

# Translation of a Pediatric Asthma-Management Program Into a Community in Connecticut

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**WHAT'S KNOWN ON THIS SUBJECT:** Despite the initial release of the National Asthma Education and Prevention Program asthma guidelines in 1991, primary care clinicians do not adhere to the guidelines and continue to underdiagnose and undertreat asthma in children.



**WHAT THIS STUDY ADDS:** An asthma-management program was transferred to 5 communities in Connecticut and resulted in reduced medical services utilization. The study's results demonstrate that pediatricians can use guidelines, and, when used, guidelines are effective in reducing medical services utilization for Medicaid-insured children.

## abstract



**OBJECTIVES:** We assessed whether a successful asthma-management program could be translated into pediatrician's offices, improve care, and reduce medical services use.

**METHODS:** Pediatrician's offices from 6 communities in Connecticut were trained, and all children aged 6 months or older were eligible for enrollment. Quality measures included enrollment numbers, appropriate use of anti-inflammatory therapy, and distribution of a written treatment plan. Medical services utilization data for Medicaid-insured children were expressed as relative rates (RRs) (95% confidence intervals [CIs]) before and after enrollment, and we used historical and contemporaneous comparisons and generalized estimating equations.

**RESULTS:** A total of 51 practices and 297 clinicians enrolled 32 680 children from 2002 to 2007; 10 467 had asthma, of whom 4354 were insured with Medicaid. Children with persistent asthma experienced decreases in the number of hospitalizations (RR: 0.51 [95% CI: 0.39–0.65]) and emergency-department visits (RR: 0.70 [95% CI: 0.68–0.84]), and there was no change in number of outpatient visits (RR: 0.99 [95% CI: 0.9–1.10]). Inhaled corticosteroid use doubled, appropriate use of anti-inflammatory therapy increased to 96%, and 94% of the children were given a written treatment plan.

**CONCLUSIONS:** General pediatricians can successfully implement an asthma-management program that is effective in improving care for large numbers of children. *Pediatrics* 2011;127:11–18

Guidelines for asthma management have been widely distributed by the National Asthma Education and Prevention Program.<sup>1–3</sup> Adoption of these guidelines by specialists is high and significantly higher than adoption by primary care clinicians<sup>4,5</sup>; underdiagnosis and undertreatment are major obstacles to asthma management by many primary care clinicians.<sup>3,6</sup> Underuse of inhaled corticosteroids and the absence of a written treatment plan, especially in Medicaid-insured populations, have been cited as indicators of inadequate asthma management.<sup>7–11</sup> As a consequence, asthma morbidity remains high and is continuing to increase for many children, especially minority children who reside in underserved communities.<sup>12</sup>

Easy Breathing is an asthma-management program for primary care clinicians that translates key elements of the National Asthma Education and Prevention Program guidelines into an efficient, effective, user-friendly format.<sup>13</sup> Implementation of Easy Breathing has improved asthma diagnosis and use of anti-inflammatory therapy for children with persistent asthma and has resulted in sustained reductions in medical services utilization for children cared for in both urban-based clinics and private practices.<sup>14,15</sup> In addition, Easy Breathing is cost-effective; in a Medicaid-insured population in Hartford, Connecticut, Easy Breathing implementation resulted in a potential return on investment of \$3.58 per child with asthma per year to the payer.<sup>16</sup>

On the basis of the program's success in urban-based clinics in Hartford and in 20 private practices in the surrounding communities, the state of Connecticut funded the expansion of Easy Breathing into 5 new communities in Connecticut to determine whether the program could be successfully replicated and transferred into a community setting under local leadership.

We determined whether this asthma-management program would be adopted by the local pediatric community and whether it would be successful in reducing the number of hospitalizations and emergency-department visits for children with asthma.

## METHODS

### Community Identification and Program Training

Five cities in Connecticut (Bridgeport, East Hartford/Manchester, New Britain, New Haven, and Waterbury), and Hartford, were targeted for program (Easy Breathing Community Initiative) implementation by the Department of Public Health on the basis of the number of Medicaid and Husky A (Connecticut's State Children's Insurance Program) enrollees and rates of health care utilization for children with asthma. Local health departments, community health centers, and hospitals were invited to participate. Subcontracts were established at 6 fiduciary sites (2 health departments and 4 hospitals). With assistance from the Asthma Center at Connecticut Children's Medical Center, each community site recruited a physician champion, a program coordinator, and a data-entry person. Physician champions included a pediatric allergist, a pediatric pulmonologist, 3 general pediatricians in private practice, and 1 hospital-based general pediatrician. Program coordinators included 1 nurse, 1 social worker, and 4 people with a master's degree in public health. Overall project direction was provided by the Asthma Center and included a pediatric pulmonologist, a coordinator, a database manager, and a senior statistician.

Community personnel were trained (a full day for program coordinators and data-entry personnel and a half-day for physician champions) for the Easy Breathing program by Asthma Center

staff and were given master copies of all project-related materials. Strategies for engaging the pediatricians in their community were discussed, and a list of practices was provided. Weekly conference calls with program coordinators facilitated program implementation. Quarterly dinner meetings were held with physician champions, program coordinators, and representatives from the Department of Public Health to review program activity and results and discuss strategies for overcoming barriers. Community requests for additional materials were handled by the Asthma Center, and materials were distributed to all of the communities to ensure standardization. All community-based program staff, including the physician champions, were compensated for their effort.

### Practices and Clinics

Physician champions contacted potential practices either by telephone or letter. Follow-up was then provided by the program coordinator who discussed the program with practice/clinic staff. Practices were subsequently trained by the physician champions for the Easy Breathing program over lunch time. All members of the practice, in addition to the clinicians, participated in the training. The program coordinators assisted the practices with program start-up and then visited the practices every 1 to 2 weeks to review treatment plans, provide immediate feedback, and maintain program supplies. Quarterly, the Asthma Center provided each community with a general newsletter and practice-specific feedback. Remediation, when needed, was provided by the physician champion.

### Participants

All children 6 months to 18 years of age who presented to an Easy Breathing Community Initiative–participating pe-

diatrician's office for medical care regardless of the chief complaint between July 1, 2002, and June 30, 2007, constituted the eligible sample. The study was approved by the institutional review board at Connecticut Children's Medical Center and by community institutional review boards, as required.

### Easy Breathing

The Easy Breathing program has been described previously.<sup>13,14</sup> Between 2002 and 2007, the program consisted of 5 elements: an Easy Breathing survey composed of 4 validated questions that guided physicians in diagnosing asthma<sup>17</sup>; a provider assessment composed of 4 questions that guided the clinician in determining asthma severity<sup>18</sup>; a treatment-selection guide that listed asthma medications, appropriate dosaging, and insurance coverage according to asthma severity for daily, sick, and emergency use; and a simple, field-tested written asthma-treatment plan (in multiple languages) that is given to every child with asthma.<sup>19</sup> Over time, at the request of participating practices, additional materials were provided, including educational materials and instructions in environmental triggers and their control. In addition, practices could order allergy skin testing and spirometry testing, which was performed at the Asthma Center in Hartford. All project forms used carbonless paper, and a copy was used for local data entry. The data were then deidentified and sent to the Asthma Center for collation and reporting to the Department of Public Health.

### Sources of Data

Patient demographics and exposure histories were obtained from the Easy Breathing survey. Asthma severity and medications were obtained from the provider assessment and asthma-treatment plans, respectively. Medicaid claims data and eligibility files

were obtained from the Department of Social Services' Medicaid vendor. Asthma drugs were identified by using National Drug Codes and grouped into 5 categories: short-acting bronchodilators; inhaled corticosteroids; leukotriene modifiers; mast-cell agents; and oral steroids.

### Statistical Analyses

$\chi^2$  analysis was used to compare demographic information. Exposures were compared by using  $\chi^2$  analysis, and odds ratios were calculated by using multivariate logistic regression. Medical services utilization including hospitalizations; emergency-department and outpatient visits, for which the primary diagnosis was asthma; and filled prescriptions for asthma medications were examined through the analysis of paid claims for the Medicaid-insured children who were enrolled in Easy Breathing between July 1, 2002, and June 30, 2007. The results from these analyses are expressed as relative rates of utilization (in units of events per child per year of eligibility) of these services by children after enrollment in the Easy Breathing program compared with the rates for the same children before enrollment.

Children were continuously enrolled in the Easy Breathing Community Initiative between 2002 and 2007. Each child contributed 1 month of person-time to the analysis for every month of Medicaid eligibility at any point during the 5 years of data analysis regardless of whether they had been enrolled in Easy Breathing at the time of the claim. Thus, at any point in time, there were children already enrolled in Easy Breathing as well as children not yet enrolled; all of these children contributed person-time (and possibly incident events such as hospitalizations) to the analyses. In the comparisons we then estimated utilization by pooling the person-time and events of all children after enrollment and compared

them with utilization rates calculated by pooling the person-time and events of all children before enrollment. Therefore, the comparisons were both historical, using each child's entire utilization experience after and before enrollment, and contemporaneous, using the utilization of all children enrolled at a given time along with all children yet to be enrolled.<sup>14</sup>

Because children could contribute time to both the preenrollment and the postenrollment periods, the preenrollment and postenrollment utilizations for an individual child were not independent. Thus, marginal Poisson regression models fit by using generalized estimating equations were used to estimate relative rates of utilization. In all analyses we controlled for gender, ethnicity, asthma severity, calendar year and season, and the aging of the cohort to account for the uneven distribution of asthma rates according to these variables.

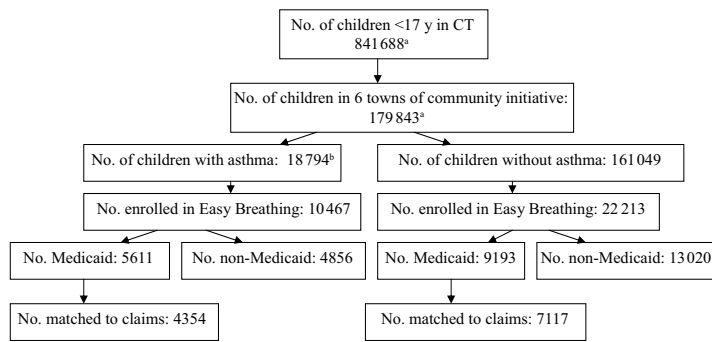
## RESULTS

### Practices and the Communities

Between July 1, 2002, and June 30, 2007, 62 practices in 17 towns and cities in Connecticut were invited, and 51 (82%) were trained in the Easy Breathing program. Of 297 clinician participants, 184 were physicians and 113 were midlevel practitioners (advanced-practice nurses, pediatric nurse practitioners, and physician assistants).

### Study Population

In 2002, 140 395 children (aged <21 years) in Connecticut were enrolled in Medicaid/Husky A, of whom 11 416 received care for asthma (Connecticut Voices for Children). Medicaid/Husky A-enrolled children were black (29%) or Hispanic (42%) and had high rates of asthma-related emergency-department visits (29% for a total of 4709 emergency-department visits) and hospitalizations (4.3% were hospi-



**FIGURE 1**

Source of the study population from all children aged less than 17 years in Connecticut. The study population consisted of 11 471 children who were insured by Medicaid and matched to their claims data from 2002 to 2007. <sup>a</sup> 2000 US Census; <sup>b</sup> Connecticut Voices for Children 2000 and 2006 report.

talized 643 times for asthma) and low rates of filled prescriptions for anti-inflammatory drugs (18%). Of the total number of Medicaid/Husky A children in Connecticut, ~50% reside in 1 of the Easy Breathing Community Initiative–participating communities.

Between July 1, 2002, and June 30, 2007, 32 680 children were enrolled in the Easy Breathing Community Initiative, of whom 10 467 had physician-confirmed asthma. The demographics of children enrolled in the Easy Breath-

ing Community Initiative were similar to those of the children who were residing in these communities, except that enrollees were more likely to be Hispanic.

Of the total number of children enrolled in the Easy Breathing Community Initiative, 14 804 were enrolled in Medicaid/Husky A and 11 471 (77%) were matched to their claims. These 11 471 children constitute the study population (Fig 1). Compared with non-Medicaid-insured children en-

rolled in Easy Breathing in these communities, Medicaid-insured children were younger ( $P < .0001$ ), more likely to be either Hispanic or black ( $P < .0001$ ) (Table 1), more likely to have persistent asthma ( $P < .0001$ ), and more likely to report greater exposure to environmental tobacco smoke ( $P < .0001$ ), cockroaches ( $P < .0001$ ), gas stoves ( $P < .0001$ ), and rodents ( $P < .0001$ ) but less likely to report exposure to pets (dogs and cats) ( $P < .0001$ ) (data not shown).

### Asthma in the Medicaid Population

Of 11 471 Medicaid/Husky A–insured children enrolled in the Easy Breathing program with matched claims, 4354 children had a physician-confirmed diagnosis of asthma; 38% had newly diagnosed asthma (ie, parent denied a previous diagnosis and the child had never been treated for asthma, but a clinician determined that the child has asthma) and 50% had persistent asthma (Table 1). In the unadjusted analysis, Medicaid/Husky A–insured children with asthma were more likely

**TABLE 1** Demographics of the Study Population

Characteristic	Total Community Initiative Enrollees, n (%)	Community Initiative Enrollees With Asthma, n (%)	Total Medicaid Community Initiative Children Matched to Claims, n (%)	Medicaid Community Initiative Children Matched to Claims With Asthma, n (%)
<i>n</i>	32 680	10 467	11 471	4354
Gender				
Male	16 570 (51)	5796 (55)	5923 (52)	2400 (55)
Female	15 888 (49)	4598 (44)	5548 (48)	1954 (45)
Unknown	222 (1)	73 (1)	—	—
Ethnicity				
Hispanic	10 038 (31)	4085 (39)	5641 (49)	2376 (55)
Black	5492 (17)	2054 (20)	2858 (25)	1076 (25)
Non-Hispanic white	13 190 (40)	3085 (29)	1784 (16)	492 (11)
Mixed: other: unknown	3960 (12)	1243 (12)	1188 (10)	410 (9)
Age, y				
0.5–4	11 756 (36)	3383 (32)	4026 (35)	1394 (32)
5–9	8985 (27)	3300 (32)	3162 (28)	1337 (31)
10–14	8576 (26)	2785 (27)	3133 (27)	1207 (28)
15–18	3373 (10)	1009 (10)	1150 (10)	416 (10)
Asthma severity				
Intermittent	—	5367 (51)	—	2158 (50)
Mild, persistent	—	2731 (26)	—	1226 (28)
Moderate, persistent	—	1639 (16)	—	896 (21)
Severe, persistent	—	135 (1)	—	74 (2)
Missing	—	595 (6)	—	—

— indicates not applicable.

**TABLE 2** Risk Factors for Asthma Prevalence and Severity Among Medicaid-Insured Children Matched to Their Claims

	Unadjusted Odds Ratio (95% Confidence Interval)	Adjusted Odds Ratio (95% Confidence Interval)
Asthma (yes vs no)		
Family history of asthma	4.94 (4.49–5.44)	4.08 (3.65–4.56)
Environmental tobacco smoke	1.54 (1.42–1.68)	1.17 (1.02–1.35)
Mother's tobacco smoke	1.36 (1.22–1.52)	1.04 (0.87–1.24)
Cockroaches	2.14 (1.88–2.44)	1.28 (1.08–1.52)
Rodents	2.16 (1.84–2.53)	1.14 (0.93–1.41)
Dust	2.63 (2.39–2.89)	2.21 (1.98–2.48)
Gas stoves	1.38 (1.27–1.50)	1.05 (0.95–1.16)
Pets	1.21 (1.11–1.31)	0.96 (0.86–1.06)
Male gender	1.27 (1.17–1.37)	1.21 (1.10–1.34)
Hispanic ethnicity	1.50 (1.38–1.62)	1.34 (1.21–1.48)
Age < 10 y	1.05 (0.97–1.14)	1.13 (1.02–1.25)
Persistent asthma vs intermittent		
Family history of asthma	1.47 (1.24–1.73)	1.26 (1.04–1.53)
Environmental tobacco smoke	1.01 (0.89–1.14)	0.85 (0.70–1.03)
Mother's tobacco smoke	1.06 (0.90–1.25)	1.05 (0.82–1.34)
Cockroaches	1.40 (1.18–1.67)	1.22 (0.97–1.53)
Rodents	1.51 (1.22–1.86)	1.36 (1.04–1.78)
Dust	1.23 (1.08–1.41)	1.30 (1.12–1.51)
Gas stoves	1.18 (1.04–1.34)	1.11 (0.97–1.29)
Pets	0.91 (0.80–1.03)	0.83 (0.71–0.96)
Male gender	1.09 (0.97–1.23)	1.09 (0.95–1.25)
Hispanic ethnicity	1.17 (1.03–1.32)	1.17 (1.01–1.36)
Age < 10 y	1.33 (1.17–1.50)	1.32 (1.14–1.53)

to be Hispanic and male compared with children without asthma (Table 2). In the multivariate analysis that controlled for family history of asthma, gender, ethnicity, age, environmental and maternal exposure to tobacco smoke, rodents, pets, gas stoves, cockroaches, and dust, all variables still were significantly associated with asthma, with the exception of pets, rodents, gas stoves, and maternal tobacco smoke exposure. Ages younger than 10 years were also significant in the multivariate model (Table 2).

Hispanic children, children younger than 10 years, children with a family history of asthma, and children who reported exposure to rodents and dust were more likely to have persistent asthma; gender was not associated with greater disease severity (Table 2).

### Prescription Drug Use

Inhaled-corticosteroid use by children with persistent disease doubled after enrollment in the Easy Breathing pro-

gram (0.64 vs 1.23 prescriptions per child with asthma per year, unadjusted) (Table 3). Proportionately, children with persistent asthma filled more inhaled-corticosteroid prescriptions relative to bronchodilator prescriptions after enrollment in the Easy Breathing program, and there was a decrease in the bronchodilator-to–

inhaled-corticosteroid ratio from 2.34 to 1.62. The number of prescriptions for oral steroids and for leukotriene modifiers also increased after enrollment in the Easy Breathing program (Table 3). Children with persistent disease were twice as likely to receive oral steroids compared with children with intermittent disease. Mast-cell-stabilizer use was low at the study start and remained low throughout the study (data not shown).

After enrollment in the Easy Breathing program, 96% of the children with persistent asthma were prescribed an anti-inflammatory drug, of which 93% were inhaled corticosteroids. Filled prescriptions for inhaled corticosteroids for children before enrollment in the Easy Breathing program did not change over 5 years (0.72 filled prescriptions per child with asthma in 2002 vs 0.54 per child with asthma in 2007). After enrollment, 94% of the children with asthma received a written asthma-treatment plan compared with less than 5% before the study began.

### Health Care Services Utilization

Between 2002 and 2007, the hospitalization rate for Medicaid-insured children with asthma in these 6 communities averaged 691 per 10 000, and

**TABLE 3** Relative Rates of Prescription Drugs and Medical Services Utilization for Children With Asthma Before and After Enrollment in the Easy Breathing Program

	Intermittent Asthma, RR (95% Confidence Interval)	Persistent Asthma, RR (95% Confidence Interval)
Drug category		
Bronchodilator	1.62 (1.47–1.79)	1.41 (1.31–1.51)
Inhaled corticosteroids	2.18 (1.74–2.74)	2.14 (1.94–2.36)
Leukotriene modifier	1.64 (1.18–2.27)	1.93 (1.58–2.36)
Oral corticosteroid	1.35 (1.15–1.59)	1.22 (1.09–1.38)
Medical service		
Emergency department	0.91 (0.82–1.02)	0.76 (0.68–0.84)
Emergency department 493	1.16 (0.91–1.48)	0.77 (0.66–0.90)
Hospitalization	0.91 (0.65–1.27)	0.56 (0.46–0.69)
Hospitalization 493	0.59 (0.36–0.98)	0.51 (0.39–0.65)
Outpatient visits	1.06 (0.98–1.14)	1.00 (0.93–1.07)
Outpatient visits 493	0.93 (0.82–1.06)	0.99 (0.90–1.10)

Relative rates (RRs) were adjusted for age, ethnicity, gender, calendar year, season, and asthma severity.

the rate for emergency-department visits averaged 3296 per 10 000 children (Connecticut Department of Public Health, written communication, 2009). Children subsequently enrolled in the Easy Breathing program over this same period had an average hospitalization rate of 563 per 10 000 and an emergency-department visit rate of 2310 per 10 000 before their enrollment. Thus, the medical services utilization of Easy Breathing enrollees was similar to the overall utilization of the Medicaid-insured population in these communities.

As found in the initial study of Easy Breathing,<sup>14</sup> as well as in other studies,<sup>20</sup> rates of hospitalization for children with asthma indicated marked seasonal patterns (data not shown). Hospitalization rates for children with intermittent disease were lower than the rates for children with persistent disease. In the multivariate analysis that controlled for age, ethnicity, gender, season, calendar year, and asthma severity, the asthma-related hospitalization rate decreased by 40% for children with intermittent asthma and by 49% for children with persistent asthma after enrollment in the Easy Breathing program. Asthma-related emergency-department visits decreased by 23% for children with persistent asthma (from 0.35 to 0.26 per child with asthma per year, unadjusted). There was no change in asthma-related emergency-department visits for children with intermittent asthma and no change in the average number of outpatient visits, which was low both before and after program implementation (3.20 compared with 2.83 visits per child with asthma per year, unadjusted) (Table 3). The hospitalization rate for children with asthma who were never enrolled in the Easy Breathing program remained high over the 5-year period in the 6 communities.

## DISCUSSION

The Easy Breathing program was successfully translated into a community setting with significant and sustained decreases in asthma-related hospitalizations and emergency-department visits. The program was effective in reducing hospitalizations and emergency-department visits in Medicaid-enrolled children in both urban-based and private practices and was used by a large number of practitioners in the community who enrolled significant numbers of children. Before implementing Easy Breathing, none of the practices had experience with a disease-management program, although all of them were discussing quality-improvement activities.

Various reasons have been suggested for the low adoption rates of guideline-based disease-management programs by primary care clinicians, including lack of knowledge, disagreement, and inertia.<sup>21–25</sup> In contrast, the Easy Breathing program has been readily adopted and used by the pediatric community in Connecticut. The simplicity of the program is the major reason cited for adoption by pediatricians. Easy Breathing is not a comprehensive, all-inclusive asthma-management program. In fact, in 2002, the program consisted of only 4 of 40 proposed elements in the 1997 guidelines,<sup>1</sup> namely, to make a diagnosis, to determine severity, to prescribe appropriate therapy, and to give patients a written asthma-treatment plan. Easy Breathing condensed the guidelines to a small number of “essential” elements and facilitated their use by the primary care clinician. Over time, clinicians began asking for additional materials such as educational materials and access to allergy testing and spirometry.

Despite its simplicity, however, no practice has enrolled all of its patients in Easy Breathing, and program pene-

tration within each of the communities has been variable. Barriers include time, reimbursement, and other practice priorities such as staff and clinician turnover, school physicals, and flu outbreaks, which have diverted their efforts. Most practices have targeted children known to have asthma and screen other children for asthma as time permits. Enrollment, however, remains ongoing, and results within practices have been acknowledged both at the individual patient level and at the practice level (eg, decrease in nebulizer treatments per year). In 2 communities, a major barrier has been a desire to implement their own asthma-management program and a concern about referral of patients for subspecialty care. In communities with high program penetration, however, referrals to subspecialists continue to outstrip the subspecialty community capacity to care for these children. Pediatricians have also expressed concern about administering the survey to all of their patients, although 38% of the children with asthma were newly diagnosed as a result of using the survey.

There are several limitations to our study and its generalizability. Claims data were available only for Medicaid-insured children; thus, the effectiveness of the program in reducing medical services utilization for privately insured children is not known. We previously demonstrated that the Easy Breathing program was effective in reducing urgent care outpatient visits and emergency-department visits for asthma for privately insured children.<sup>15</sup> Asthma Center staff provided continuous oversight to maintain program fidelity, and treatment plans were reviewed continuously to ensure adherence to severity-specific treatment guidelines as recommended by the National Asthma Education and Prevention Program. How much over-

sight is needed to maintain fidelity is not known. The program is funded by the state of Connecticut and has been shut down twice because of budget delays. Each time funding was restored, it was more difficult to reengage the pediatric community. Despite these interruptions, more than 85% of the practices continue to use the Easy Breathing program after 5 years. Finally, both the number of filled prescriptions and the number of outpatient visits for children with asthma were low. We do not know how many children received sample medications, and we do not know about the use of these medications; however, even this low number was sufficient to reduce the number of hospitalizations and emergency-department visits.

Our previous study results indicated that Easy Breathing was associated

with reduced costs of care.<sup>16</sup> A cost analysis of the current program is underway. The reduction in asthma hospitalizations in particular and the modest reduction in emergency-department visits demonstrated in this study would be expected to substantially reduce the costs of care, but this reduction could be balanced by the increased costs associated with increased inhaled-corticosteroid use and program-related costs.

## CONCLUSIONS

A disease-management program for children with asthma was successfully translated into a community setting and resulted in significant reductions in the number of hospitalizations and emergency-department visits for a large number of ethnically diverse children insured by Medicaid.

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**PRESIDENTIAL PAY:** *Each semester I get a bill for my eldest son's college tuition and fees. Every semester the total cost rose. When I have asked on occasion why the fees are so much higher, the typical response is that health care costs have escalated. Maybe I should check to see if the salary for the President of the University rose. As reported on NewYorkTimes.com (November 15, 2010:1–3), some presidents of private colleges are pulling down hefty paychecks. In 2008, 30 presidents of private colleges made more than a million dollars a year compared to 23 in 2007. The Chronicle of Higher Education reviewed the tax filings of 448 private colleges with yearly expenditures of more than \$50,000,000. While 78% of presidents made less than \$600,000 and half less than \$400,000, the total compensation for some is staggering. Four presidents made more than \$2,000,000. Sometimes the total compensation is due to an unusual circumstance such as cashing out a life insurance policy. The reputation of a university does not necessarily correlate well with presidential pay. The salary of only one Ivy League president was in the top 10 for total compensation, and the president of another makes less than the president of a small college in the Pacific Northwest. While presidents of colleges and universities manage quite complex institutions and recruitment of a new president can be difficult, many feel ill at ease at the widening separation between the salary of the president and the faculty. Moreover, the high cost of college for some families has led some to advocate cutting back on executive pay. As for my son, he is in a public school so that report has yet to be published, and a review of public documents suggests that the president of my son's university is on the low end of the pay scale. Maybe those rising fees really are due to mounting health care costs.*

Noted by WVR, MD