

The Transfer of Uninsured Patients From Academic to Community Primary Care Settings

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While academic health centers (AHCs) represent only about 6% of the nation's hospitals, they provide almost 40% of charity care.¹ Approximately 26% of Medicaid discharges are from AHCs,¹ and the volume of uninsured patients at AHCs is expanding.² Although some uninsured patients are referred to AHCs for tertiary care, many seek primary care services at AHCs located in the inner city. This can lead to overcrowded emergency departments (EDs) and some resource-intensive hospitalizations that could be avoided with adequate access to primary care.

As AHCs struggle to manage the care of large numbers of uninsured patients, options include expanding primary care services, decompressing EDs, and avoiding unnecessary hospitalizations. Several AHCs have demonstrated that expansion of primary care coverage can reduce ED use.³ When primary care access is enhanced under Medicaid managed care, unnecessary ED visits are reduced by one-third.⁴ However, increases in primary care coverage can be difficult for AHCs because the physician workforce at many AHCs deemphasizes primary care. This deficit in the academic medical workforce was temporarily altered in the 1990s, when managed care forced many AHCs to expand their primary care capacity.⁵ However, more recent trends have resulted in a reduction in primary care,⁶ further exacerbating the capacity of AHCs to effectively manage uninsured patients.

Many urban AHCs are bordered by neighborhoods that include community primary care physicians (PCPs). Therefore, an alternative to enhance primary care capacity is for AHCs to use community-based primary care through contractual arrangements. Herein, we describe a program implemented and the data patterns of patient assignment during a 3-year transition from AHC to community-based settings. The data represent the healthcare use patterns of patients who were transferred from AHC primary care practices to community-based practices during this interval.

The Virginia Commonwealth University Medical Center (VCUMC) is the only comprehensive AHC in central Virginia. It comprises a licensed hospital containing 779 beds, outpatient clinics, and a 600-physician practice. The VCUMC is the region's only level I trauma center and offers more than 200 specialty areas, including organ transplantation, spinal cord trauma, burn, and cancer treatment. It has more than 30,000 inpatient admissions per year, more than

Objectives: To use the administrative capacity of a health maintenance organization to enroll uninsured patients at an academic health center into a coordinated care program in which patients were assigned to community primary care physicians over 3 years.

Study Design: Observational case study of a cohort of 2389 patients enrolled for at least 1 year and cross-sectional observations for all enrollees.

Methods: Among 18,336 eligible patients enrolled in the program between January 1, 2001, and December 31, 2003, a total of 2389 patients were continuously enrolled before and after the inauguration of the program.

Results: Over the 3-year study, most of the eligible uninsured patients were successfully enrolled in community-based practices. For the cohort studied, reductions were observed in the proportions of enrollees with inpatient hospitalizations (17.6% vs 13.8%) and with emergency department visits (73.9% vs 42.9%) ($P < .001$ for both). Although the rates of emergency department visits and hospitalizations were not reduced for the before-and-after cohort, utilization rates per 1000 enrollees declined for the overall program.

Conclusions: Contractual arrangements with community physicians were used to augment primary care capacity for uninsured patients. Although per-member hospitalizations and use of the emergency department did not improve for the cohort studied, declines were observed for the program overall when examined by study year. Using community primary care physicians to coordinate care for the uninsured seems to reduce emergency department use and hospitalizations.

(*Am J Manag Care.* 2009;15(4):245-252)

In this issue

Take-Away Points / p251

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Full text and PDF

**For author information and disclosures,
see end of text.**

500,000 annual outpatient visits, and approximately 80,000 ED visits annually. The VCUMC also owns and operates a Medicaid health maintenance organization (HMO), Virginia Premier Health Plan, which began operations in August 1995. This HMO was originally a joint venture with a public for-profit company. Eventually, the HMO was purchased by the VCUMC. The HMO operates in more than 80 counties in central, eastern, western, and southwestern Virginia and has a total enrollment of approximately 130,000 Medicaid beneficiaries. The HMO uses IDX (IDX System Technology, Inc, Torrance, CA) systems for billing and claims processing, referrals, and enrollment tracking.

About 15% of the population of central Virginia is without health insurance, about the same as statewide figures.⁷ Approximately one-half of uninsured individuals statewide live in households below 200% of the federal poverty level, and the Virginia Medicaid program covers only specific populations within this income level (ie, pregnant women, children, and adults who are aged, blind, or disabled). Adults with income levels above 24% of the federal poverty level are ineligible for Medicaid. The VCUMC provides healthcare for a disproportionate number of uninsured individuals in Virginia compared with other hospitals and medical centers. The VCUMC is responsible for approximately 30% of total inpatient admissions for indigent patients in Virginia.

The Indigent Care Program in the Commonwealth of Virginia provides assistance to patients who are US citizens and whose household incomes are below 200% of the federal poverty level. All individuals must also meet a financial means asset test. Approximately 30,000 individual patients who qualified for the Indigent Care Program were seen in a VCUMC outpatient setting in 2000. Within this population, approximately 6200 indigent care patients were hospitalized during the same year.

In November 2000, using the managed care infrastructure from its Medicaid HMO, the VCUMC established the Virginia Coordinated Care (VCC) program to deliver healthcare to eligible uninsured individuals. The VCC program was designed as a care coordination program for patients who qualified for the state's Indigent Care Program, lived in the Greater Richmond area (≤ 50 -mile radius of the VCUMC), and had no other coverage options (ie, Medicaid, Medicare, or another sponsoring health plan). This population initially represented about 30% of the uninsured indigent population seeking care at the VCUMC. The VCC was designed to improve access to primary care for uninsured patients who frequently sought care through the ED. The strategy was to use managed care principles to contain the costs of caring for this population. The program has been previously described in a study⁸ of metropolitan

programs that used managed care principles for the care of uninsured patients.

In addition to a monthly management fee, community PCPs were paid fee-for-service rates comparable to approximately 110% of the Medicaid fee schedule in Virginia. The \$5 per member per month was comparable to the management fee paid by the AHC's Medicaid HMO.

In all, there were 50 PCPs at 32 different community practice sites. Among the community providers, there were 26 family medicine physicians at 16 community practices, 5 pediatricians at 5 community practices, 2 family medicine physicians at 2 free clinics, 12 family medicine physicians and 2 pediatric physicians at 8 federally qualified health centers, and 3 internists at a community-based practice affiliated with the AHC. Since the beginning of the program in 2000, few providers have discontinued their participation with the VCC program. All of the community-based providers in the VCC also participated in Virginia's Medicaid programs. About one-half of the community providers received graduate or postgraduate degrees from the AHC. Approximately 60% of the community providers have been in practice for more than 15 years. The VCUMC physicians remained the predominant source of specialty care during the study.

The VCC members shared the cost of services based on a sliding fee scale. Enrollees with family income below 100% of the federal poverty level had no cost-sharing responsibilities. More than two-thirds of the VCC members fell into this category. For patients between 101% and 200% of the federal poverty level, cost sharing was based on a sliding scale that ranged from 5% to 70% patient responsibility.^{3,4} In addition to the sliding scale payment, patients were responsible for paying \$4 per prescription for a 1-month supply. In addition to the systematic assignment of uninsured patients to community-based PCPs, the VCC included a care coordination component. The concept for care coordination services was developed through a private foundation grant in 1998. The model was developed to coordinate services across the AHC's healthcare delivery system for its uninsured population and included interventions by outreach workers and by nurse coordinators. The outreach workers were individuals with experience in working with the uninsured population in community-based organizations or in outpatient clinic settings. Outreach workers were located in the AHC's ED and identified patients who were eligible for participation in the VCC, educated them regarding primary care options, scheduled appointments for needed services, provided information regarding community social resources, and arranged for transportation as needed. These outreach workers also facilitated communication between community providers and VCUMC specialists to ensure that patients were linked with appropriate

resources and received optimal services. Nurse care coordinators responded to healthcare questions, reinforced treatment plans, and assisted VCC members to navigate through the VCUMC.

Data for the study were from several sources. The VCUMC information systems created monthly patient demographic and utilization data files. These data included information about inpatient discharges and outpatient encounters, including ED visits and prescription drug use. Virtually all inpatient, ED, and outpatient laboratory and radiology services were also provided at the VCUMC. All prescription medications to this population were available only through the VCUMC outpatient pharmacy. Claims for community-based primary care were generated by using the IDX systems processing capabilities of the VCUMC's Medicaid HMO. A monthly data transfer from the VCUMC's Medicaid HMO provided claims data for community-based services, patient demographics, and a member enrollment file. The latter file was used to generate data on per-member-per-month utilization and costs. The common unique identifier across these various files was the patient's medical record number. The study was approved by the VCUMC's Committee on Human Subjects.

METHODS

The time frame chosen for this analysis was from January 1, 2001, through December 31, 2003. The analysis focused on patients 18 years or older at enrollment who had a community PCP assignment for at least 1 month during the study. The various data files were combined and summarized using SAS (version 9.1; SAS Institute, Cary, NC). Patient demographic characteristics were determined at the time of initial enrollment. Months of enrollment were summarized at the patient level by PCP type. Healthcare utilization records of patients were aggregated by service type (eg, ED visit or primary care visit). Two different analyses were performed.

First, to study the effects of the program on patients with prior experience at the AHC, a cohort of 2389 enrollees who received care at the VCUMC before and after the implementation of the VCC program was identified. This cohort included men and women with age at enrollment ranging from 18 years to younger than 64 years who had sought care at the VCUMC before enrolling in the program and who were subsequently continuously enrolled with the VCC for at least 1 year. Before-and-after comparison of service utilization for the cohort was performed. Only enrollees transferred to community PCPs were evaluated in the before-and-after design. Before-and-after comparison of service use was conducted. The null hypothesis of equal proportions was evaluated at the 5% level of significance for these analyses.

Second, a separate descriptive analysis was performed for all enrollees in each study year. Approximately one-half of the population is new to the program each year. Therefore, many of these enrollees had no prior experience with the AHC or with PCPs.

Microsoft (Redmond, WA) Access 2000 and Excel 2000 were used to calculate the percentages of enrollees with claims and per-member-per-month use for inpatient discharges, ED visits, primary care visits, and specialty care visits. Although most enrollees were transferred to community practice PCPs during the study, some patients stayed with VCUMC practices longer than others, mostly based on physician advocacy. Therefore, the program was not randomized, and the study was nonexperimental in design. Demographic and enrollment characteristics, as well as binary measures of service use, were determined using patient-level data.

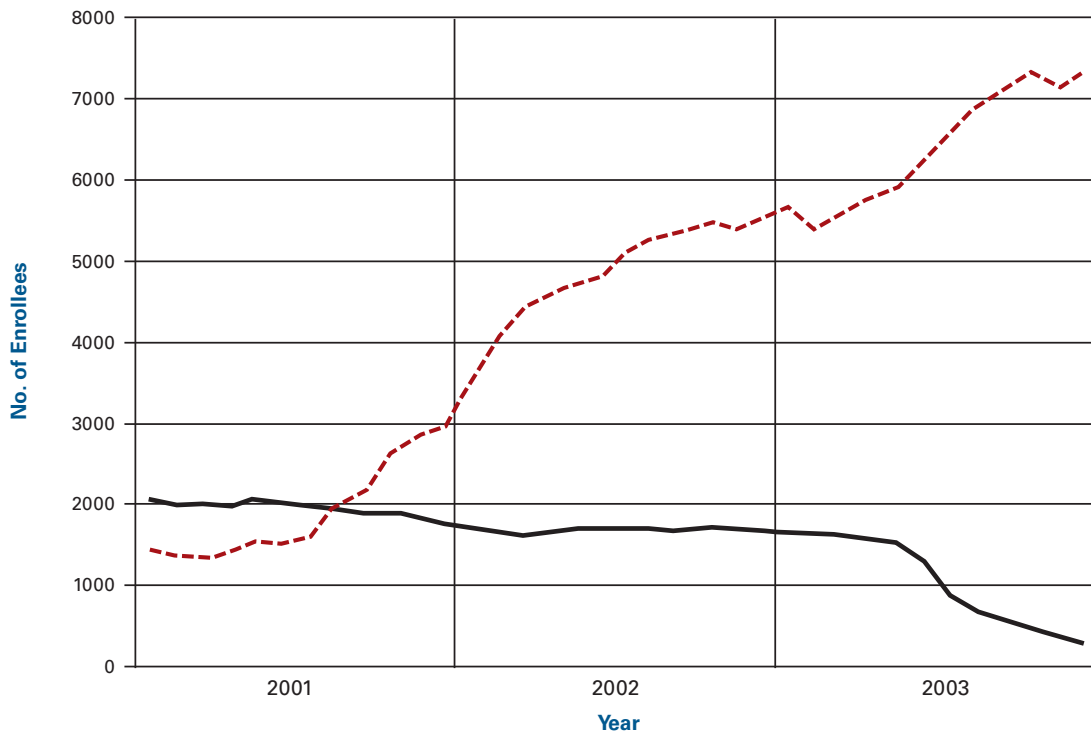
RESULTS

Between January 1, 2001, and December 31, 2003, a total of 18,336 unique individuals enrolled in the program for at least 1 month. Some disenrolled from the program during the study because they became eligible for Medicaid, acquired employer-based coverage, or had other reasons to leave the program at least temporarily. Therefore, the analysis was restricted to those individuals who were enrolled for at least 75% of the study. There were 11,834 individuals who met this eligibility requirement. Of these, 9383 patients were assigned to a community physician practice during the study. As patients were enrolled and assigned to community practices, the number of patients with a community PCP steadily increased during the study (Figure). Eventually, most patients had their primary care transferred to community PCPs. The initial results represent the subset of patients who were continually paneled with a community PCP practice for at least 1 year and had used clinical services at the AHC before enrollment. We also present results from the overall enrollment on a cross-sectional basis for each study year.

Table 1 gives the characteristics of 2389 continuously enrolled participants. As shown, among 2389 patients, 71% were black, 24% were white, and the rest were of other races/ethnicities. Sixty-two percent of all cohort members were female, and 38% were male. Seventy-six percent reported residence in the City of Richmond. Among 1489 patients with identified sex, 98.8% were female, and 1.2% were male. Seventy-six percent of all cohort members reported residence in the City of Richmond.

Table 2 gives proportionate utilization data with administrative claims from the cohort studied. There were statistically significant reductions in the proportions of enrollees with any

■ **Figure.** Monthly Enrollment Levels in Community (Dashed Line) and Academic (Solid Line) Practice Settings Over the 3-Year Study (January 1, 2001, to December 31, 2003)



inpatient hospitalization (17.6% vs 13.8%) and with any ED visit (73.9% vs 42.9%) ($P < .001$ for both). Conversely, there were increases in the numbers of enrollees with any primary care visit (23.3% vs 33.0%) and with any specialty care visit (72.4% vs 79.3%) ($P < .001$ for both).

Table 3 summarizes per-member-per-month utilization data. Enrollees in the program had significant increases in per-member-per-month primary care, but per-member-per-month specialty care visits and rates of inpatient hospitalizations remained similar between the 2 periods. Although there was a trend for decreases in ED visits, this reduction was not statistically significant.

Table 4 gives cross-sectional data by year for the entire program, including members of the before-and-after cohort and patients who were enrolled as the program grew during the 3-year study. Therefore, these samples were substantially larger than the continuously enrolled cohort. The data show that the first 2 years of the program represented a steady state with respect to inpatient hospitalizations. In the third year of the initiative, there was an 8.3% decline in inpatient admissions. There was a steady decrease in the rate of ED visits per 1000 enrollees over the 3 years studied.

The costs for the program over the first 3 years escalated as patients were transitioned from the AHC to the care of community PCPs (data not shown). In the first full year of

operations, payments were \$320,128 to community PCPs. Thereafter, payments rose to \$551,878 in the second year and to \$1,323,808 in the third year. In 2007, payments and management fees to PCPs in the community amounted to \$2,485,238. The monthly costs of primary care were approximately \$5 per member per month in 2003 and grew to approximately \$7 per member per month in 2007. These costs exclude the administrative overhead of processing claims and care coordination for the program.

DISCUSSION

With a disproportionately large responsibility for delivering care to the uninsured, as well as the potential for avoidable resource-intensive utilization, some AHCs may seek to expand primary care capacity. Although many AHCs made substantial investments in expanding primary care capacity in the 1990s, the emerging dominance of inpatient capacity concerns and reversal of consumer popularity for gatekeeping models of care led ultimately to a reduced emphasis on primary care.⁶ With this diminished primary care capability, it has been difficult to implement effective coordinated care for patient populations such as the inner-city uninsured. Therefore, the AHC described herein contracted with community-based practices to supplement its primary care needs for managing

Transfer of Uninsured Patients From Academic to Community Settings

this population. The program used the administrative infrastructure from a Medicaid HMO owned by the AHC to utilize managed care principles for the care of an uninsured inner-city population.

In a series of 5 case studies conducted by the National Association of Public Hospitals and Health Systems⁸ in 2005, including the program described herein, there were several notable common attributes that were shared among the programs that sought to use managed care principles for uninsured populations. First, all of the programs were careful to avoid insurance product structures to circumvent unnecessary state insurance regulation. Therefore, none of the programs, including the VCC, had a defined benefit package. Second, all of the programs sought to more effectively manage their uninsured populations by establishing a medical home and by controlling avoidable costs (eg, unnecessary ED visits, specialty care, and hospitalizations). Third, each of the programs used inpatient care management and coordinated discharge planning to ensure a seamless post-acute care process further aimed at averting unnecessary resource utilization. There were other programmatic attributes among the 5 case studies such as co-payment strategies, but these were not consistently applied.

The findings from this study indicate that expanding the primary care capacity of an AHC for the care of an uninsured inner-city population resulted in a decrease in the proportion of enrollees who used the ED and in a reduction in hospitalizations. The results demonstrate no significant reductions in utilization rates in hospitalizations or ED visits for a continuously enrolled before-and-after cohort. Nonetheless, evaluation of patterns of care for all enrollees by study year revealed declining rates of use per 1000 enrollees for ED visits and for inpatient hospitalizations. Because the turnover for the population is approximately 50% each year, it is unclear whether this decrease in utilization is more reflective of use patterns for those who remained in the program or for those who disenrolled. Further research will be needed to evaluate the dynamics of how enrollment influences utilization and outcomes.

■ **Table 1.** Characteristics of a Continuously Enrolled Cohort (N = 2389) of Patients in the Virginia Coordinated Care Program (January 1, 2001, to December 31, 2003)

Characteristic	No. (%)
Age group, y	
<18	18 (0.8)
18-34	1014 (42.4)
35-44	673 (28.2)
45-64	667 (27.9)
>64	17 (0.7)
Race/ethnicity	
White	563 (23.6)
Black	1695 (71.0)
Other	131 (5.5)
Sex	
Female	1471 (61.6)
Male	918 (38.4)
Residence	
Urban	1825 (76.4)
Duration in program, y	
<1	2330 (97.5)
≥1	59 (2.5)

Our program included care management through nurse coordinators who were based in the ED and identified patients eligible for the program and provided services. Other models may use community-based case managers who could be more effective at linking indigent patients to needed services versus in an ED setting. This approach would have the benefits of optimizing preventive strategies and of intervening much earlier for chronic illnesses. Although our model was efficient because of the large population base served by the AHC (ie, >1 million), targeted community-based efforts (eg, health fairs and other safety net providers) may also be

■ **Table 2.** Use of Inpatient, Emergency Department, and Primary and Specialty Care Among a Continuously Enrolled Cohort in the Virginia Coordinated Care Program (January 1, 2001, to December 31, 2003)

Variable	No. (%) ^a Before Enrollment (n = 4471)	After Enrollment (n = 4037)
Any inpatient discharge	420 (17.6)	330 (13.8)
Any emergency department visit	1765 (73.9)	1024 (42.9)
Any primary care visit	557 (23.3)	788 (33.0)
Any specialty care visit	1729 (72.4)	1895 (79.3)

^aP < .001 for all comparisons.

■ **Table 3.** Use of Inpatient, Emergency Department, and Primary and Specialty Care Among a Continuously Enrolled Cohort in the Virginia Coordinated Care Program (January 1, 2001, to December 31, 2003)

Variable	Before Enrollment		After Enrollment		P
	Total	PMPM/1000 Enrollees	Total	PMPM/1000 Enrollees	
Inpatient discharges	570	19.5	539	18.5	.9
Emergency department visits	3655	124.1	2977	101.6	.13
Primary care visits	1496	51.2	3860	130.8	<.001
Specialty care visits	3502	118.9	3712	126.7	.64

PMPM indicates per member per month.

■ **Table 4.** Emergency Department and Inpatient Utilization Data by Year for All Virginia Coordinated Care Program Enrollees (January 1, 2001, to December 31, 2003)

Variable	Year 1 (n = 14,024)	Year 2 (n = 14,655)	Year 3 (n = 16,362)
Total inpatient discharges	2494	2621	2774
Inpatient discharges/1000 enrollees	273	288	266
Total emergency department visits	8160	8099	8298
Emergency department visits/1000 enrollees	894	862	782

efficient. Nonetheless, while community-based care coordination models may have appeal, limited resources may compel AHCs to begin with models that target ED populations to provide immediate returns on their investments.

Because of the substantive burden of the uninsured that is concentrated at AHCs, some centers are restricting access. For instance, formal AHC policies limiting care to uninsured patients were reported by up to 13% of AHC faculty in a 2003 survey.⁹ Other AHCs have used community-based practices to support the care of underserved populations, with varying degrees of success. At the University of New Mexico, reduced hospitalizations were estimated to have saved the AHC substantial resources.¹⁰ The primary care capacity of the community practice sites from this program enabled the AHC to accommodate a large portion of its uninsured population from the inner-city region.

Virtually all of the community-based practices that participated in the program described in this study were also part of a Medicaid HMO provider network. Medicaid HMOs may be uniquely suited for expanding administrative services to uninsured populations, as beneficiaries often alternate between Medicaid eligibility and uninsured status. Unlike commercial HMOs, Medicaid health plans have continued to use many traditional methods of managed care, including primary care gatekeeping and utilization review.¹¹ A trend that has developed is the emergence of Medicaid-focused health plans, and more than one-half of these are provider sponsored. Some

AHCs have responded to this trend in Medicaid managed care by purchasing, developing, or coventuring in HMOs. The AHC described herein was able to take advantage of its provider-sponsored HMO to establish needed administrative functions for managing the primary care needs of a disadvantaged vulnerable population. Therefore, the existing infrastructure from a provider-sponsored HMO enabled the AHC to support functions such as member services, claims processing, and provider relations without significantly increasing administrative overhead for the program. In addition, the HMO's existing infrastructure enabled the program to access information systems to support needed services for enrollment and data analyses. Finally, the HMO staff provided expert advice in areas such as policy development, case management services, medical management, and performance improvement. The decision to develop this program based on managed care principles to accommodate the primary care needs of the uninsured in a community setting had many benefits for the AHC.

There were several lessons learned from the initiative. The positive response of community PCPs to the program was widespread; they exhibited a shared interest in the coordination of care for the population. Because the program contracted with physicians who were underrepresented in the inner city, an opportunity was provided to bridge town-and-gown relationships. However, community PCPs expressed concerns that payments would be inadequate, and they raised questions

regarding the fate of patients in the event that contracts ended. They also had a strong desire to maintain existing referral relationships with specialty colleagues, and this led to some conflict in management decisions, especially when access to AHC specialists was constrained by capacity. For the AHC, faculty leaders were worried about funding support that would be shifted to community providers. However, few faculty expressed apprehension over quality differences, and the referral relationships between community PCPs and medical center faculty were strengthened by the program. Most faculty acknowledge that the VCC has decompressed the medical campus and has enabled a primary care network that is more convenient for disadvantaged patients, many of whom had longstanding difficulties with obtaining transportation and with navigating the complexities of an urban medical center.

This observational study has several limitations. First, because the evaluation was conducted in a single AHC, this case study of enrollment and utilization characteristics of an uninsured population in a managed care model may not be generalizable to other settings. Similar studies need to be performed at other centers to confirm these results. However, our study involved a large sample size at an AHC located in an inner-city teaching hospital, and many AHCs are located in urban environments with high rates of uninsured individuals. Second, secular changes in utilization and patterns of care seeking could have influenced the results. Third, the study represents data collected over a 3-year period from January 1, 2001, to December 31, 2003, and recent economic flux may affect the generalizability of the data.

Nevertheless, the program remains strong. In 2008, there were more than 20,000 enrollees. However, because the AHC receives disproportionate share of hospital (ie, DSH) payments for indigent care, the costs of furnishing primary care in the community are funded through its operating margin, not through federal or state funding. The AHC realizes that the cost savings through reduced ED visits and hospitalizations may take several years to be realized, when more effective care management of chronic illnesses may lead to improved outcomes. Nevertheless, this model of contracting with community PCPs has had the added advantage of providing a new flexible capacity for primary care among the uninsured population. While further studies are planned to document the continuance of observed trends in reduced ED visits and inpatient admissions, the sustainability of the community PCP network may be the most lasting contribution for this AHC.

Take-Away Points

This article describes a program to coordinate the care of an inner-city uninsured population at an academic health center. Using the administrative capacity of a provider-sponsored health maintenance organization, the academic health center contracted with community primary care physicians to better manage uninsured patients. Key findings include the following:

- The expanded primary care capacity through the contractual arrangements allowed the academic health center to reduce emergency department overcrowding with uninsured patients.
- The improved access to primary care seemed to reduce emergency department visits and hospitalizations over a 3-year period.
- Community primary care physicians were enthusiastic about participation, and most remained with the program from its conception.

CONCLUSIONS

This study reported on an AHC that contracted with PCPs in community settings by using the administrative and networking capacity of a Medicaid HMO. The study sought to evaluate the benefits of a program that coordinated primary care access in the community and attempted to avert resource-intensive utilization using managed care principles. The results indicate that enrollees in the program had reduced rates of ED visits and lower rates of hospitalization. However, the declining rates for hospitalizations only came after 2 years in the program and in fact rose in the second year (Table 4). Further research is needed to determine if these findings are sustainable and are generalizable to other settings.

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Funding Source: Dr Anum was supported in part by grant no. P60 MD002256 from the National Institutes of Health.

Author Disclosure: Dr Retchin, Ms Garland, and Dr Anum are employees of the Virginia Commonwealth University (VCU), the sponsor of the program described in the article. Dr Retchin is the chief executive officer of the VCU Health System, and the program reports to him and directly benefits his performance evaluation in his current position.

Authorship Information: Concept and design (SMR, SLG); acquisition of data (EAA); analysis and interpretation of data (SMR, SLG, EAA); drafting of the manuscript (SMR, SLG); critical revision of the manuscript for important intellectual content (SMR, EAA); statistical analysis (EAA); provision of study materials or patients (SMR, SLG); administrative, technical, or logistic support (SMR, SLG); and supervision (SMR).

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