leading to school absenteeism - it accounts for more than 10 million missed school days annually.
- ▶ An estimated \$1 billion is lost annually in productivity by working parents caring for children who miss school due to asthma.
- ▶ Asthma is the third leading-cause of hospitalization in children under age 15.
- ▶ Asthma is 26 percent more prevalent in black children than in white children.
- ▶ There are over 5,000 deaths annually due to asthma, and asthma-related deaths among children five to 14 years of age more than doubled from 1979 to 1995.
- ▶ Direct and indirect monetary costs related to asthma will total approximately \$11.3 billion in 1998.

The NHLBI is a part of the National Institutes of Health, and agency of the U.S. Department of Health and Human Services. Its major mission is to foster research investigations, train research scientists, and translate research results to impact on public health.

The AAAAI is the largest professional medical specialty organization in the United States, representing allergists, medical specialists, clinical immunologists, allied health professionals and others with a special interest in the research and treatment of allergic disease.

The ACCP is the leading resource for the improvement of cardiopulmonary health and critical care worldwide. Its 15,000 members encompass all the disciplines of chest medicine, including pulmonology, cardiology, thoracic surgery, asthma, immunology, critical care and pediatrics.

The ATS is an international professional and scientific society focussing on respiratory and critical care medicine. The Society has 12,500 members who help prevent and fight respiratory disease through research, education, patient care and advocacy. The American Thoracic Society also serves as the medical section of the American Lung Association, a voluntary health agency devoted to preventing lung disease and promoting lung health.

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NOTE: B-roll with animation of the airways constriction that occurs in asthma and footage of people from around the world undergoing examinations for asthma, taking asthma medications and other situations related to asthma is available from the NHLBI.