

Patient Self-Management Program for Diabetes: First-Year Clinical, Humanistic, and Economic Outcomes

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ABSTRACT

Objective: To assess the outcomes for the first year following the initiation of a multisite community pharmacy care services (PCS) program for patients with diabetes.

Design: Quasi-experimental, pre-post cohort study.

Setting: 80 community pharmacy providers with diabetes certificate program training who were reimbursed for PCS by employers in Greensboro, N.C., Wilson, N.C., Dublin, Ga., Manitowoc County, Wis., and Columbus, Ohio.

Patients: 256 patients with diabetes covered by self-insured employers' health plans.

Interventions: Community pharmacist patient care services using scheduled consultations, clinical goal setting, monitoring, and collaborative drug therapy management with physicians and referrals to diabetes educators.

Main Outcome Measures: Changes in glycosylated hemoglobin (A1C), low-density lipoprotein cholesterol (LDL-C), blood pressure, influenza vaccinations, foot examinations, eye examinations, patient goals for nutrition, exercise, and weight, patient satisfaction, and changes medical and medication utilization and costs.

Results: Over the initial year of the program, participants' mean A1C decreased from 7.9% at initial visit to 7.1%, mean LDL-C decreased from 113.4 mg/dL to 104.5 mg/dL, and mean systolic blood pressure decreased from 136.2 mm Hg to 131.4 mm Hg. During this time, influenza vaccination rate increased from 52% to 77%, the eye examination rate increased from 46% to 82%, and the foot examination rate increased from 38% to 80%. Patient satisfaction with overall diabetes care improved from 57% of responses in the highest range at baseline to 87% at this level after 6 months, and 95.7% of patients reported being very satisfied or satisfied with the diabetes care provided by their pharmacists. Total mean health care costs per patient were \$918 lower than projections for the initial year of enrollment.

Conclusion: Patients who participated in the program had significant improvement in clinical indicators of diabetes management, higher rates of self-management goal setting and achievement, and increased satisfaction with diabetes care, and employers experienced a decline in mean projected total direct medical costs.

Keywords: Patient Self-Management Program, pharmaceutical care, diabetes, disease management, chronic care, quality of life, health care costs, health outcomes

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An essential ingredient that has been missing from the health care delivery system in the United States is the active involvement of the patient who is key to achieving therapeutic goals in ambulatory care. Research by the American Pharmacists Association (APhA) Foundation¹ and the Asheville Project²⁻⁴ has shown that when patients are engaged and understand their role, they become much more active and are capable of achieving significant improvements in adherence and other health outcomes.

The Asheville Project^{5,6} has been providing pharmaceutical care services for employees of the City of Asheville for 8 years and employees of that city's Mission Hospitals for 6 years. These services are provided by a network of pharmacists in the surrounding area who have completed accredited diabetes certification programs and who coach patients on how to self-manage their diabetes. Success in this ongoing program is defined as improvement in glycosylated hemoglobin (A1C) concentrations, increased patient satisfaction with pharmacy services, and decreased costs of medical care for patients with diabetes. Copayments for diabetes medications and related supplies are waived as an incentive for patients to participate.

Because of the success of the Asheville Project and other collaborative care programs involving pharmacists, interest has increased in devel-

oping a model that can be replicated and scaled up in diverse community and payer settings and that would have the capacity to transform the health care system, improve outcomes, and control costs. Implementing change in the system is a challenge that the APhA Foundation addressed with support of a grant from Aventis Pharmaceuticals beginning in 2002. The design includes new components that focus on aligned incentives, collaborative care, and a Patient Self-Management Program for Diabetes (PSMP Diabetes) credentialing process.

Objectives

The PSMP Diabetes pilot project was designed to establish a new health care delivery program at five pilot sites with approximately 50–100 patients enrolled at each site for a minimum of 1 year. The project objectives were:

- To implement and evaluate the first year of operation of a collaborative health management program coordinated by community pharmacists, in conjunction with other health care providers, that will improve adherence with diabetes self-management strategies and keep patients with diabetes healthy and productive on the job, which, in turn, will lower employers' overall health care costs
- To develop a patient self-management training and assessment program, successful completion of which will equip patients with the knowledge and skills needed to actively participate in managing their diabetes
- To encourage businesses (employers) to provide appropriate financial incentives to (a) patients (employees) to encourage their participation in the program, and (b) providers (pharmacists, physicians, certified diabetes educators, and other health care professionals) to encourage active patient participation and interaction, including treatment, education, and monitoring

Methods

The PSMP Diabetes was offered as a voluntary benefit at the employer organization sites listed in Table 1. The pilot program was offered in community independent pharmacies, community chain pharmacies, and ambulatory care clinics and at onsite locations designated by several of the employers. Characteristics of these sites and pharmacists included:

- Private or semiprivate areas for patient consultation
- Technician support freeing pharmacists for patient care activities
- Internet access for recording and tracking interventions
- Experience with patient-focused disease management programs
- Demonstrated communication skills
- Ability to implement point-of-care testing technologies
- Use of nationally recognized treatment guidelines (e.g., those of the American Association of Clinical Endocrinologists and American Diabetes Association)

The model was designed to allow sufficient flexibility to accommodate the different practice settings represented in the pro-

AT A GLANCE

Synopsis: In five geographically distinct communities, pharmacist care provided to 256 patients with diabetes produced better clinical results and lower overall costs during the first year of the APhA Foundation's Patient Self-Management Program for Diabetes. Patients were more satisfied with their overall diabetes care as well as the care delivered by 80 community pharmacy providers.

Analysis: *These results demonstrate that the findings of the Asheville Project can be reproduced in a wide variety of settings with diverse workforces. Employers in the five communities reimbursed community pharmacists for scheduled consultations, clinical goal setting, monitoring, collaborative drug therapy management with physicians, and referrals to diabetes educators. Not only did clinical, economic, and humanistic improvements reach statistical significance, the results were positive from the employers' perspectives, as health care's inflationary spiral was contained. Also, better clinical care and greater satisfaction with self-management of a chronic disease such as diabetes means happier employees and dependents, and this translates into a workforce that approaches each day's work more positively. Finally, this study provided for employers an important lesson in health care economics—one of relevance to Medicare Part D and its medication therapy management services—in that costs increased for medications and medication therapy services yet decreased overall, as the need for medical care declined.*

Table 1. Study Sites and Participants

Employer and Pilot Site	Pharmacist Network (no. providers)	No. Pharmacy Providers	No. Evaluable Patients
Mohawk, Dublin, Ga.	Coordinated by GPhA	12	51
VF Corporation, 4 sites in Greensboro, N.C., and Wilson, N.C.	Piedmont Pharmaceutical Care Network	21	48
Ohio State University, Columbus, Ohio	OSU Managed Care with Kroger	12	81
Kroger, Columbus, Ohio	Kroger Pharmacists	18	24
Lakeshore Business Coalition (6 employers), Manitowoc, Wis.	Pharmacists Society of Wisconsin, organizing entity for Manitowoc County Pharmacists	17	52
Total		80	256

Abbreviations used: GPhA, Georgia Pharmacy Association; OSU, Ohio State University.

ject, the specific demographics of the patient population served, and those practice arrangements being made within local and/or regional health care market places.

Intervention

The practice model was designed to bring about a high level of collaboration in care by increasing communications among patients, pharmacists, physicians, and other members of the health care team. Enhanced communication promotes sharing of pertinent clinical data, including the objective measures obtained in the pharmacy, and the facilitation of evaluation of patient progress toward clinical goals and adjustments in the patient's treatment plans.

Community pharmacists in the program had completed an accredited diabetes certificate training program and/or had achieved the diabetes credential of the National Institute for Standards in Pharmacist Credentialing. In addition, participating pharmacists received training on use of PSMP process of care and documentation tools.

Patients who enrolled in the program were offered waived copayments for diabetes-related medications and supplies or other incentives determined by the individual employers. Patients worked with pharmacists through a structured series of visits that focused on knowledge, skills, and performance. As patients reached certain milestones in self-management of their condition, they were recognized with the PSMP Diabetes Credential. Pharmacists were reimbursed for patient counseling services according to payment schedules negotiated with the employer by the local pharmacy network at each site. Patients were referred to diabetes education centers for additional education when indicated and to their physician for changes in therapy or resolution of medication therapy problems identified by the pharmacists. The Patient Support and Care Process Flow chart (Figure 1) illustrates the collaborative care process and interventions that define this practice model.

Process of Care

Each participating employer site worked with a local pharmacy provider network to enroll patients with diabetes. The enrollment

period and project duration were established at each site to allow pharmacists to monitor each patient for 12 months.

The employers notified all employees at the sites of the availability of the program, and beneficiaries with diabetes voluntarily enrolled in the program. Employees were invited to orientation programs at each site to learn about the program and complete necessary enrollment forms. All patients were required to give written consent once they were informed of the pertinent background information on the project, what their participation involved (including potential benefits, risks, inconveniences, discomforts), their right to confidentiality, and their right to withdraw at any time.

After completing an employer enrollment form and signing the informed consent to participate and an authorization for medical information to be sent to the pharmacist by other health care providers, the patient was enrolled by the employer and assigned a patient code. Patients indicated their first and second choices from a list of pharmacist care locations. The pharmacist network coordinator then assigned patients to pharmacists. The records were transferred to the pharmacists, who contacted the patients to set up their initial appointment.

Initially, each participating patient completed a patient history form that provided general health information used by the pharmacist to fully assess the patient's status. After meeting with the patient, the pharmacist sent an informational letter to the patient's physician on the behalf of the employer and patient. Included with this letter was the consent to share medical information and a request for current laboratory results and the physician goals for the patient.

Laboratory tests were performed periodically at physician offices and pharmacy locations throughout the project. Results and subsequent intervention activities were logged on a PSMP trifold Credential Status Card that provided the basis for ongoing monitoring and communication between and among patients and health care providers. The data were also entered by providers into the APhA Foundation's PSMP Diabetes Web site module. Additional forms were also used for provider team communication, patient communication and education, and service quality and satisfaction assessment.

Over the course of the project, participating pharmacists main-

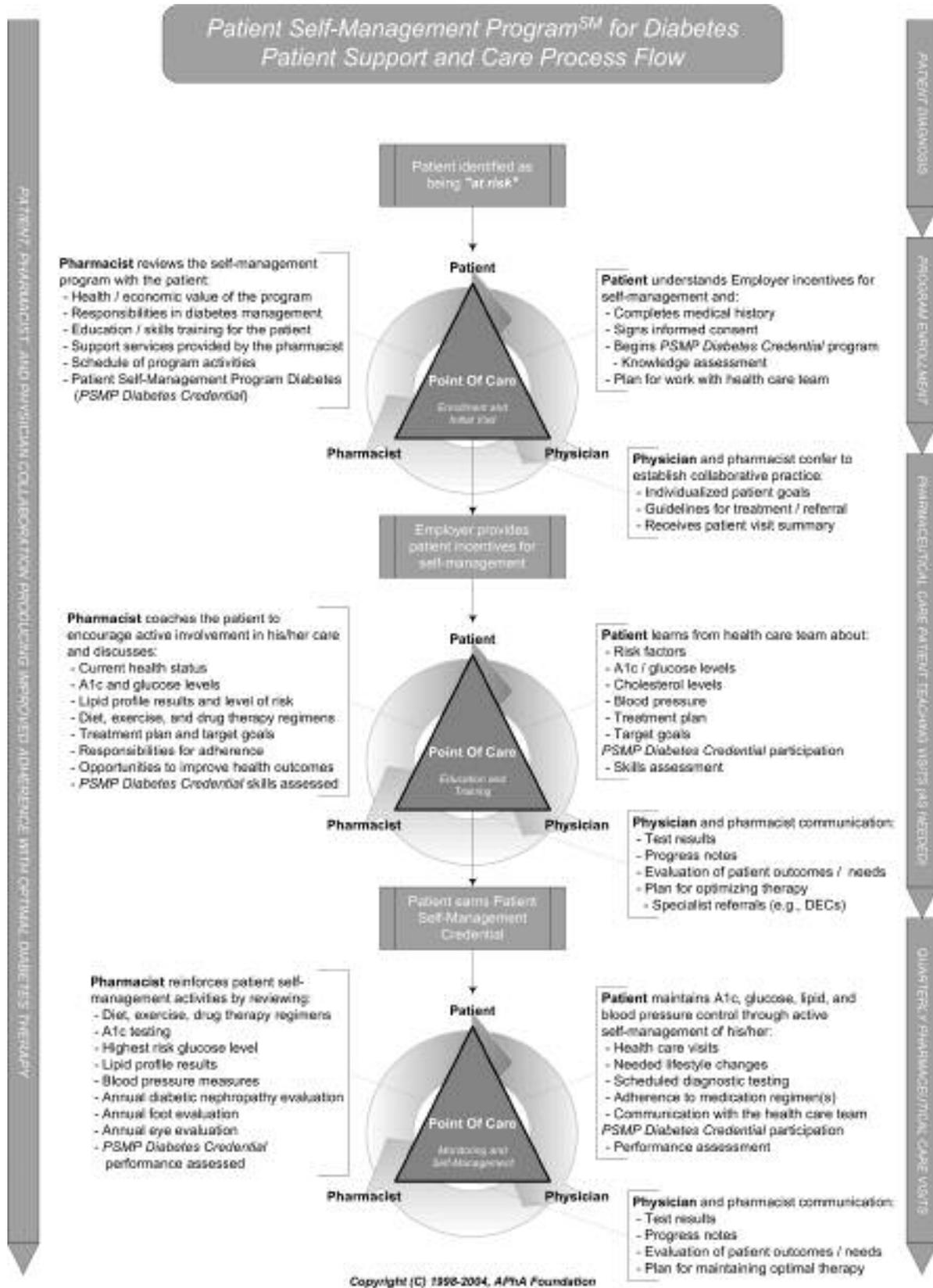


Figure 1. Patient Support and Care Process Flow

tained ongoing communications with patients, their physicians, diabetes educators, and other specialist providers involved in their patients' care. Follow-up meetings with patients were scheduled for every 3 months (or more often when needed). Patients were actively involved in their therapy, treatment plans, goal setting, and performance monitoring.

Knowledge, Skills, and Performance Assessments

The APhA Foundation contracted with Knapp & Associates International, Inc., to develop psychometrically validated tools for assessing each patient's knowledge, skills, and performance for self-management of diabetes. Patients were assessed by their pharmacist according to a structured process of care to help each patient achieve the APhA Foundation PSMP Diabetes Credential. The assessments were designed to help the pharmacists identify areas in which each patient needed additional education and what diabetes care standards needed to be addressed. The overall goal of the credential is to serve as an empowerment tool and to assist in standardizing the care goals for all patients.

Study Design and Timeline

This was a quasi-experimental, longitudinal, pre-post comparison group study. Subjects were employees or covered dependents with diabetes who accepted their employer's offer of an additional health benefit at no charge and incentives for participation. As noted above, participating pharmacist care providers were community pharmacists who had received certificate training in diabetes care.

Patient enrollment began in January 2003 and continued based on employer-specific enrollment timetables. Data collection continued through September 2004.

Inclusion Criteria and Data Measurement

Enrolled patients who had baseline and ending (at least 3 months after enrollment) A1C values were included in the clinical data analysis. Behavioral goal setting rates and achievement for patient self-management of nutrition, exercise, and weight were based on patient

self-reports and documented by the pharmacists during each patient visit. Knowledge, skills, and performance assessments were administered by pharmacists, and these data were analyzed and used for psychometric validation by Knapp & Associates.

Patient satisfaction was recorded on surveys using two instruments that were developed for the purposes of this study.³ One survey on overall satisfaction with diabetes care was administered at baseline during the initial patient visit and then 6 months after enrollment at a follow-up patient visit. A survey that measured satisfaction with care from the pharmacist was administered after 6 months of enrollment.

Economic data were submitted by the employers for all patients with medical and pharmacy claims data for a baseline period of 365 days before enrollment and for 365 days after enrollment. Medical claims included paid claims for hospital, emergency, outpatient, physician, and diabetes education center services for all conditions for which patients were treated. Pharmacy claims covered expenditures for all medications and covered supplies received by the patient. Claims for pharmacist care services were captured separately. The format for data reporting was developed by the pilot site implementation committee (described below) as a standard description of cost changes for presentation to their companies' internal stakeholders. Projected costs for the study year were based on national market changes as agreed to by the pilot site implementation committee employers and health benefit consultants.

Outcome Definitions

Clinical outcome measures mirrored those used in the *State of Health Care Quality: 2004 Report* from the National Committee for Quality Assurance (NCQA).⁷ The following clinical indicators were measured: A1C, LDL-C, systolic blood pressure, diastolic blood pressure, current influenza vaccination, current foot examination, and current eye examination.

Patient satisfaction with overall diabetes care was measured on an 10-point Likert scale (1 to 10), and patient satisfaction with pharmacist care was measured on a 5-point Likert scale (1 to 5).

Patient self-management goal setting rate and achievement were based on standards set by clinical expert interviews. Knowledge, skills, and performance were assessed based on standards set by a

Table 2. Improvements in Clinical Parameters During Pharmacists' Interventions

Parameter (no. patients)	Mean (SD) Beginning Measure	Mean (SD) Ending Measure	Mean Change (SD)	Mean Duration (months)	P value ^a
A1C (256) (%)	7.9 (1.8)	7.1 (1.4)	-0.8 (1.5)	10.9	< .001
LDL-C (248) (mg/dL)	113.4 (35)	104.5 (33.5)	-8.9 (28.7)	9.7	< .001
Systolic BP (247) (mm Hg)	136.2 (17.6)	131.4 (16.4)	-4.8 (16.2)	10.4	< .001
Diastolic BP (247) (mm Hg)	81.4 (10.5)	79.1 (10.7)	-2.3 (10.2)	10.4	< .001

Abbreviations used: A1C, glycosylated hemoglobin; LDL-C, low-density lipoprotein cholesterol; BP, blood pressure.

^aP value calculated by applying a two-tailed Student *t* test for paired data to the mean (SD) change data.

Table 3. Comparison of PSMP Clinical Results with HEDIS Measures for Patients with Diabetes in Baseline (2002) and Intervention (2003) Years

HEDIS Commercial Indicator	2002 ^a		2003 ^a	
	HEDIS % Patients	PSMP % Patients	HEDIS % Patients	PSMP % Patients
Tested for A1C	82.6	78	84.6	100
Poor A1C control	33.9	22	32.0	6
Tested for lipid profile	85.1	54	88.4	97
LDL-C < 100 mg/dL	NA	38	30.7	49
Current eye examinations	51.7	46	48.8	82
Immunized against influenza	NA	52	48.0	77
Current foot examinations	NA	38	NA	80

Abbreviations used: A1C, glycosylated hemoglobin; HEDIS, Health Plan Employer Data and Information Set; LDL-C, low-density lipoprotein cholesterol; NA, not available; PSMP, Patient Self-Management Program.

^aFigures shown represent the mean percentages of participants in commercially accredited plans (for HEDIS) or actual percentage of study participants (for PSMP) meeting indicator in year shown.

panel convened by Knapp & Associates for validation of the PSMP Diabetes Credential. Based on standard criteria, each patient was assigned an achievement level of beginner, proficient, or advanced for each assessment domain (knowledge, skills, and performance).

Economic outcomes were measured based on standards established by a pilot site implementation committee consisting of the pilot site employers and their designated health benefit consultants. Cost analysis was conducted on baseline and study period health care costs versus projected health care cost increases^b and compared with projected costs for diabetes as reported by the National Business Group on Health (NBGH) at www.DiabetesAtWork.org.

Data Sources and Analysis

Demographic data were obtained from the enrollment forms completed by the patients. Clinical and behavioral goal data were recorded by the pharmacists after each patient visit on a secure Web site in the Diabetes Medication Therapy Management module developed to support the PSMP Diabetes. This Web resource was designed based on the electronic health data management principles previously outlined by the APhA Foundation.⁸ Data for knowledge, skills, and performance assessment validation were submitted to Knapp & Associates. Patient satisfaction survey data were sent to the APhA Foundation for data entry. Economic data were sent from the medical and pharmacy claims administrators to the APhA Foundation for collation. Clinical, behavioral, patient satisfaction, and economic data were merged into a relational database based on unique deidentified patient codes.

Data were combined from all sites to create one aggregate cohort. The analysis, using the two-tailed Student *t* test for paired

Table 4. Improvement in Patient Lifestyles During Study (n = 256)

Lifestyle Parameter	Baseline	End of Study ^a	
	% Patients	% Patients	% Improvement
Nutrition goal present	25	77	213
Nutrition goal achieved	38	61	60
Exercise goal present	25	81	218
Exercise goal achieved	39	56	45
Weight goal present	25	73	194
Weight goal achieved	32	39	22

^aMean of 11.4 months after baseline.

data, compared outcomes from the prestudy baselines that were collected at the initial patient visit for clinical outcomes with the ending results at the last patient visit included in the study period. The a priori level of significance was set at $P < .05$.

Results

A total of 256 patients met the inclusion criteria based on availability of a baseline A1C and an ending A1C at least 3 months after enrollment (Table 1). The mean (\pm SD) duration of enrollment was 11.4 ± 4.1 months. The population consisted of 60% women and 40% men, with an average age of 55 years. Patient ethnicity was as follows: African American, 77 (30%); Asian, 7 (2.5%); Caucasian, 160 (63%); Native American, 4 (1.5%); Pacific Islander, 1 (0.5%); and not specified, 7 (2.5%). Education distribution was as follows: eighth grade or less, 2%; some high school, 6%; high school graduates, 35%; some college, 28%; college graduates, 13%; and post-graduate education, 15%.

Clinical Outcomes

Significant improvements were identified for enrolled patients using beginning and ending A1C, LDL-C, and systolic and diastolic blood pressures (Table 2). For the primary clinical indicator in diabetes, A1C, a reduction of 0.8 percentage point was observed in A1C levels over a 10.9-month period. Increases were noted of 21%, 28%, and 55% in percentages of patients achieving A1C goals of the Health Plan Employer Data Information Set (HEDIS; A1C goal is 9%), the American Diabetes Association (A1C goal is 7%), and the American Association of Clinical Endocrinologists (A1C goal is 6.5%), respectively. Mean LDL-C decreased significantly, with a 31% increase in number of patients achieving the National Cholesterol Education Program Adult Treatment Panel III goal of 100 mg/dL. A 28% increase was noted in number of patients with systolic blood pressure values below 130 mm Hg, the goal of Joint National Committee (JNC) VII. The JNC VII diastolic blood pressure goal of 80 mm Hg was achieved by 20% more

patients at study end than at baseline.

Diabetes and Lifestyle Outcomes

Improvements in the diabetes process of care indicators, as compared with performance of commercially accredited health plans based on the HEDIS Indicators of NCQA, show that all diabetes process of care indicators and ending results were notably higher among PSMP participants than for patients covered by commercially accredited health plans (Table 3).

The self-management nature of this intervention produced notable improvements in the attention patients paid to nutrition, exercise, and weight (Table 4). Identification of goals—and achieving them—increased substantially as a result of these strategies.

PSMP Diabetes Credential Assessment

Credential assessment data were submitted separately to Knapp and Associates and analyzed in detail for psychometric validation. As measured by the PSMP Diabetes Credential, patients' aggregate achievement scores were as follows: for knowledge, 23% beginner, 61% proficient, and 16% advanced; for skills (n = 179), 22% beginner, 55% proficient, and 23% advanced; and for performance (n = 146 patients), 18% beginner, 53% proficient, and 29% advanced.

Patients and pharmacist providers indicated that they valued this

systematic tool used to individualize the educational sessions for each patient. The relationship of the credential assessment status to diabetes self-management continues to be evaluated.

Patient Satisfaction Outcomes

The percentage of patients with overall satisfaction with diabetes care in the highest range (8–10 on a 10-point scale) increased from 57% at baseline to 87% after 6 months of participation in the project. Overall, 95.7% of respondents were satisfied or very satisfied with pharmacist care. Further analysis of these results will be reported later.

Economic Outcomes

The economic analysis showed that baseline health care cost distributions were 69% for inpatient and outpatient medical services versus 31% for medication. These shifted to 56% and 44%, respectively, after implementation of medication management services. Mean total health care costs were reduced by \$918 (10.8%) per patient per year from the employers' projected expenditures (\$9,382–\$8,464; Table 5). When compared with the NBGH mean annual medical costs based on gender and age distribution, costs savings were estimated at \$2,750 per patient during the first year of PSMP Diabetes (\$11,214–\$8,464).

Table 5. Cost Analysis of Patient Self-Management Project (n = 165)

Aggregate PSMP Cost Category	Baseline \$	Projected for Study Year ^a \$	Actual for Study Year \$	Actual Variance %	Variance from Projected %
<i>Medical costs for enrolled patients^b</i>					
Employer payments	871,544	984,845	732,435	(19.0)	(34.5)
Employee copayments	41,678	47,096	49,619	16.0	5.1
Total payments	913,222	1,031,941	782,054	(16.8)	(32.0)
Mean payment per patient	5,535	6,254	4,740	(16.8)	(32.0)
<i>Medication costs for enrolled patients^b</i>					
Employer payments	353,206	416,785	509,923	30.7	18.3
Employee copayments	84,089	99,225	46,631	(80.3)	(112.8)
Total payments	437,297	516,010	556,554	21.4	7.3
Mean payment per patient	2,650	3,127	3,373	21.4	7.3
<i>Medication therapy management costs</i>					
Employer payments			57,920		
Mean cost per patient			351		
Mean total health care costs	1,350,519	1,547,951	1,396,528	3.3	(10.8)
Comparative NBGH estimation ^c	1,614,257	1,850,245			(32.5)
Mean total health care cost per patient	8,185	9,382	8,464		
Comparative NBGH mean cost per patient ^c	9,783	11,214			

Abbreviation used: NBGH, National Business Group on Health.

^aColumn represents projected costs if no plan changes had been made and average market increases were applied.

^bAll patients enrolled for 90 days or more with two evaluable A1C values were included in this calculation. A total of 44% of patients had lower medical claims during the study year than during the baseline year.

^cDiabetesAtWork.org projection for mean medical costs based on gender and age distribution of patients in this study.

Discussion

The overall goal of the PSMP Diabetes pilot project was to develop a scalable business model that could be implemented in diverse health care markets. To meet this goal, the APhA Foundation set out to engage five nationally known employers in demographically diverse settings to participate in the development and implementation of this model.

The outcome measurements and metrics presented in this paper were established by the employers at the outset as key indicators of the program's effectiveness. Our plan was to develop a turnkey model that any employer in any market could use to improve health outcomes for people with diabetes while controlling costs. It was also our intent to provide those employers who implemented the program with a meaningful results-reporting system on which they could make data-driven health care and business decisions.

From the employers' perspective, the key findings of this program included the following:

- Diabetes control improved remarkably, compared with both baseline and national standards such as HEDIS. PSMP Diabetes patients had mean A1C levels of 7.1%, near the goal of 7.0% set by the American Diabetes Association.
- Other key indicators of diabetes care—such as influenza vaccinations, blood pressure, lipid profiles, and the percentage of patients receiving foot and eye examinations—also improved substantially.
- More than 95% of the patients reported that they were either very satisfied or satisfied with care provided by the program pharmacists.
- Employers were able to evaluate the economic impact of the program across the spectrum of total health care costs, as compared with their previous silo-based evaluations that considered medical and pharmacy claims separately. This is important because baseline health care cost distributions shifted from 69% to 56% for inpatient and outpatient medical services with a corresponding shift from 31% to 44% for medication and medication-management services.
- Substantial reductions in total health care costs were demonstrated based on employers' projections and national data for demographically similar patients.

Additional proof of the value of the program and the utility of the outcomes measured is evidenced by the decision from all of the participating employer sites to continue the program beyond the pilot and to expand it to other sites in their organizations.

Limitations

Interpretation and generalizability of these data are limited by the lack of a true control group. The outcomes analysis was intended from the outset to meet the needs of employers to make decisions on eventual continuation of the program. Industry standard economic data reporting sets are not available for medical and pharmacy claims data. Because of this, we developed a standard

template for requests for these data that data claims vendors were not always able to report completely. We were able to obtain paid claims data sufficient to satisfy the employers in the pilot project. In the future, we suggest that employers be very specific with their claims processors about detailed reporting needs to support more rigorous analysis of shifting health care costs when implementing programs such as this one.

Conclusion

The PSMP Diabetes is built on the philosophy that better health leads to lower medical costs. Ambulatory care patients ultimately manage their own care, and this program is intended to help employees with diabetes adhere to treatment plans, act as a bridge to physicians and other health care providers, reduce overall health care costs, and increase productivity. The results from PSMP Diabetes offers further validation that using pharmacists who receive special training in diabetes disease management will improve patients' health, enhance patients' satisfaction with diabetes care, and reduce overall health care costs for people with diabetes. The PSMP model is beneficial to large and small companies in diverse markets. This program realigns incentives in the health care system to ensure that the patient remains the focal point in the care process, works collaboratively with their health care providers, and becomes an active partner in managing their disease to achieve better outcomes.

^aDavid P. Nau, PhD, Assistant Professor, College of Pharmacy, University of Michigan, developed the patient satisfaction surveys for the PSMP Pilot Project and is conducting further analysis for future publication.

^bSeth Serxner, PhD, MPH, Exploring Evaluation Methodologies for Disease Management, National Business Coalition on Health. November 15, 2004, Atlanta, Ga.

References

1. Bluml BM, McKenney JM, Cziraky MJ. Pharmaceutical care services and results in Project ImPACT: Hyperlipidemia. *J Am Pharm Assoc.* 2000;40:157-65.
2. Cranor CW, Christensen DB. The Asheville Project: short-term outcomes of a community pharmacy diabetes care program. *J Am Pharm Assoc.* 2003;43:149-59.
3. Cranor CW, Bunting BA, Christensen DB. The Asheville Project: long-term clinical and economic outcomes in a community pharmacy diabetes care program. *J Am Pharm Assoc.* 2003;43:173-84.
4. Garrett DG, Martin LA. The Asheville Project: participants' perceptions of factors contributing to the success of a Patient Self-Management Program for Diabetes. *J Am Pharm Assoc.* 2003;43:185-90.
5. Garrett D, Eckel F. The Asheville Project: a special report. *Pharm Times.* 1998(suppl):3-31.
6. Connolly C. In N.C., improving worker health—cutting costs. *Washington Post.* 2002(Aug 20):A1.
7. NCOA state of quality of health care report. Washington, D.C.: National Committee for Quality Assurance; 2004.
8. Bluml BM, Crooks GM. Designing solutions for securing patient privacy—meeting the demands of health care in the 21st century. *J Am Pharm Assoc.* 1999;39:402-7.