

ASTHMA CARE IN COMMUNITY HEALTH CENTERS: A STUDY BY THE SOUTHEAST REGIONAL CLINICIANS' NETWORK

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Federally funded community health centers (CHCs) were surveyed to assess their ability to serve low-income asthma patients in the southeastern United States. Data were collected on CHC clinicians, pharmacy services, and patient characteristics. Twenty-six (74%) of 35 participating CHCs provided data on 83 distinct clinic sites in eight states, representing 898,977 billable patient visits to 318,920 people during the one-year study period. Participating CHCs provided 23% of all CHC patient visits in Region IV in 1995. Sixty-two percent of patients had a family income below poverty level. Almost 75% of the patients were uninsured or receiving Medicaid. Asthma was the diagnosis code for 2.04% of all medical encounters. Twenty-nine percent of sites were unable to provide medications for uninsured asthma patients, while 66% could provide drug samples. Thirty-three percent of CHCs had in-house pharmacies and 33% offered pharmacy vouchers. Eighty-two percent could provide beta-agonist inhalers, 54% could provide steroid inhalers, and 17% could provide peak flow meters. Federally funded CHCs provide care to many asthma patients from the highest risk segments of the population, but often do not have the resources needed to follow current clinical guidelines. (*J Natl Med Assoc.* 1999;91:398-403.)

Key words: asthma ♦ community health centers
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Asthma is a treatable condition that still causes significant morbidity and mortality in the United States. Fourteen to 15 million people in the United States

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have asthma, a number that reflects a surprising increase in prevalence.^{1,2} Despite major advances in asthma treatment and pathophysiology, hospitalizations and deaths from asthma have risen significantly since the late 1970s in the United States and throughout the world.^{3,4} The rising impact of asthma also contributes significantly to health-care costs in the United States, with annual costs estimated at \$6.2 billion in 1990 (\$1.6 billion in direct medical costs).⁵ Minority and low-income populations have suffered disproportionately from increases in the prevalence of asthma, as well as suffering rates of hospitalization and mortality three times higher than those of the general population.⁶⁻⁹

Lack of access to comprehensive primary health care may contribute to the increased morbidity and mortality experienced by low-income and minority asthmatics.¹⁰ Low-income patients, whether uninsured or covered by Medicaid, historically have received

care that is more episodic and more likely to be received in hospital emergency rooms or hospital-based clinics.¹¹ Such episodic care for exacerbations of asthma increases hospitalizations and costs.¹²

Another factor contributing to increased asthma morbidity and mortality has been the gap between traditional practice patterns of primary care physicians and current guidelines for the management of asthma. Specific areas of concern include the overuse of acute bronchodilators such as theophylline and beta-agonists, and the underuse of preventive and anti-inflammatory medications such as steroid inhalers.¹³ Physicians also have been shown to underuse peak flow meters both for clinical monitoring and for patient self-management.¹⁴

Federally funded community health centers (CHCs) provide comprehensive primary care services to more than eight million medically underserved patients in the United States. According to the US Public Health Service (PHS), CHCs provide more than 18.5 million medical encounters (billable outpatient and inpatient visits) each year, mostly to low-income and minority clients. The Southeast Regional Clinicians' Network is comprised of physicians and clinicians from CHCs in the eight southeastern states of Region IV. In our first multicenter, multi-state practice-based research project, we attempted to answer the following questions:

- To what extent do Region IV CHCs serve the populations (minority, low-income, Medicaid, and uninsured) most likely to experience poor asthma outcomes?
- How many and what proportion of CHC visits have asthma listed as the primary or secondary diagnosis?
- What types of clinicians are providing asthma care in CHCs?
- What resources are available to CHC clinicians to provide steroid inhalers, spacers, peak flow meters, and other medications to their low-income or uninsured patients?

MATERIALS AND METHODS

All federally funded community and migrant health centers in US-PHS Region IV were invited to participate in the study. The centers chosen for participation demonstrated the ability or willingness to provide the data requested by the research team. A total of 35 centers signed up to participate in this study, representing approximately one-fourth of the

142 federally funded migrant or community health centers in the southeastern United States.

Two surveys were mailed to each community health center medical director and management information systems director. The one-page medical director survey collected data on clinician factors and the available resources to care for low-income and uninsured asthma patients. The management information systems survey requested detailed demographic and insurance data on patients with asthma. Additional information on patient utilization and demographics were collected from the Bureau of Primary Health Care's Bureau of Health Care Delivery and Assistance (BHCDA)-Net data system.

Results from the management information systems surveys and BHCDA-Net data were compiled using descriptive statistics to determine the volume of health services delivered to low-income asthma patients, the prevalence of asthma in CHC patient populations, and the insurance and income status of asthma patients. The medical director surveys assessed the ability of the CHCs to care for low-income asthma populations, the availability of pharmacy services, and the number of patients with access to subsidized asthma medications.

RESULTS

Twenty-six (74%) of the 35 CHCs completed surveys, representing 83 clinic sites operated by the participating CHC organizations. These 26 CHCs were drawn from all eight states of Region IV and represent 18% of all the CHCs in the Southeast. Both rural and urban CHCs were represented and provided 898,977 billable patient visits (medical encounters) to 318,920 active patients (medical users) from July 1, 1995 through June 30 1996. BHCDA-Net data from the Health Resources and Services Administration Region IV field office showed that all CHCs in Region IV provided 3.89 million medical encounters to 1.68 million individual patients (medical users) during their 1995 fiscal year. Nationally, CHCs provided 18.5 million visits to approximately 7.4 million individual patients in the same reporting period. Therefore, CHCs in this study provided 23% of all patient visits in Region IV and nearly 5% of all CHC patient visits in the nation during the 1995 reporting period.

Twenty-nine percent of registered patients in the participating CHCs were children ages 0-12 (n=92,330) and an additional 11.6% (n=36,872) were adolescents ages 13-19. Only 9% (n = 28,817) were

Table 1. Poverty and Insurance Status of Community Health Center (CHC) Patients

	26 Participating CHCs	All Region IV CHCs (Southeastern US)	All US CHCs
No. active patients (medical users)	340,710	1,677,080	7,376,877
No. projected asthma patients (assuming asthma =3.66% of users)	12,470	61,381	269,994
No. billable patient visits (medical encounters) per year	898,977	3,889,906	18,531,745
No. projected asthma visits per year (assuming asthma = 2.04% of visits)	18,500	83,721	378,048
No. (%) below poverty level*	210,311 (62)	931,603 (66)	3,268,487 (63)
No. (%) below 2× poverty level*	260,057 (76)	1,212,084 (86)	4,367,028 (84)
No. (%) uninsured†	155,165 (46)	609,276 (44)	1,950,606 (39)
No. (%) receiving Medicaid‡	99,019 (29)	485,956 (35)	2,023,640 (40)
% African American‡	51	47	29
% Hispanic‡	14	9	28

*Calculated as the proportion (%) of CHC users for whom poverty status was reported (poverty status reported on 1.41 million of 1.68 million total users in Region IV and 5.19 million of 7.38 million total users nationally).

†Calculated as the proportion (%) of CHC users for whom insurance status was reported (insurance status reported on 1.4 million of 1.68 million total users in Region IV and 5.06 million of 7.38 million total users nationally).

‡Calculated as the proportion (%) of CHC users for whom ethnicity was reported (ethnicity reported on 1.51 million of 1.68 million total users in Region IV and 5.57 million of 7.38 million total users nationally).

≥65 years. Forty-seven percent of CHC patients in the southeastern United States in 1995 were African American and 9% were Hispanic.

Sixty-two percent of the patients had family incomes below 100% poverty level, a poverty rate similar to that of all CHCs in the southeastern region (66% below poverty level) and throughout the United States (63% below poverty level). Seventy-five percent of patients in participating CHCs were uninsured (46%) or receiving Medicaid (29%) compared with 79% of patients in all Region IV CHCs who were uninsured (44%) or receiving Medicaid (35%) and 79% for all US CHCs (39% uninsured and 40% Medicaid). Table 1 compares regional and national CHC patients by income and insurance status.

Participating CHCs provided 18,500 asthma visits from July 1, 1995 through June 30, 1996. Asthma was the primary or secondary diagnosis in 2.04% (95% confidence interval [CI], 2.0-2.1%) of all billable medical encounters. Many CHCs were unable to generate prevalence data for individual patients (users) by diagnosis code, but data provided by seven CHCs showed that patients with asthma represented 3.66% of all their active medical patients.

Twenty-nine percent of the 83 CHC sites reported that they had no mechanism in place to provide

medications for uninsured asthma patients. Drug samples (66%) were the most common resource that clinic sites used to treat low-income asthma patients. Community health centers that were able to provide some subsidized medication reported in-house pharmacy (33%) and pharmacy vouchers (33%) as the most common mechanisms. Fifty-seven percent of the CHCs set limits on prescriptions for uninsured and low-income asthma patients.

Medical directors also were asked, "What medications do you provide for uninsured and low-income asthma patients at your clinic sites?" Eighty-two percent reported beta-agonist inhalers (95% CI, 73.7%-90.3%), but only 54% reported steroid inhalers (95% CI, 43.3%-64.7%). Almost three-quarters of clinic sites reported having oral medications available, including theophylline, prednisone, and beta-agonists. Only 35% of CHC sites (95% CI, 24.7%-45.3%) provided spacers for inhalers, and only 17% of sites (95% CI, 8.9%-25.1%) provided peak flow meters to their asthma patients (Figure 1).

There were 214.3 full-time equivalent clinicians available to care for asthma patients at the 83 clinic sites. Medical directors reported general internists as being likely to care for asthma patients at 66% of clinic sites, pediatricians at 61%, family physicians at

49%, family nurse practitioners at 34%, and physician assistants at 18%. No centers reported having allergy and immunology or pulmonary specialists on staff.

DISCUSSION

Because CHC participation in our study was not random, the survey data may not be representative of all CHCs in Region IV or of CHCs in other regions. However, survey data represent rural and urban sites in all eight states of Region IV, and participating sites provided 23.1% of all ambulatory medical encounters provided by Region IV CHCs in 1996.

Patients with asthma who receive care in federally funded CHCs are at high risk for adverse clinical outcomes. Sixty-six percent of Region IV CHC patients are poor, 75% are uninsured or receive Medicaid, and 57% are ethnic minorities (mostly African American or Hispanic). Low-income and minority patients experience substantially increased morbidity and mortality compared with asthma patients in the general population.^{15,16} Both Medicaid and uninsured patients are significantly more likely to be hospitalized and to present to the emergency room during acute exacerbations.¹⁷ If the case-mix in our participating CHCs is representative of CHC patient populations nationally, then CHCs may provide as many as 378,048 visits per year to 269,994 of the highest risk asthma patients in the nation.

Only 7 of the 26 CHC organizations were able to provide a detailed utilization profile of their asthma patients, suggesting that CHCs may not have sufficient management information systems capabilities for effective disease-state management. In addition, our survey only captured patients and visits in which asthma was the primary or secondary diagnosis code. Other prevalence studies have documented significant rates of undiagnosed asthma (episodic wheezing, etc). As a result, our estimates of patient visits and asthma prevalence may represent the minimum prevalence of asthma in the CHC patient population.

Current national guidelines for the treatment of asthma emphasize early use of anti-inflammatory medication, especially steroid inhalers.¹⁸ A study of prescription patterns in Philadelphia showed a worsening gap between recommended guidelines and actual practice from 1991 to 1993.¹⁹ Prescription rates for inhaled steroids declined at the same time that rates for oral bronchodilators (beta-agonists and theophylline) were increasing. A recent meta-analy-

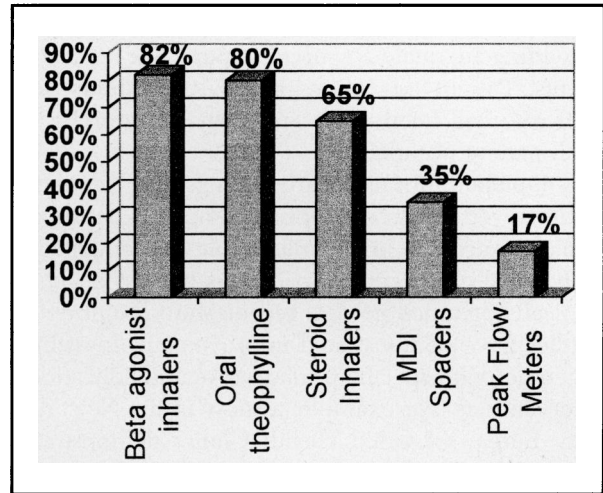


Figure 1. Proportion of CHC clinic sites with specific resources available for asthma care (% of 83 clinics).

sis of 24 studies involving the use of prophylactic inhaled steroids in childhood asthma demonstrated a 50% improvement in mean total symptom score for children in the steroid-inhaler group.²⁰ Underuse of inhaled steroid also has been associated with higher asthma hospitalization rates.^{21,22} Overuse of beta-agonist medication has been associated not only with increased symptoms and morbidity, but also with actual increases in asthma mortality.²³

Uninsured patients in our study population had better access to beta-agonist medication than steroid inhalers. Twenty-nine percent of CHC clinic sites reported having no mechanism available for providing low-cost asthma medications to the uninsured. Nearly half (46%) of participating CHC clinic sites provided no steroid inhalers to their patients. Of the sites that provided medication to patients, 82% provided beta-agonist inhalers.

National asthma care guidelines also promote teaching asthma self-management and prevention to patients, which includes teaching patients to use peak flow meters for self-monitoring. The vast majority (83%) of CHC clinic sites provided no peak flow meters to their asthma patients, and 65% provided no simple spacers to maximize the benefit of metered-dose inhalers. In contrast, the Ambulatory Sentinel Practice Network found that 72.2% of their participating practice sites had peak flow meters available, although there was no current or past peak flow measurement documented in 55.1% of encounters.¹² Increasing the use of peak flow meters

therefore will require educating clinicians as well as providing adequate resources to purchase the instruments. Patient education materials, methods, and staff also will need to be culturally appropriate for each patient population.

Outpatient primary care settings that serve the underserved are an appropriate venue for improving clinical outcomes in asthma. While implementation of hospital-based clinical pathways had no effect on clinical outcomes in one recent study,²⁴ numerous studies have demonstrated improvements in asthma outcomes with specific primary care and educational interventions. For example, a study in the New York City Bureau of Child Health Clinics demonstrated that educational interventions can be effective in changing behaviors both of patients (ie, returning for scheduled follow-up visits) and of their clinicians (ie, a ten-fold increase in the use of inhaled anti-inflammatory drugs).²⁵ Kaliner²⁶ provides an excellent summary of how clinicians can teach patient self-management based on daily peak flow-meter results. One study showed that educational efforts targeting children with a previous asthma hospitalization could save \$11.22 in health-care costs for every dollar spent on education.²⁷ Such interventions assume that physicians have the resources available to provide patient education, self-monitoring tools such as peak flowmeters, and anti-inflammatory medications such as steroid inhalers.

Community health center patients also may have adverse outcomes for reasons not addressed in this study. Patients who have an episodic pattern of care, seeking care only during acute exacerbations and over-relying on emergency room care, have more symptoms, more severe exacerbations, and higher costs related to their asthma.^{28,29} A study at Cook County Hospital showed that although minority patients expressed a high level of satisfaction with their primary care providers, they received suboptimal care with significant variations in physicians' adherence to asthma treatment guidelines. These variations correlated with the patients' ethnicity.³⁰ A study of discharge planning for children hospitalized for asthma found marked differences in the quality of care planned after hospital discharge for black and Hispanic patients (less preventive and follow-up care planned) compared with white patients.³¹

CONCLUSION

Many CHCs lack the resources needed for optimal care of asthma patients, particularly those who

are uninsured. Most current federal interventions to improve asthma outcomes have focused on educating clinicians and patients to comply with current treatment guidelines. Our data suggest that education is necessary but not sufficient. A second key element is that low-income and uninsured asthma patients have affordable access to recommended treatment modalities (ie, inhaled steroids and metered dose inhaler spacing devices) as well as to tools such as peak flow meters that are needed for self-monitoring and self-management. Because CHCs are the source of comprehensive primary care for many low-income, minority, and geographically underserved populations, investing in these tools could improve asthma care and outcomes for as many as a quarter of a million of the highest risk asthma patients in the United States.

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