ORIGINAL ARTICLE

The University of North Carolina's Health Care Pharmacy Assistance Program

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BACKGROUND UNC Health Care has a Pharmacy Assistance Program (PAP) that provides financial assistance to uninsured patients in North Carolina who need prescription medications. Despite significant investment in the program, little is known about the patients accessing it or the specific health care services they use. Our objectives were to describe the PAP population, to examine their use of prescription medications and health services, and to characterize changes in prescription medication use and expenditures from 2009 through 2011.

METHODS We used a repeated cross-sectional study design, merging prescription claims with health records from Carolina Data Warehouse for Health, to measure use of prescription medications and use of inpatient, outpatient, and emergency department care by PAP participants. Prescription claims were grouped into therapeutic categories. We generated descriptive statistics for key variables to examine health service utilization from 2009 through 2011.

RESULTS From 2009 through 2011, PAP served 7,180 patients from 81 counties in North Carolina. PAP users received a mean of 23 prescriptions, at an average cost of $754 per recipient per year. An average of $2.93 million per year was spent on the program, with an 8% rise in spending from 2009 to 2011. Inpatient care and emergency department care were utilized by 30% and 31% of PAP users, respectively, and there was minimal change in these rates over 3 years.

LIMITATIONS Data were limited to medications dispensed through PAP and to health services provided by UNC Health Care.

CONCLUSION With the state's decision to not expand Medicaid, PAP will continue to be an important resource for North Carolina's low-income citizens.

In 2010 an estimated 52 million Americans had no health insurance for at least part of the year [1]. Uninsured or underinsured adults are economically vulnerable, and compared with those who have adequate health insurance, they are likely to have a greater number of chronic medical conditions, less access to appropriate care (including prescribed medications) to help them manage these conditions, and worse clinical outcomes [2-4]. Thus those who might benefit the most from prescribed medications are least able to afford them. The Patient Protection and Affordable Care Act of 2010 (ACA) has attempted to bridge these access barriers by offering affordable coverage options for uninsured individuals through the expansion of state Medicaid programs and the creation of state and federal health insurance marketplaces [5]. Although the ACA has decreased the number of uninsured individuals, many individuals remain uninsured, particularly in states that have chosen to not expand Medicaid.

In 2010–2011, more than 1.5 million North Carolinians aged 64 years or younger (18.9% of the nonelderly population) were uninsured [6]. Although expansion of the North Carolina Medicaid program through the ACA would have provided insurance coverage to 42% of uninsured adults aged 18–64 years [6, 7], North Carolina decided to opt out of the Medicaid expansion. Thus the state will have to continue to rely on a patchwork of programs to provide health care services to uninsured patients, who are often socioeconomically and medically vulnerable. Several existing programs are offered through free clinics, federally qualified health centers, and hospitals; these programs help provide uninsured or underinsured patients with access to medical treatments or medications.

Two such programs are offered to North Carolina residents through UNC Health Care: the UNC Health Care Charity Care Program and the UNC Health Care Pharmacy Assistance Program (PAP). The Charity Care Program subsidizes the cost of health care services such as inpatient hospitalizations and outpatient clinic visits for North Carolina residents with incomes at or below 250% of the federal poverty guidelines. PAP provides prescription benefit services to North Carolina residents with incomes at or below 200% of the federal poverty guidelines (regardless of employment status) who are uninsured and are ineligible for federal or state insurance programs such as Medicare Part D, Medicaid, or Veterans Affairs health benefits. Patients who meet the PAP eligibility criteria do not need to be legal residents of the United States, as long as they are residents of North Carolina. Those meeting enrollment criteria for PAP receive a renewable 1-year prescription benefit that provides 30-day supplies of any formulary medication for a copayment of $4. Patients enroll in the program by completing an

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application that is supported and verified by UNC Health Care through documentation of the patient's finances and residency status. Without the Charity Care Program and PAP, these low-income residents would likely be unable to obtain needed medical care and prescription assistance. However, UNC Health Care incurs substantial costs by providing uncompensated care through these programs.

A recent systematic review of the literature on pharmaceutical patient assistance programs [8] described a variety of programs available to patients who cannot afford medications. This review makes it clear that patient assistance programs differ with regard to strategies for medication acquisition, degree of reliance on pharmaceutical manufacturer discounts, and eligibility criteria.

To date, little is known about the patients enrolled in PAP or the specific health care services they use. The objectives of this study are to describe the population that received PAP services from 2009 through 2011, to examine their use of prescription and health care services, and to examine year-to-year changes both in prescription medication utilization by PAP recipients and in PAP expenditures across medication categories. Information about who uses PAP, what medications and health care services they use, and the associated costs of those medications and services is critically important when designing strategies for ensuring the sustainability of PAP, so that this program can continue to provide access to the pharmacological treatments needed by this vulnerable population.

Methods

Study Design

We identified all patients who received services from the UNC Health Care PAP from January 1, 2009, through December 31, 2011. We used a repeated cross-sectional design to examine yearly patterns of medication and health services use among PAP recipients. Patients receiving services in more than 1 year were included in the cross-sectional sample for each year during which they received services.

Data

We merged data from 3 sources to obtain information about PAP recipients from 2009 through 2011. First, prescription claims were obtained from the pharmacy benefits management company responsible for overseeing PAP. Second, we accessed the Carolina Data Warehouse for Health, which contains data from the clinical and operations systems throughout the UNC Health Care system, and we extracted information about the demographic characteristics of PAP recipients; we also extracted administrative data for all inpatient, emergency department, and outpatient services provided to PAP recipients through the UNC Health Care system. Finally, enrollment information for patients was abstracted to identify when they had PAP coverage. The information from each data source was merged into a composite analytical data set using unique identifiers and was then deidentified for research purposes. This study was approved by the Biomedical Institutional Review Board of the University of North Carolina at Chapel Hill.

Measures

Demographic characteristics. We collected information on the age, sex, race or ethnicity, county of residence, and language preference (English, Spanish, or other) of all PAP recipients from 2009 through 2011. Language preference was included because we thought that non-English speakers might have problems with enrollment and/or communication within the health care system, which could affect their medication adherence and health service use. We used the North Carolina Department of Commerce's county tier designations for 2013 to categorized each county's economic status; the 40 counties that are most economically distressed are categorized as Tier 1, the 40 next-most-distressed counties are categorized as Tier 2, and the 20 least distressed counties are categorized as Tier 3 [9].

Medication use and health service utilization. Prescription claims were used to calculate the annual number of prescription fills and total prescription expenditures per PAP recipient per year. To better understand which prescriptions drove PAP use from 2009 through 2011, we used the RED BOOK therapeutic classification system [10] to organize prescription claims by broad therapeutic categories. Prescription costs were based on the cost to UNC Health Care of acquiring each drug product as of the date the drug was dispensed. In addition, we examined PAP recipients' utilization of inpatient, emergency department, and outpatient care provided by UNC Health Care. Emergency department visits that resulted in a hospitalization were classified as inpatient care, not emergency care. Specific health service utilization measures calculated for this study included the proportion of PAP recipients accessing each of these services within the year, the number of times each service was used, and the length of stay per admission (for inpatient hospital stays).

Statistical Analysis

We used descriptive statistics to examine the PAP population's demographic characteristics, health service utilization, and prescription use. Counts and percentages were reported for categorical variables; means and standard deviations were reported for continuous variables. We also described overall prescription utilization for the 15 most commonly used therapeutic categories and prescription spending for the 15 therapeutic categories with the highest expenditures each year.

Results

Table 1 describes the populations that received PAP benefits in 2009, 2010, and 2011. Over these 3 years, PAP served a total of 7,180 unique patients. The number of people receiving at least 1 prescription through PAP declined from 4,248 in 2009 to 3,601 in 2010, and then it increased slightly to

TABLE 1.
Demographic Characteristics of Patients Enrolled[a] in the UNC Health Care Pharmacy Assistance Program (PAP), 2009–2011

Characteristic	2009 (N = 4,248)	2010 (N = 3,601)	2011 (N = 3,784)
New member[b], No. (%)	—	1,149 (32%)	1,579 (42%)
Age (in years), Mean±SD	45±14	46±13	46±13
Female sex, No. (%)	2,348 (55%)	1,971 (55%)	2,078 (55%)
Race, No. (%)			
White	2,154 (51%)	1,825 (51%)	1,906 (50%)
African American	1,291 (30%)	1,077 (30%)	1,096 (29%)
Other	803 (19%)	699 (19%)	782 (21%)
Preferred language, No. (%)			
English	3,210 (76%)	2,955 (82%)	3,185 (84%)
Spanish	459 (11%)	427 (12%)	521 (14%)
Other	579 (14%)	219 (6%)	78 (2%)
Economic status of county of residence[c], No. (%)			
Tier 1	299 (7%)	231 (6%)	259 (7%)
Tier 2	1,731 (41%)	1,471 (41%)	1,514 (40%)
Tier 3	2,165 (51%)	1,860 (53%)	1,989 (53%)
Unknown	53 (1%)	39 (1%)	22 (1%)
County of residence[d], No. (%)			
Orange (Tier 3)	695 (16%)	603 (17%)	666 (18%)
Alamance (Tier 2)	770 (18%)	678 (19%)	661 (17%)
Wake (Tier 3)	552 (13%)	493 (14%)	533 (14%)
Durham (Tier 3)	371 (9%)	311 (9%)	331 (9%)
Chatham (Tier 3)	222 (5%)	181 (5%)	192 (5%)
Other	1,638 (39%)	1,335 (37%)	1,401 (37%)

Note. UNC, University of North Carolina; SD, standard deviation.
[a]Includes patients who had at least 1 prescription filled during the calendar year. A total of 7,180 unique individuals received at least 1 prescription as a beneficiary of the PAP of UNC Health Care during the 3-year period 2009–2011.
[b]Not enrolled during the previous year.
[c]North Carolina Department of Commerce county tier designations for 2013 [9] were used to determine the economic status of the patient's county of residence. Tier 1 counties are the state's 40 most economically distressed counties; Tier 2 counties are the 40 next-most-distressed counties; and Tier 3 counties are the 20 least economically distressed counties.
[d]For all 3 years, the 5 counties with the greatest numbers of PAP users in residence were Orange, Alamance, Wake, Durham, and Chatham.

3,784 in 2011. Of the 3,601 patients receiving PAP benefits in 2010, almost one-third (n=1,149) had not received program benefits the preceding year; in 2011, 42% (n=1,579) of the 3,784 patients receiving PAP benefits had not received them the year before.

Demographic characteristics of the PAP population changed little over the 3 years of the study. In 2011 the majority of recipients were female (55%), white (50%), English-speaking (84%), and residents of Tier 3 (least economically distressed) counties (53%). The most common counties of residence for PAP participants in 2011 were Orange (18%), Alamance (17%), Wake (14%), Durham (9%), and Chatham (5%). Over the 3-year interval, patients enrolled in PAP included residents of 81 of North Carolina's 100 counties (results not shown).

PAP recipients received an average of about 23 prescription fills in 2011 (Table 2). The number of prescription fills per recipient was similar in 2009 and 2010, with beneficiaries receiving an average of 21.4 and 23.6 prescription fills, respectively. The mean number of unique pharmaceutical agents prescribed annually for each PAP recipient was 6.3 in 2009 and 6.6 in 2010 and 2011. The cost of prescription treatments received was $659 per recipient in 2009, $820 in 2010, and $784 in 2011, and the mean cost per recipient per year for the 3-year period was $754.

In 2011, 89% of PAP recipients used non–emergency department outpatient care provided by the UNC Health Care system, and the average number of visits per recipient (among those who had any outpatient visit) was 7.3. In 2011, 30% of PAP recipients used inpatient care, with an average of 1.8 inpatient admissions per recipient (among recipients with at least 1 hospitalization); the average length of stay for an inpatient admission among this population was 5.3 days. Episodic mood disorders, unspecified procedures (such as medication infusion requiring hospitalization), diabetes, and heart failure were among the most common reasons for receiving inpatient care (see Appendix 1; online version only). In 2011 emergency department care was used by 31% of PAP recipients, and the average number of visits per recipient (among recipients visiting the emergency

TABLE 2.
Prescription Use and Health Care Utilization of Patients Receiving Benefits From the UNC Health Care Pharmacy Assistance Program (PAP), 2009–2011

Variable	2009 (N = 4,248)	2010 (N = 3,601)	2011 (N = 3,784)
Prescription use by PAP recipients[a], Mean±SD			
No. of prescriptions filled per recipient	21.4±27.4	23.6±27.0	22.8±26.5
Total cost (in dollars) per recipient	659±1,501	820±2,060	784±2,054
No. of unique products prescribed per recipient	6.3±5.1	6.6±4.9	6.6±5.1
Health care utilization by PAP recipients[a]			
Outpatient care			
Recipients with any outpatient visit during the year, No. (%)	3,784 (89%)	3,186 (88%)	3,353 (89%)
No. of outpatient visits per recipient among recipients with at least 1 visit, Mean±SD	7.1±7.9	6.9±6.8	7.3±7.4
Inpatient care			
Recipients admitted to the hospital during the year, No. (%)	1,321 (31%)	1,063 (30%)	1,136 (30%)
No. of hospital admissions per recipient for recipients with at least 1 admission, Mean±SD	1.8±1.5	1.9±1.5	1.8±1.5
Length of stay (in days), Mean±SD	5.2±7.0	5.5±8.4	5.3±6.7
Emergency department care[b]			
Recipients who visited the emergency department during the year, No. (%)	1,316 (31%)	1,125 (31%)	1,168 (31%)
No. of visits per recipient for recipients with at least 1 emergency department visit, Mean±SD	2.2±2.6	2.1±2.3	2.1±2.4

Note. UNC, University of North Carolina; SD, standard deviation.
[a]Only those who had at least 1 prescription filled during the year were counted as PAP recipients.
[b]Emergency department visits resulting in admission to the hospital were counted as inpatient care, not as emergency care.

department at some point in the year) was 2.1. Emergency services were most commonly provided for the treatment of pain of varying origins and for symptoms of acute respiratory or gastrointestinal illness (see Appendix 2; online version only).

The use of specific therapeutic classes of medications varied little from year to year during the period 2009–2011 (Table 3). The total number of prescriptions dispensed by PAP dropped from 91,030 in 2009 to 84,846 in 2010, a decrease of 7%; this number then increased by 2%, for a total of 86,251 prescriptions in 2011. The top 15 therapeutic classes of medication dispensed by PAP accounted for about 67% of all prescription fills in 2011. The most common therapeutic classes used by PAP recipients in 2011 were antidepressants (7,330 fills), opioid analgesics (7,110 fills), anticonvulsants (5,678 fills), diuretics (4,226 fills), medications for gastroesophageal reflux disease (4,137 fills), and antihyperlipidemic agents (4,136 fills). Other commonly used medications included antihypertensive agents, such as angiotensin-converting enzyme (ACE) inhibitors (3,429 fills) and beta blockers (3,292 fills); antihyperglycemic agents were also commonly prescribed, including oral glucose-lowering agents (3,081 fills), insulin products (2,817 fills), and supplies for testing blood glucose levels (2,091 fills).

Although prescription medication use changed little from year to year, expenditures by PAP varied substantially (Table 4). Prescription expenditures increased 5% from 2009 to 2010 (from $2.80 million to $2.95 million), and they increased another 3% in 2011 (to $3.04 million). Over the 3-year period 2009–2011, the mean annual expenditure for PAP was $2.93 million. The highest amounts of spending in 2011 were for opioid analgesics ($399,271), hematopoietic agents ($324,232), anticoagulants ($285,168), antiviral agents ($186,542), and antipsychotic agents ($153,482). Total expenditures for the top 15 therapeutic classes of drugs combined represented 74% of all PAP prescription expenditures in 2011. Variation in expenditures across years was particularly prominent for anticoagulant and anticon-

APPENDIX 1.
Top 10 Primary Diagnoses During Inpatient Hospitalization for Patients Receiving Benefits From the UNC Health Care Pharmacy Assistance Program, 2009–2011

This appendix is available in its entirety in the online edition of the NCMJ.

APPENDIX 2.
Top 10 Primary Diagnoses During Emergency Department Visits for Patients Receiving Benefits From the UNC Health Care Pharmacy Assistance Program, 2009–2011

This appendix is available in its entirety in the online edition of the NCMJ.

TABLE 3.
Prescription (Rx) Utilization of Patients Receiving Benefits From the UNC Health Care Pharmacy Assistance Program, 2009–2011, by Therapeutic Classification of the Drug Prescribed

Therapeutic class	Example medication[a]	2009 Rx fills (rank[b])	2010 Rx fills (rank[b])	% change from 2009 to 2010	2011 Rx fills (rank[b])	% change from 2010 to 2011
Antidepressants	Citalopram	7,364 (1)	6,779 (1)	–8%	7,330 (1)	8%
Opioid analgesics	Oxycodone/acetaminophen	6,904 (2)	6,479 (2)	–6%	7,110 (2)	10%
Anticonvulsants	Gabapentin	5,558 (3)	5,406 (3)	–3%	5,678 (3)	5%
Diuretics	Hydrochlorothiazide	5,195 (4)	4,572 (4)	–12%	4,226 (4)	–8%
Acid reflux/GERD	Omeprazole	5,007 (5)	4,302 (5)	–14%	4,137 (5)	–4%
Antihyperlipidemic agents	Simvastatin	4,404 (6)	4,252 (6)	–3%	4,136 (6)	–3%
ACE inhibitors	Lisinopril	3,912 (7)	3,608 (7)	–8%	3,429 (7)	–5%
Beta blockers	Atenolol	3,898 (8)	3,466 (8)	–11%	3,292 (8)	–5%
Corticosteroids (oral/inhaled)	Prednisone	3,180 (10)	3,075 (10)	–3%	3,287 (9)	7%
Oral glucose-lowering agents	Metformin	3,596 (9)	3,223 (9)	–10%	3,081 (10)	–4%
Insulins	Insulin glargine	2,613 (13)	2,669 (12)	2%	2,817 (11)	6%
Benzodiazepines	Clonazepam	2,861 (11)	2,714 (11)	–5%	2,619 (12)	–4%
Antibiotics	Levofloxacin	2,740 (12)	2,395 (13)	–13%	2,481 (13)	4%
Calcium channel blockers	Amlodipine	2,213 (14)	2,020 (15)	–9%	2,113 (14)	5%
Glucose-testing supplies	Test strips	2,206 (15)	2,196 (14)	0%	2,091 (15)	–5%
Total Rx fills for top 15 therapeutic classes		**61,651**	**57,156**	**–7%**	**57,827**	**1%**
Total Rx fills for all drugs of any class		**91,030**	**84,846**	**–7%**	**86,251**	**2%**
Total Rx fills for top 15 therapeutic classes as a percentage of total Rx fills for all drugs		**68%**	**67%**	**—**	**67%**	**—**

Note. ACE, angiotensin-converting enzyme; GERD, gastroesophageal reflux disease; UNC, University of North Carolina.
[a]Example medication is the most commonly filled product in the study sample for that drug classification.
[b]Rank is determined based on total number of prescriptions filled.

vulsant medications, increasing for the former and decreasing for the latter. The largest growth in spending was for opioid analgesics ($168,418 in 2009; $208,804 in 2010; and $399,271 in 2011) and for hematopoietic agents ($86,768 in 2009; $180,404 in 2010; and $324,232 in 2011).

Discussion

PAP is an important source of prescription medications for more than 3,700 North Carolinians; in 2011 this program provided more than $3 million worth of prescription medications. This cost estimate is conservative, because it only accounts for the acquisition costs of these medications; it does not consider the overhead and pharmacy personnel costs related to administering the program and enrolling patients. However, these additional costs could not be attributed specifically to PAP, because the program exists in combination with traditional pharmacy services. Notably, the amount spent by PAP is growing; over the 3 years of this study, spending on prescription medications increased from $2.8 million to $3.0 million. From these observations, it is clear that PAP is a considerable expense for the UNC Health Care system.

There are a number of interesting trends regarding the population served by PAP. The number of patients using PAP services declined from 2009 to 2010 and then grew slightly in 2011; this period coincided with a significant economic recession, which may have contributed to financial difficulties and greater need for prescription assistance among economically vulnerable patients. It is also interesting to note that, although the majority of PAP recipients resided in Orange County and the surrounding counties, the program was accessed by residents of 81 of North Carolina's 100 counties. Indeed, many patients resided a considerable distance from UNC Health Care in Orange County. This finding exposes a need for strategies to improve the accessibility of PAP services for those living further from the UNC Health Care system. For example, PAP currently limits prescription refills to a 30-day supply, but allowing 90-day refills for medications used to treat chronic conditions could reduce geography-related access barriers.

Despite variation in the number of PAP recipients enrolled in the program during the observation period, we noted an increase in prescription expenditures per recipient, from $659 in 2009 to $784 in 2011. This increase is likely due to several factors. With the release of generic products to the market, several manufacturers have discontinued the provision of brand-name medications through bulk replacement programs, which provide free drugs in bulk quantities to providers serving needy patients. For the past several years, manufacturer bulk replacement programs provided a total of 75 medications to PAP beneficiaries. Discontinuation of some of these programs resulted in the inability to replace 10 high-cost, high-utilization medications, so PAP began providing these medications at cost, thereby increasing prescription expenditures. Another factor that likely contributed to the increase in PAP expenditures is the introduction of additional high-cost medications (such as oral oncolytics) to the PAP formulary. It is anticipated that prescription

TABLE 4.
Acquisition Cost of Prescriptions Utilized by Patients in the UNC Health Care Pharmacy Assistance Program, 2009–2011, by Therapeutic Classification of the Drug Prescribed

Therapeutic class	Example medication[a]	2009 total cost in dollars (rank[b])	2010 total cost in dollars (rank[b])	% change from 2009 to 2010	2011 total cost in dollars (rank[b])	% change from 2010 to 2011
Opioid analgesics	Oxycodone/acetaminophen	168,418 (4)	208,804 (3)	24%	399,271 (1)	91%
Hematopoietic agents	Pegfilgrastim	86,768 (12)	180,404 (5)	108%	324,232 (2)	80%
Anticoagulants	Warfarin	204,198 (2)	252,051 (1)	23%	285,168 (3)	13%
Antivirals	Valacyclovir	123,373 (9)	252,000 (2)	104%	186,542 (4)	–26%
Antipsychotic agents	Quetiapine	180,980 (3)	176,681 (6)	–2%	153,482 (5)	–13%
Partial opioid agonists	Buprenorphine/naloxone	98,949 (11)	195,227 (4)	97%	128,317 (6)	–34%
Anticonvulsants	Gabapentin	231,057 (1)	124,840 (9)	–46%	119,123 (7)	–5%
Corticosteroids (oral/inhaled)	Prednisone	116,304 (10)	103,420 (11)	–11%	114,206 (8)	10%
Antidepressants	Citalopram	148,746 (5)	139,882 (8)	–6%	109,599 (9)	–22%
Antihyperlipidemic agents	Simvastatin	130,663 (8)	106,650 (10)	–18%	83,717 (10)	–22%
Glucose-testing supplies	Test strips	74,281 (13)	74,905 (12)	1%	76,534 (11)	2%
Antiplatelet agents	Clopidogrel	65,193 (17)	74,417 (13)	14%	70,351 (12)	–5%
Antibiotics	Levofloxacin	72,286 (14)	71,685 (14)	–1%	69,787 (13)	–3%
Digestive enzymes	Lipase/protease/amylase	69,853 (16)	58,625 (16)	–16%	66,260 (14)	13%
Immunosuppressants	Mycophenolate	71,405 (15)	44,629 (20)	–37%	65,279 (15)	46%
Total acquisition cost for all 15 therapeutic classes combined		**1,842,474**	**2,064,220**	**12%**	**2,251,866**	**9%**
Total acquisition cost for all drugs of any class		**2,801,058**	**2,953,924**	**5%**	**3,035,773**	**3%**
Total acquisition cost for 15 therapeutic classes as a percentage of the total cost of all drugs			**66%**	**70%**	**—**	**74% —**

Note. UNC, University of North Carolina.
[a]Example medication is the most commonly filled product in the study sample for that drug classification.
[b]Rank is determined based on total acquisition cost. The 15 classes of drugs listed are those that had the greatest acquisition cost in 2011.

expenses per recipient will continue to rise as new life-saving therapies are approved for use and the availability of manufacturer assistance programs simultaneously decreases.

From 2009 through 2011, there was little change in the therapeutic classes that were most commonly prescribed for PAP participants. The greatest need for assistance appears to have been for antidepressants and opioid analgesic medications, which highlights the importance of mental health and pain management needs in the PAP population. Although there was little change in which classes of medications were most commonly dispensed to patients, there was considerable variation in the ranking of therapeutic classes by total acquisition cost. This can be explained in part by changes in the availability of medications included on the PAP formulary. For example, in 2011 opioids became the highest-ranking therapeutic class based on acquisition cost, despite having been ranked 4th in 2009. This may have resulted from a significant increase in the use of more expensive, long-acting preparations of opioid agents, such as controlled-release oxycodone (OxyContin, Purdue Pharma) and fentanyl. Similarly, the significant increase in spending on hematopoietic agents—from $86,768 in 2009 to $324,332 in 2011—is explained by growth in the use of pegfilgrastim (Neulasta, Amgen). An opposite trend was that anticonvulsants decreased in cost ranking, as a result of the release of several generic alternatives (eg, lamotrigine, divalproex sodium, levetiracetam, and topiramate).

The results of this study show that there was significant growth both in the use of PAP services and in PAP expenditures. The need for PAP services is likely to continue, given North Carolina's decision to opt out of Medicaid expansion and the state's high rate of unemployment. Therefore, innovative strategies must be developed and implemented to ensure the sustainability of PAP. One such strategy, adopted in 2011 by the UNC Health Care Department of Pharmacy, was the implementation of the Carolina Assessment of Medications Program (CAMP). This program focuses both on formulary management and on comprehensive medication therapy management for PAP recipients. Comprehensive medication therapy management has been shown to improve clinical outcomes while also resulting in institutional cost savings [11], and since its inception, CAMP has been implementing formulary management strategies in an effort to reduce pharmacy expenditures. These strategies have included increasing pharmaceutical manufacturers' provision of brand name medications, switching PAP recipients to lower-cost generic medications when appropriate, and implementing a prior-authorization process for therapies that are expensive and/or less well validated. Currently, there are 11 medications that require authorization prior to dispensing; this number represents only about 2% of available formulary medications. Programs such as CAMP provide opportunities to improve PAP's quality of care and efficiency moving forward.

Limitations

The results of this study should be interpreted in light of several limitations. First, this study used a descriptive cross-sectional design; to evaluate the effect of PAP on health outcomes, a more rigorous study design would be needed. Also, we only had information about prescriptions filled by PAP, not about any additional medications that PAP users may have obtained from outside pharmacies. Similarly, because all of the study's health services data were extracted from the Carolina Data Warehouse for Health, no information was captured about any health care services that PAP participants may have received outside of the UNC Health Care system. Finally, caution should be used when comparing the UNC Health Care PAP to other pharmacy assistance programs, given the likely differences in the populations covered and the services provided.

Conclusion

There continues to be high demand for the prescription services offered by the UNC Health Care PAP. Given the decision by the state of North Carolina to not expand Medicaid under the ACA, PAP will continue to serve as an important resource for uninsured patients who might otherwise be unable to afford prescription medications. Therefore, strategies to ensure the sustainability of PAP and other pharmacy assistance programs must be considered and implemented. NCMJ

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