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# Chronic Care for Low-Income Children with Asthma: Strategies for Improvement

## Introduction

Many children with asthma do not get the care they need, despite the existence of asthma care guidelines and evidence about effective treatments. For example, the appropriate use of controller medications is very important in the treatment of asthma. By helping to reduce the underlying inflammation of the airways in a person with asthma, controller medications diminish asthma symptoms and prevent attacks. However, among children and adults with persistent asthma, approximately 29 percent are not receiving appropriate controller medications from providers, and some patients are not using the medications appropriately.[1] Among Medicaid-enrolled children with persistent asthma, the underuse of controller medications is widespread, reaching as high as 73 percent.[2] As a result, there are more acute episodes, greater use of emergency rooms and hospitals, and increased treatment costs.

Research has shown that reorganizing the way chronic care is delivered can increase the appropriate use of controller medications among children with asthma and have other positive results. Preliminary evidence also suggests that disparities in asthma care can be decreased through the use of strategies sensitive to the needs of racial and ethnic minorities.

This report provides promising strategies that could help policymakers and purchasers of health care and health insurance improve care for children with asthma. Other related topics discussed are:

- Patterns of use/underuse of controller medications.
- Effects of proper use of controller medications.
- Practices and policies used by managed care organizations (MCOs) and clinics and their effects on quality of care.

It is addressed to:

- Administrators of State Medicaid programs.
- Executives of Medicaid managed care organizations.
- Managers of provider organizations.
- Health plan executives.
- Employers who purchase health care for their employees.

**Making a Difference**


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**Note:** Bernard Friedman, Ph.D., made a significant contribution to this report.

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They may want to consider the strategies outlined in this report as they seek ways of providing higher quality care for children with asthma. Health care purchasers in the public and private sectors have the ability to use the contracting process to alter benefits or to add performance measures and set goals. Purchasers may want to consider modifying their benefit designs to cover an expanded emphasis on patient education strategies. Chronic care for low-income children with asthma can be improved if the information in this report is acted on.

## Background

Approximately 9 million children (12 percent of children under age 18) have been diagnosed with asthma, according to the 2002 National Health Interview Survey.[3] In 2002, health care costs for children with asthma in the United States totaled more than $6 billion.[4] Hospital stays are usually the most expensive form of medical care, and children age 17 and under are much more likely to be admitted to a hospital for asthma than are adults (27.5 per 10,000 vs. 12.7 per 10,000).[5] In fact, asthma admissions accounted for 7.4 percent (152,000) of all hospital admissions for children and adolescents in 2000.[6] Almost half of hospitalizations for asthma among children are billed to Medicaid.[6]

States are increasingly contracting with Medicaid managed care programs in various forms and giving them the responsibility for providing care to many Medicaid-enrolled children. Managed care, with its emphasis on the organization and coordination of care, has increased expectations about the quality of care that can be provided for those with asthma and other chronic conditions. At the same time, another feature of managed care, fixed prepaid budgets, has raised questions about the ability of these organizations to deliver on their promise.[7]

## Data on asthma care show gaps in quality

Asthma care guidelines and evidence about effective treatments are available. The National Asthma Education and Prevention Program (NAEPP) Expert Panel issued its revised Guidelines for Diagnosis and Management of Asthma (EPR-2) in 1997 and an Update in 2002.[8] However, many children with asthma do not get the care they need.

In addition, even when providers deliver appropriate care, children may not be using controller medications correctly because their parents do not understand the purpose of the medication.[9] According to the 2004 survey on the quality of care in commercial managed care plans from the National Committee for Quality Assurance, about 29 percent of children and adults (ages 5-56) with persistent asthma are not receiving inhaled corticosteroids to control their condition.[1] The problem of underuse was even more serious among children with persistent asthma enrolled in Medicaid managed care, according to researchers from the Asthma Care Quality Assessment (ACQA) Study (Box 1). In 1999, these children experienced a very high rate (73 percent) of underuse of controller therapy, with 49 percent of parents reporting no controller use and 24 percent reporting less than daily use.[a,2]

A related issue is the significant racial/ethnic disparities in asthma status and home management practices. For example, African-American and Hispanic children with similar insurance and sociodemographic characteristics have more severe asthma than white children based on number of symptom days, school days missed, and health status scores. Also, compared to white children, in 1999 African-American and Hispanic children were 31 percent and 42 percent less likely, respectively, to be using controller medications (including inhaled corticosteroids).[10] Finally, African-American children are about three times as likely to be admitted to a hospital for asthma as white children.[11]

[a] The statistics, based on reports by parents not confirmed by review of medical records, do not separate the effects of inadequate prescribing of controller medications from inadequate patient adherence to prescribed preventive regimens.

**Box 1. Asthma Care Quality Assessment Study (ACQA)**

*Asthma Care Quality in Varying Managed Care Medicaid Plans.* Harvard Medical School. Grant No. U01-HS09935. 1998-2003. ACQA, a project jointly funded by the Agency for Healthcare Research and Quality, the American Association of Health Plans Foundation, and the Health Resources and Services Administration, investigated patterns of asthma-related health care for Medicaid-insured children in five geographically dispersed not-for-profit managed health care plans, including three group-model health maintenance organizations and two Medicaid managed care organizations. A series of papers have been published based on the findings of this study.

## Successful asthma management

Successful management of asthma has four basic components:

1. Reducing or controlling exposure to environmental triggers.
2. Objective monitoring of the condition by patient and provider.
3. Taking appropriate medications as indicated.
4. Active involvement of the patient in managing the disease.

The last component—patient self-management (and, in the case of children, family management)—is critical to the other three. People with persistent asthma need long-term controller medications. The treatment of choice for the most effective long-term control of asthma is inhaled corticosteroids. This may be supplemented by long-acting beta-agonists in cases of moderate to severe persistent asthma. Other controller medications include leukotrine modifiers, cromolyn, nedocromil, and theophylline. Long-term controller medications are taken every day, usually over long periods of time, to control chronic symptoms and to prevent asthma episodes or attacks.[8]

### Increasing use of controller medications improves outcomes

In its systematic review of research on the management of chronic asthma, an Evidence-based Practice Center (EPC) reported that the regular use of inhaled corticosteroids improves long-term outcomes for children with mild to moderate asthma .[b,12] This systematic review also found that regular use of controller medications reduced hospitalizations. A similar effect was observed in a study conducted among children enrolled in three MCOs.[13] This study found that children receiving controller medications were only 40 percent as likely to have emergency department visits or hospitalizations compared with children who did not receive such medications.

[b] Under AHRQ's Evidence-based Practice Centers (EPC) Program, 5-year contracts are awarded to institutions in the United States and Canada to serve as EPCs. The EPCs review all relevant scientific literature on clinical, behavioral, and organization and financing topics to produce evidence reports and technology assessments. These reports are used for informing and developing coverage decisions, quality measures, educational materials and tools, guidelines, and research agendas.

### Specialist and followup visits are linked to controller medication use

The ACQA study mentioned earlier found that Medicaid-insured children with asthma who received specialist visits or followup appointments were more likely to use appropriate controller medications.[2] One possible reason for this is that specialists may be more likely to have systems allowing for more effective patient education. Other reasons are that patients seeing specialists may have more severe disease or be more motivated to follow their physician's guidance.

### Patient education and self-management are related to organization of care

Given the complex and chronic nature of asthma and the importance of routine patient self-management (e.g., appropriate use of controller medications, identification of symptoms of an exacerbation, avoidance of environmental triggers), patient education for self-management has been strongly recommended. However, the evidence for specific measures can be unclear. For example, the EPC report mentioned earlier[12] determined that the evidence on the effectiveness of written asthma treatment plans distributed to the patient was inconclusive. Positive results may depend on how the education is delivered.[c] Patient education is linked to the way in which asthma care is organized within each practice.

The Pediatric Asthma Care Patient Outcomes Research Team (PAC PORT) study (Box 2) used a Planned Care Model to better organize asthma care by combining nurse-mediated organizational change and physician peer leader education. This model was found to be effective in improving asthma care in the primary care setting within managed care.

The Planned Care Model in this study was based on the Chronic Care Model developed by Wagner and colleagues.[14,15] The core of the Planned Care Model consisted of visits with an asthma nurse trained in the NAEPP guidelines and in self-management support. Part of this training involved learning how to use techniques

[c] The NAEPP continues to recommend the use of written treatment plans as part of the treatment protocol.

drawn from motivational interviewing and problem-solving therapy to improve self-management in pediatric chronic illness care.[d] The nurse provided standardized assessments, care planning, coordination with the primary care provider, and self-management tools for the patients and their families.

The peer leader education component consisted of training one pediatrician per practice in asthma guidelines and peer teaching methods. This pediatrician served as an asthma expert who provided support, education, and feedback to other members of the practice related to their asthma management. This component was more effective when combined with the asthma nurse visits. Children receiving care through practices relying on both peer leader education and visits with a trained asthma nurse had 13 fewer symptom days annually and a 39-percent lower oral steroid burst rate per year relative to usual care.[e,16] In a followup cost-effectiveness study, the researchers found that the additional incremental cost for each of the 13 symptom-free days was $68.[17]

## Care is affected more by practice site than MCO

The ACQA study investigated the extent to which MCOs and their affiliated practice sites consistently used 27 different processes of asthma care. These processes of care included promoting self-management support by teaching spacer technique[f] and strengthening delivery systems by using asthma nurses or other managers. The policies and practices selected for study were adapted from the Assessment of Chronic Illness Care, a tool for assessing processes of chronic illness care that is based on the Chronic Care Model.[18] These processes have been shown to be associated with high-quality asthma care or in a more general sense, high-quality chronic illness care.[14] Many of them are included as components of quality care in the NAEPP Expert Panel Report cited earlier.[8]

Clinicians at 73 practice sites (including community health centers, solo and specialty practices, multispecialty group practices, and academic health centers) completed a survey to assess how frequently their practices were using these processes of asthma care for poor populations. After analyzing the results of the survey, ACQA researchers found that Medicaid MCOs do not consistently influence the processes of asthma care used by their associated practice sites.[19] The practice sites overall scored well on some processes of care. For example, 84 percent facilitated specialist referral for difficult cases and 90 percent ensured primary care followup after an urgent care visit. However, the researchers found wide variability among most processes of care from practice site to practice site.[g]

MCOs appeared to exert a moderate to strong influence on their affiliated practice sites with respect to only five processes of care, three of them related to information systems (Table 1). For example, a strong relationship was found between MCOs and affiliated practice sites for the use of registries and reports. Two processes of care were strongly related to the MCOs: ensuring primary care followup after an urgent care visit and use of asthma nurses or other case managers. In general, sites were less likely to emphasize processes of care related to self-management support and information systems and more likely to emphasize processes of care related to delivery system design and decision support.

## Cultural competence and reports to physicians can improve care

The ACQA researchers also surveyed practice sites to determine the prevalence of certain practices and policies especially associated with quality care for poor and minority children. Their objective was to examine associations between those practices and policies and the quality of care for Medicaid-insured children with asthma.[20]

[d] Motivational interviewing is designed to strengthen a person's commitment to changing behavior by focusing on such factors as desire, self-efficacy, need, readiness, and reasons.

[e] When a patient has an acute attack that does not respond to the usual asthma medications, an oral corticosteroid may be prescribed in a high dose for a few days. This treatment is known as steroid burst.

[f] A spacer is a long tube that slows the delivery of medication from pressurized metered dose inhalers. Some instruction in its proper use is required.

[g] Another study found that there were significant differences across three MCOs in the proportions of patients dispensed controller medications. It did not relate these differences to differences in processes of care, structures of care, or patient outcomes.[13]

**Table 1. Asthma processes of care moderately to strongly correlated within the managed care organization and their frequency of use in Medicaid managed care practice sites**

| Care process | Percent usually or always using process |
|---|---|
| **Delivery System Design** | |
| Ensure primary care followup after urgent care visit | 90 |
| Use asthma nurses or other case managers | 42 |
| **Information Systems** | |
| Give feedback reports to providers to improve asthma care | 30 |
| Provide registries to clinicians | 14 |
| Use registries to prompt clinicians regarding guidelines | 21 |

**Source:** Lozano P, Grothaus LC, Finkelstein JA, et al. Variability in asthma care and services for low-income populations among practice sites in managed Medicaid systems. Health Serv Res 2003; 38 (6 Pt I):1563-78.

Cultural and linguistic competence is the ability of health care providers and health care organizations to understand and respond effectively to the cultural and linguistic needs brought by the patient to the health care encounter. Cultural competence policies included:

- Recruiting ethnically diverse nurses and providers (71 percent of practices).
- Attempts to minimize cultural barriers through printed materials (48 percent).
- Offers of cross-cultural or diversity training (39 percent).
- Offers to providers of training to develop communication skills (24 percent).
- Evaluation of the level of cultural competence among providers (15 percent).

Also included in the survey were different types of reports to physicians such as:

- Lists of asthma patients (15 percent).
- Asthma registries to prompt physicians about appropriate medications or services (22 percent).
- Reminders about asthma guideline adherence for individual patient encounters (34 percent).
- Feedback reports to improve performance in asthma care (30 percent).

The researchers found that both cultural competence practices and the use of reports to physicians were associated with less underuse of controller medications, better asthma physical status at followup, and better parent ratings of care. In addition, access to and continuity of care were also associated with better outcomes.

## What can be done to improve care?

The ACQA study concluded that MCOs participating in Medicaid could play a greater role in improving asthma care processes at practice sites if they placed greater emphasis on improving information systems and self-management support services. In addition to the organizational changes discussed earlier in the Planned Care Model intervention, other interventions to improve professional and patient education and control of environmental asthma triggers might also have positive impacts. Several examples of successful interventions reported on in recent studies are discussed below:

- A social-worker-based program involving asthma education and control of environmental asthma triggers (Box 3).
- An interactive seminar for physicians based on self-regulation theory (Box 4).
- A training program for intervention staff in public health clinics (Box 5).

The National Cooperative Inner-City Asthma Study (NCICAS) shows that a multifaceted program that includes social-worker-based asthma education, case management, and home-based interventions to control environmental asthma triggers can reduce asthma symptoms among inner-city children, especially those with more severe asthma. The increase in costs was modest: when compared with usual care, the intervention improved outcomes at an average individual cost of $9.20 per symptom-free day. In this intervention, social workers functioned as case managers.[21]

Self-regulation theory focuses on the ways in which people direct and monitor their activities and emotions in order to attain their goals. Studies found that a two-session interactive seminar for physicians using this theory to assist

in altering physician treatment practices resulted in more children being placed on inhaled corticosteroids. This regimen, coupled with physician education in communication and education techniques, resulted in significantly fewer symptoms and fewer followup office visits, non-emergency physician office visits, emergency department visits, and hospitalizations in the treatment group compared to controls. The effects of the physician education persisted over 2 years, and treatment group physicians expended no more time with their patients than controls. Children of younger single mothers reaped the greatest benefit from the physician education.[22, 23]

A study focused on professional education in public health clinics found that improvements could be obtained only by combining the provision of sufficient equipment and prescription drugs with seminars for providers, all other clinic staff, and administrators. As a result, clinics were able to substantially increase the percentage of patients receiving both inhaled anti-inflammatory and beta-agonist medications over a 2-year period.[24]

## Ongoing research

Other approaches to asthma care improvement for children funded by the Agency for Healthcare Research and Quality (AHRQ), some of which focus on low-income children, are being tested in community health centers and in Head Start programs.

*Better Pediatric Outcomes Through Chronic Care.* University of Connecticut. Grant No. U18 HS11068-01. This study, focusing on poor, minority, inner-city children with asthma, is developing and testing the use of provider prompts on guideline recommendations at the point of care using affordable information technology. It also provides and tests a family-focused supportive educational intervention delivered by a community health worker.

*Managed Care Organization Use of a Pediatric Asthma Management Program.* University of Connecticut. Grant No. U18 HS11147. This study, also focusing on inner-city children, tests an asthma management program for its reproducibility, effectiveness in adherence to guidelines, and cost burden on an MCO.

*Developing an Asthma Management Model for Head Start Children.* Arkansas Children's Hospital, Little Rock. Grant No. U18 HS11062-01. This study is testing a multifaceted case-management model implemented by Head Start personnel for its effects on school absence, acute care utilization, and asthma management practices of children, parents, and staff.

*Developing an Asthma APGAR.* Olmsted Medical Group. Grant No. R03-HS14476. This project collaborates with rural practice-based research network physicians using participatory action research to modify and validate the asthma APGAR, an asthma severity index developed by the principal investigator. The practice asthma APGAR is used to provide targeted feedback to physicians and practices to guide activities oriented toward translating research into practice. After assuring face validity, the study will assess the effectiveness of the practice asthma APGAR in helping providers identify gaps in asthma care and develop simple implementable solutions for those gaps. Finally, the researchers will evaluate the potential of spreading use of the tool to other rural practices.

*Telephone-Linked Communications for Asthma.* Boston Medical Center. Grant No. R01-HS10630-01. The goal of this project is to develop and evaluate an education and monitoring system for children with asthma. TLC-Asthma is a computer-based telecommunications system that will give guidance on asthma management to families and collect information to share with each family's primary care provider on the problems and successes the family is having managing the child's asthma.

## Conclusion

Studies show underuse of controller medications among children with asthma and higher rates of negative patient outcomes associated with such underuse. In addition, significant disparities in asthma care exist among minority children. Higher quality asthma care for Medicaid-insured children is associated with practice-site policies to support cultural competence, reports to clinicians, and access and continuity of care. Research also shows that processes of asthma care for children enrolled in Medicaid managed care vary more by practice site than by health plan. MCOs participating in managed Medicaid could play a greater role in improving asthma care processes at practice sites if they placed greater emphasis on improving information systems and self-management support services. Also, some of the intervention strategies found to be successful in studies could be helpful in improving asthma care. Public and

private payers such as State Medicaid programs might want to consider encouraging MCOs and patients to implement one or more of these interventions.

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**** AHRQ-funded/supported research***

**Box 2. PAC PORT Planned Care Model**

**Nurse-mediated change**

Four or five visits per year with a trained asthma nurse who conducts assessments are planned for asthma patients and family members.

Nurse activities (patient visits, etc.) include:

- Assessment of asthma symptoms, medication use, environmental control, and self-management skills. (The nurse shares a computer-generated report of findings with the child's physician.)
- Self-management support to families regarding medication adherence, technical skills, and environmental triggers, using problem-solving and motivational techniques.
- Proactive standardized telephone followup between visits.
- Support and participation in care planning (including medication and environmental measures) in conjunction with primary care providers, using the Expert Panel Report-2 (EPR-2), with emphasis on the use of controllers for persistent disease.
- Arranging for allergists to visit the primary care site for case discussions.
- Other activities including reviewing with physicians quarterly registry-based asthma panel reports (on medication use and emergency department visits).

Asthma nurse training includes:

- Training in NAEPP's EPR-2 and in self-management support techniques.
- Full-day training session to learn motivational enhancement and problem-solving techniques.
- Meetings weekly or every other week for 10 weeks for 1-hour conference calls to review written materials.

**Peer leader education**

One primary care provider per practice is trained in asthma guidelines and peer teaching methods.

Training emphasizes asthma pharmacotherapy and physician behavior change strategies.

Training includes two workshops, central support by an educational coordinator, and an ongoing learning network for peer leaders via national and local teleconferences.

Peer leader education provides ongoing support for physicians in their role as change agents.

**Note:** PAC PORT is Pediatric Asthma Care Patient Outcomes Research Team. NAEPP is the National Asthma Education and Prevention Program.

**Source:** Lozano P, Finkelstein JA, Carey VJ, et al. A multi-site randomized trial of the effects of physician education and organizational change in chronic asthma care. Health outcomes of the Pediatric Asthma Care PORT study. Arch Pediatr Adolesc Med 2004 Sep; 158(9):875-83.

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**Box 3. National Cooperative Inner-City Asthma Study Intervention**

This is a comprehensive social-worker-based education program combined with environmental control.

- Social workers were trained as asthma counselors (ACs) over a 3-month period.
- Training included three separate $2^1/_2$-day sessions plus attending local asthma clinics for at least 2 weeks.
- ACs worked with child's caretaker to improve communications between family and physician.
- Primary care physicians were sent a blank asthma care plan, a spacer, a peak flow meter, and National Heart, Lung, and Blood Institute's asthma treatment guidelines.
- Caretakers attended two adult group asthma education sessions and one individual meeting with their AC during the 2 months after baseline assessments.
- Group sessions covered asthma triggers, environmental controls, asthma physiology, strategies for problem solving, and communicating with their child's physician.
- Two group sessions for children were conducted during the next 2-month period.
- ACs met with caretakers in person every 2 months and spoke with them on the telephone on alternate months.
- Families were given pillow and mattress covers and were encouraged to minimize exposure to tobacco smoke and pets.
- All children participating were given comprehensive 2-hour baseline assessments regarding health status, asthma symptoms, use of health care services, and psychological status.

**Source:** Sullivan SD, Weiss K, Lynn H, et al. The cost-effectiveness of an inner-city asthma intervention for children. J Allergy Clin Immunol 2002; 110(4):576-81.

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**Box 4. Interactive seminar for physicians based on self-regulation theory (Physician Asthma Care Education: PACE)**

Physicians were helped to observe, evaluate, and react to their own efforts to treat and educate their patients. The purposes of the seminar were to:

- Help physicians create interactive conversation with patients to derive information for making therapeutic decisions.
- Create a congenial and supportive atmosphere so that patients would be candid.
- Reinforce positive efforts of families to self-manage.
- Provide a supportive climate for mutual problem-solving.
- Strengthen patients' skills in using medicines.
- Provide the patient with a view of the long-term therapeutic plan.
- Build patients' confidence to control symptoms.

The program had two components: optimal clinical practice based on National Asthma Education and Prevention Program guidelines, and patient teaching and communications.

There were two $2^1/_2$-hour seminars 2-3 weeks apart. The seminars included:

- Brief lectures on clinical practice by respected asthma specialists.
- A video depicting effective clinical teaching and communication behavior.
- Case studies presenting troublesome clinical problems.
- A protocol by which physicians could assess their own behavior regarding patient communications.
- A review of messages to communicate and materials to use when teaching patients.

The topics included:

- What happens in an asthma attack.
- How medicines work.
- Responding to changes in asthma severity.
- How to take medicines.
- Safety of medicines.
- Goals of therapy.
- Criteria of successful treatment.
- Managing asthma at school.
- Identifying and avoiding triggers.
- A long-term treatment plan showing patients at home how to adjust medications.

**Source:** Clark NM, Gong M, Schork A, et al. Impact of education for physicians on patient outcomes. Pediatrics 1998; 101(5):831-6.

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**Box 5. Creating a Medical Home for Asthma: Professional education in public health clinics**

The purposes of the program are:

- To help staff link the goals of continuing care for asthma to the preventive care mission of the clinics.
- To help staff resolve organizational problems blocking acceptance of the new approach to asthma care.
- To build teamwork and a sense of owning the program by involving staff in planning how to implement the program in each clinic.

The program has three main components:

1. Training sessions for all clinic staff.

- Five 3-hour sessions over a 5-month period were attended by all clinic staff. Emphasis was placed on defining the roles of clerks, public health assistants, and lab technicians and teaching them to answer questions and encourage compliance.
  - Session 1 introduced the Creating a Medical Home for Asthma Program and asked clinic staff to assess assets and barriers to implementing the program.
  - Session 2 used a skit written by faculty and performed by staff showing how the program would work and also introduced an interactive exercise called "force field analysis" to help clinic teams plan how to start the program in each clinic.
  - Session 3 introduced prevention and treatment protocols based on the National Asthma Education and Prevention Program Guidelines.
  - Session 4 modeled optimal communication skills for medical interviews and family education using videotapes showing a faculty doctor and nurse conducting an initial visit for asthma with a patient.
  - Session 5 introduced a screening process to identify children with asthma and invite them to receive treatment in the clinic.
- Two additional 3-hour sessions were held at the end of the first followup year to reinforce communication skills and discuss patients they had worked with.

2. Tutorial session for each clinic physician. Each clinic physician spent 3 hours observing a Columbia University faculty physician treating children with asthma in a hospital setting.

3. Visits by a full-time nurse educator. Once a month, a nurse educator visited to help solve problems and continue the educational process.

In addition to this training, all clinics received appropriate medications and delivery devices.

**Source:** Evans D, Mellins R, Lobach K, et al. Improving care for minority children with asthma: professional education in public health clinics. Pediatrics 1997; 99(2):157-64.

**The program can be accessed** on the New York City Department of Health Web site at: http://www.nyc.gov/html/doh/html/cmha/index.html. Accessed on March 9, 2005.

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