

The Diabetes Ten City Challenge: Interim clinical and humanistic outcomes of a multisite community pharmacy diabetes care program

Toni Fera, Benjamin M. Bluml, William M. Ellis, Cynthia W. Schaller, and Daniel G. Garrett

Abstract

Objective: To assess clinical and humanistic outcomes 1 year after initiating the Diabetes Ten City Challenge (DTCC), a multisite community pharmacy health management program for patients with diabetes.

Design: Interim observational analysis of deidentified aggregate data from participating employer clients.

Setting: 29 employers at 10 distinct geographic sites contracting for patient care services with pharmacy providers in the community setting.

Participants: 914 patients with diabetes covered by self-insured employers' health plans who received 3 or more months of pharmacist care and had an initial glycosylated hemoglobin (A1C) measurement. Community-based pharmacists were trained in a diabetes certificate program and reimbursed for clinical services.

Interventions: Community-based pharmacists provided patient care services using scheduled consultations, clinical goal setting, a validated patient self-management program tool, and health status monitoring within a collaborative care management model.

Main outcome measures: Changes in key direct and surrogate outcomes, including glycosylated hemoglobin (A1C), low-density lipoprotein (LDL) cholesterol, blood pressure measurements, and body mass index; influenza vaccinations; foot examinations; eye examinations; numbers of patients with goals for nutrition, exercise, and weight; and patient satisfaction.

Results: At initial visit compared with 1 year, mean A1C decreased from 7.6% to 7.2%, mean LDL cholesterol decreased from 96 to 93 mg/dL, and mean systolic blood pressure decreased from 131 to 129 mm Hg. Increases were seen for influenza vaccination rate (from 43% to 61%), eye examination rate (from 60% to 77%), and foot examination rate (from 38% to 68%) for the initial visit to the end of the analysis period. For all patients in DTCC, those who perceived that their overall diabetes care was very good to excellent increased from 39% to 87%. Overall, 97.5% reported being very satisfied or satisfied with the diabetes care provided by pharmacists.

Conclusion: Employers demonstrated a willingness to offer a voluntary health benefit to employees and their dependents with diabetes that uses pharmacists to help participants achieve self-management goals. Patients participating in the first year of DTCC had measurable improvement in clinical indicators of diabetes management, higher rates of self-management goal setting, and increased satisfaction with diabetes care. Based on results of previous studies, these positive trends are expected to drive a corresponding decline in projected total direct patient medical costs.

Keywords: Diabetes Ten City Challenge, Patient Self-Management Program, pharmaceutical care, diabetes, disease management, chronic disease, quality of life, health care costs, health outcomes, health benefits, collaborative practice, Asheville Project.

J Am Pharm Assoc. 2008;48:181-190.
doi: 10.1331/JAPhA.2008.07166

Received December 18, 2007, and in revised form February 7, 2008. Accepted for publication February 12, 2008.

Toni Fera, PharmD, is Director, Patient Self-Management Programs; **Benjamin M. Bluml, BPharm**, is Vice President for Research; **William M. Ellis, BPharm, MS**, is Chief Executive Officer; **Cynthia W. Schaller, MBA**, is Director of Operations; and **Daniel G. Garrett, BPharm, MS, FASHP**, is Senior Director, Medication Adherence Programs, American Pharmacists Association (APhA) Foundation, Washington, D.C.

Correspondence: Toni Fera, PharmD, APhA Foundation 1100 15th Street, NW, Suite 400, Washington, D.C., 20005. Fax: 202-638-3793. E-mail: tfera@aphanet.org

Disclosure: Other than employment by the APhA Foundation and development of the APhA Foundation's Web-based documentation system by Mr. Bluml, the authors declare no conflicts of interests or financial interests in any product or service mentioned in this article, including grants, gifts, stock holdings, or honoraria.

Funding: GlaxoSmithKline, Inc.

Acknowledgments: The Patient Self-Management Program is a Service Mark of the APhA Foundation.

According to the Centers for Disease Control and Prevention, diabetes affects 20.8 million people in the United States (7% of the total population).¹ By 2050, that total is projected to increase to 39 million people. Many of these individuals are part of the U.S. workforce and an important part of the country's economy. Diabetes costs the nation nearly \$132 billion a year (\$92 billion in direct medical costs). The National Diabetes Education Program (NDEP) states that employees involved in their own self-management typically have better outcomes. Individuals who are active self-managers, in addition to their working to improve glycemic control, experience fewer complications from comorbidities such as stroke, heart disease, and renal disease. They are also more productive at home and at work. In its White Paper, "Making a Difference: The Business Community Takes on Diabetes," NDEP issues a call to action to employers "to improve diabetes care and education (because that) will help workers remain productive, decrease diabetes-related complications, and reduce associated costs over time. A

At a Glance

Synopsis: In its initial year of operation, the Diabetes Ten City Challenge demonstrated improvements in mean glycosylated hemoglobin (from 7.6% to 7.2%), low-density lipoprotein cholesterol (from 96 to 93 mg/dL), and systolic blood pressure (from 131 to 129 mm Hg). A total of 29 self-insured employers contracted for patient care services in this collaborative health management program, with community pharmacists coaching 914 patients with diabetes on effective self-management strategies to improve medication adherence. The percentage of patients with current influenza vaccinations increased from 43% to 61%, current eye examinations from 60% to 77%, and current foot examinations from 38% to 68%. Patients with self-management goals for nutrition, exercise, and weight increased from 22% to 66%, from 24% to 72%, and from 23% to 64%, respectively.

Analysis: *The U.S. Centers for Disease Control and Prevention estimates that, of the approximately \$2 trillion spent by public and private sectors on health care in 2005, more than 75% went toward treatment of chronic disease. The Partnership to Fight Chronic Disease reports that chronic diseases such as diabetes, if left unchecked, have the potential to bankrupt our health care system. The indirect costs of chronic disease, resulting from factors such as absenteeism and reduced on-the-job productivity far outweigh the cost of treatments. By investing in aligned incentives and keeping patients with diabetes healthy, productive, and on the job, employers can expect to see considerable moderation of increases in overall health care costs over the long term.*

dedicated effort and financial investment at the senior management level are essential to achieving these goals."²

Researchers have also shown that decreased adherence to treatment regimens leads to increased hospitalizations and mortality in patients with diabetes, thereby increasing the costs associated with this disease in both human and economic terms.³ Previously published research, such as that conducted by the American Pharmacists Association (APhA) Foundation and researchers in the Asheville Project, has discussed the important role of patients in self-managing their disease.⁴⁻⁸ This research has shown that when patients become effective self-managers, with the support of a pharmacist coach, considerable improvements in clinical care are achievable while decreasing total health care costs.

In light of the success achieved by the APhA Foundation's Patient Self-Management Program and other clinical care programs that include pharmacists, keen interest has arisen for testing the scalability of the patient self-management/pharmacist coach model in diverse communities. Successful implementation of such a model on a broad scale would have the capacity to transform the health care system by improving outcomes and controlling costs. In 2005, the APhA Foundation, with support from GlaxoSmithKline, set out to test the scalability of this model in 10 unique locations across the country, through the Diabetes Ten City Challenge (DTCC). The ongoing project includes components that are hallmarks of Foundation projects and programs, including aligned incentives, collaborative care, and a validated patient self-management credentialing process for diabetes. DTCC established a voluntary health benefit for employees and dependents who are deemed eligible under the employers' benefit, provided incentives through waived copayments for antidiabetic medications and related supplies, and helped people manage their diabetes with support from a pharmacist coach in collaboration with physicians and diabetes educators.

The findings presented in this article include clinical and humanistic results from the first year of implementation of DTCC.

Objectives

DTCC is designed to establish a voluntary health benefit for employers in 10 distinct geographic areas of the United States, with an enrollment goal of approximately 125 patients at each site for a minimum duration of 12 months. The program objectives are

- To implement an employer-funded, collaborative health management program using community-based pharmacist coaching, evidence-based diabetes care guidelines, and self-management strategies designed to keep patients with diabetes healthy and productive.
- To implement the patient self-management training and assessment credential that equips patients with the knowledge, skills, and performance-monitoring priorities needed to actively participate in managing their diabetes.

- To assess participant satisfaction with overall diabetes care and pharmacist care provided in the program.

Methods

Setting

DTCC was offered as a voluntary benefit by employers at 10 distinct geographic sites that included both individual employers and coalitions of employers. Employers were recruited on a rolling basis, so most employers started at different times (Table 1). DTCC locations were selected for their diversity in terms of size, demographics, and geography, in order to test the model in a variety of circumstances.

The program was offered in community independent pharmacies, in community chain pharmacies, in ambulatory care clinics, and at on-site workplace locations if designated by the employer. The sites included the following characteristics.

- Private area for patient consultation
- Management support freeing pharmacists for patient care activities
- Access to Internet for recording and tracking patient care interventions
- Availability of pharmacist coach with demonstrated communication skills and specialized training or certification in diabetes management

The model was designed to allow sufficient flexibility to accommodate the different practice settings represented in the program, the specific demographics of the patient population served, and practice arrangements made within local and/or regional health care market places, including contracts with pharmacist networks to provide patient care services.

Intervention

The practice model implemented for DTCC is designed as a collaborative care model that emphasizes the roles of the employer, physician, pharmacist, and patient. The employer/payer agreed to invest in incentives for patients and pharmacist providers. At a minimum, these incentives included waived copayments for antidiabetic medications and related supplies. Some employers added other incentives as a way to integrate the program into their existing plan offerings. Examples included counting participation toward wellness points, waiving copayments for diabetes-related medications, diabetes education classes, and/or laboratory test copayments. The employer recruited patients into the program through various announcement methods, including direct mailings, e-mail blasts, newsletters, and live orientation sessions. All patients were required to enter into a program participation agreement, which included information about how the program works, their responsibility as a participant in the program, their right to confidentiality, how data would be reported to the employer, and their right to withdraw from the program at any time. In addition, the participants completed an enrollment form, including authorization to release medical information. This consent was provided to

Table 1. Diabetes Ten City Challenge sites

Charleston, S.C.
Chicago
Colorado Springs, Colo.
Cumberland, Md.
Honolulu, Hawaii
Milwaukee, Wis.
Northwest Georgia
Pittsburgh, Pa.
Los Angeles
Tampa Bay, Fla.

pharmacists so that they could obtain relevant laboratory and other information from other health care providers. Patients were also asked to complete a baseline diabetes care satisfaction survey and medical history form. They were instructed to complete the medical history form and bring it with them on the first visit with their pharmacist. Once enrolled in the program, the patient was assigned a unique identifier. Eligible participants selected their first- and second-choice pharmacist coach and/or location from a local pharmacy network directory. The enrollment period and program duration agreed to at each site was a minimum of 12 months.

Physicians were informed of participant enrollment and encouraged to share their care plan with the pharmacist, who reinforced that plan with participants. Pharmacists communicated with physicians after every visit, as necessary, and referred patients as needed to their physician (e.g., for referrals, laboratory test recommendations, or medication-related problems identified), dietitian (e.g., for intensive nutrition education), or diabetes education centers (e.g., for additional education support).

Pharmacists were assigned to a participant through their network coordinator. Once assigned, participant enrollment materials were transferred to the pharmacist, who contacted the patient to set up their first appointment. During regularly scheduled visits, pharmacists applied a prescribed process of care that focused on clinical assessments and progress toward clinical goals, established self-management goals specific to each patient, and included working with other health care providers to recommend adjustments in patient treatment plans. Pharmacists who participated in the program were required to complete an Accreditation Council for Pharmacy Education-accredited diabetes certificate training program or its equivalent, such as certification by the Board of Pharmaceutical Specialties as a pharmacotherapy specialist with experience in diabetes management. Pharmacists were instructed to follow American Diabetes Association (ADA) guidelines unless otherwise specified by the physician. Pharmacists collected subjective and objective assessment information, both self-reported and laboratory conducted. Assessment data were then entered into the APhA Foundation's Web-based documentation system.

Pharmacists were reimbursed by employers for patient visits according to fee schedules negotiated by the local pharmacy network.

Process of care

To ensure consistent application of the care model, the pharmacists were required to attend additional training on the Patient Self-Management Program for Diabetes process of care (Figure 1), documentation forms, Patient Self-Management Credential for Diabetes, and the documentation system. Patients worked with their pharmacist through a structured series of visits that focused on knowledge, skills, and performance, and patients were "scored" as either beginner, proficient, or advanced in these three domains. These assessments were designed to help the providers understand the area(s) in which each patient needed additional education and the diabetes care standards upon which each patient needed to improve. The overall goal of the credential is to serve as an empowerment tool and to assist in standardizing care goals for all patients.

At the first visit (or series of visits), the pharmacist assessed the patient's knowledge about their diabetes, reviewed the program requirements, and reviewed any existing patient goals and his or her medical history. The pharmacist, after meeting with the patient and identifying their primary physician, sent an introduction letter informing the physician of the patient's participation in the program and a progress note. (In some instances, the introduction letter was sent by the employer or network.)

Ongoing visits focused on clinical and self-management credential assessments and progress on related goals. Laboratory tests were periodically performed at the physician's office, at the designated lab, or by point-of-care testing. Key laboratory indicators and patient goals were documented on a trifold documentation form that provided the basis for ongoing monitoring and communication between patients and health care providers. Patients were provided with a copy of this form for reference between visits. The clinical data and visit documentation were also entered via the APhA Foundation's Web-based system.

Over the course of the enrollment period, pharmacists worked through the self-management credential domains with patients. Visits were scheduled by appointment, usually once a month for the first 3 months, then at least quarterly or more often if deemed necessary by the pharmacist. Pharmacists coached patients and worked with them to set goals. Pharmacists maintained ongoing communication with patients, their physicians, diabetes educators, and other specialist providers involved in the patient's care. Patients were actively involved in their therapy, treatment plans, goal setting, and performance monitoring.

Design

This report is an observational analysis of deidentified aggregate data collated from initial reports developed for par-

ticipating employers. Program participants were employees or other eligible beneficiaries with diabetes who volunteered to participate in the program at no charge, agreed to regular meetings with matched pharmacists, and were eligible for designated incentives provided for participation. As described above, the providers were community-based pharmacists who received certificate training in diabetes care or equivalent.

Inclusion criteria and data measurement

Patients at the 10 different sites were enrolled into the program. See Table 1 for a listing of sites. Patients who had an initial glycosylated hemoglobin (A1C) recorded and at least 3 months of pharmacist care were included in clinical data analysis, resulting in aggregated data for 914 patients. Clinical laboratory data were obtained from the physician, laboratory, or point-of-care testing.

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 and are reported for the patients meeting inclusion criteria. Knowledge, skills, and performance assessments were administered by pharmacists for patients in a manner consistent with the psychometrically validated credential. (Note: The Patient Self-Management Credential for Diabetes is an externally validated tool developed by the APhA Foundation.) Subjective and objective data were submitted via the Foundation's Web-based documentation system.

Patient satisfaction was recorded on surveys using two instruments that were previously developed and used.⁵ (Note: David P. Nau, PhD, Assistant Professor, College of Pharmacy, University of Kentucky, developed the patient satisfaction surveys for the program.) One survey on overall satisfaction with diabetes care was completed at baseline as part of the enrollment packet, and, approximately 6 months after enrollment at a follow-up patient visit, the survey was repeated. Another survey was administered after approximately 6 months of enrollment to measure satisfaction with care from the pharmacist. Completion of the survey was optional and the responder anonymous; therefore, we are not able to match the surveys to the aggregate population.

Timeline

Patient enrollment began in January 2006 and continued at each site dependent on employer-specific enrollment timetables. The ending point for data in this initial evaluation was September 30, 2007.

Outcome definitions

Clinical outcome measures included recognized standards for diabetes care and those used in the "State of Health Care Quality: 2006" report from the National Committee for Quality Assurance (NCQA).⁹ The following clinical indicators were measured: A1C, low-density lipoprotein (LDL) cholesterol, systolic blood pres-

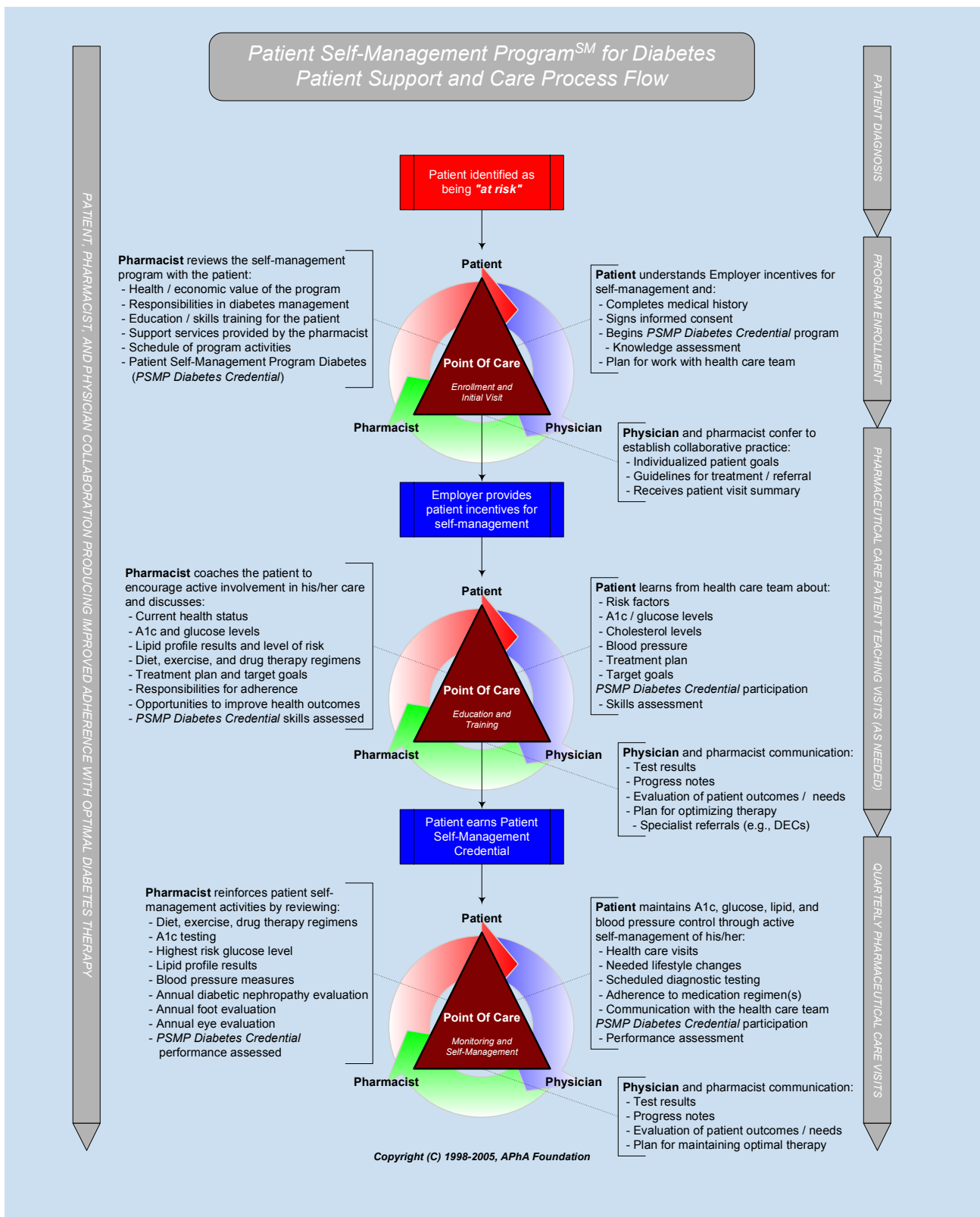


Figure 1. Patient Self-Management Program for Diabetes patient support and care process flow

Abbreviations used: A1C, glycosylated hemoglobin; DEC, diabetes educator; PSMP, Patient Self-Management Program.

sure, diastolic blood pressure, current influenza vaccination, current foot examination, and current eye examination.

Patient satisfaction with overall diabetes care was measured on a 10-point Likert-type scale, and patient satisfaction with pharmacist care was measured on a 5-point Likert-type scale.

Knowledge, skills, and performance assessments were evaluated based on the Patient Self-Management Credential standards. Each patient was assigned an achievement level of beginner, proficient, or advanced for each assessment domain.

Data sources

Aggregated, deidentified data were collated from employer reports that included the designated measures for general demographics, clinical, behavioral, and patient satisfaction data. These data were recorded in the Web-based documentation system by the pharmacists after each patient visit. This Web-based resource was designed based on the electronic health data management principles previously outlined by the APhA Foundation.¹⁰ Patient satisfaction survey data were sent by the employer (upon enrollment) or by participants (at follow-up) directly to the APhA Foundation for data entry.

Data analysis

Data were combined from all sites to create one aggregate cohort. The analysis compared initial and follow-up outcomes that were collected during the course of the patient care visits.

Results

Patient population characteristics

As previously described, 914 patients met the inclusion criteria and received pharmacist care for 3 or more months, with an average of 4.6 pharmacist visits per patient. The mean (\pm SD) duration of enrollment was 10.2 ± 3.7 months. The combined population consisted of 49% women and 51% men, with an average age of 53.4 years. Of patients, 72% were 50 years of age or older. Patient ethnicity was as follows: 77% white, 13% black, 4% Hispanic, 2% Asian, 1% Native American, 1% Pacific Islander, 1% other, and 1% not specified. Education distribution was as follows: 2% eighth grade or less, 3% some high school, 30% high school graduates, 31% some college, 22% college graduates, 8% postgraduate education, and 4% not specified. These characteristics are summarized in Figure 2.

Clinical outcomes

Using the two-tailed Student's *t* test for paired data, statistically significant improvements were found for the enrolled patients using beginning and ending A1C, LDL cholesterol, and systolic and diastolic blood pressure measures (Table 2). In the primary clinical indicator for diabetes, mean A1C decreased from 7.6% to 7.2% (a 5.2% reduction) and a 21% increase in ADA goal achievement of A1C less than 7% occurred. Mean LDL cholesterol decreased from 96.3 to 93.3 mg/dL, with an increase in

National Cholesterol Education Program Adult Treatment Panel III goal (LDL <100 mg/dL) achievement from 43.8% to 57.7%, an improvement of 32%.^{9,11} In this group, people who had an LDL measurement increased from 77% to 88%. Mean systolic blood pressure decreased from 131.3 to 128.7 mm Hg, with a 15.7% increase in the goal (130 mm Hg) recommended in the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7).¹² Mean diastolic blood pressure decreased from 79.3 to 77.3 mm Hg, with a 9.2% increase in JNC 7 goal achievement (80 mm Hg).

Diabetes care indicator outcomes

Table 3 summarizes the improvements in the diabetes process-of-care indicators compared with the Health Plan Employer Data and Information Set (HEDIS) indicators for NCQA commercially accredited health plans. DTCC participant results were notably higher than the HEDIS measures achieved by current health plans.⁹ The percentage of patients with current influenza vaccination increased from 43% to 61%, current eye examinations from 60% to 77%, and current foot examinations from 38% to 68%.

Patient self-management goal outcomes

At the beginning of the program, only 22%, 24%, and 23% of patients had individual self-management goals for nutrition, exercise, and weight, respectively. These percentages increased to 66% for nutrition, 72% for exercise, and 64% for weight at the ending visit.

Patient Self-Management Credential assessment

The Patient Self-Management Credential knowledge and skills assessment was used initially so that members of the health care team could identify potential knowledge and diabetes management skill gaps. Patients were expected to progress over time and improve their scores across all three domains. At the end of the reporting period, aggregate knowledge achievement scores were 4% beginner, 40% proficient, 48% advanced, and 2% not yet scored. The skills assessment was used during the first several visits to evaluate patient skill levels within six different categories. Aggregate skill achievement scores at the end of the reporting period were 11% beginner, 35% proficient, 32% advanced, and 32% not yet scored. The performance assessment was used periodically after the other two so that patients and providers could identify potential opportunities for ongoing performance improvement. Aggregate performance achievement scores were 12% beginner, 26% proficient, and 22% advanced. In this group, as a result of the limited time some patients had been in DTCC, 40% had not been scored for performance achievement at the time this article was prepared.

Patient satisfaction outcomes

Subjective responses at baseline and follow-up were evaluated for all program participants who submitted surveys. The

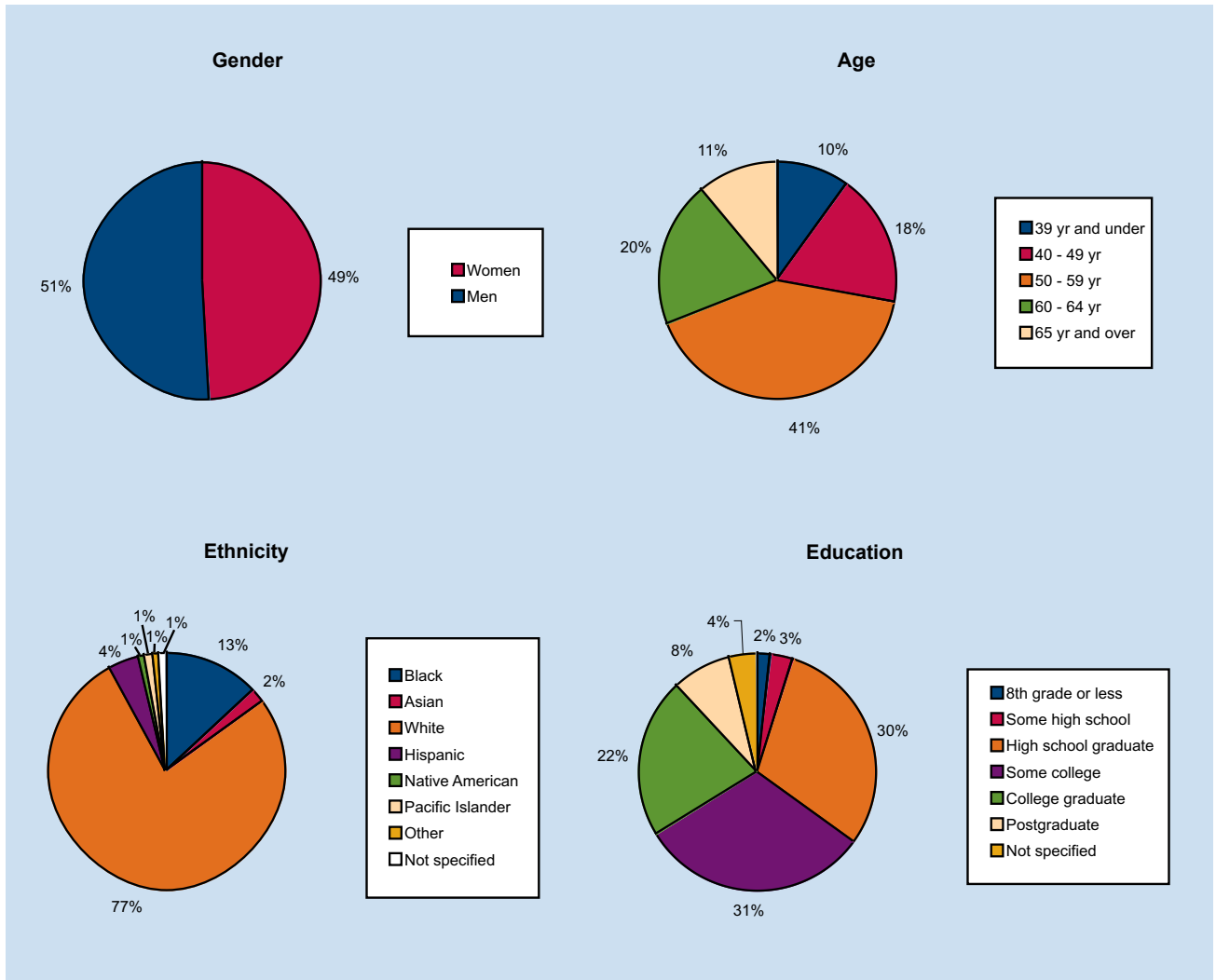


Figure 2. Summary of patient characteristics, DTCC

Abbreviation used: DTCC, Diabetes Ten City Challenge.

Table 2. Clinical indicator measures for patients in DTCC

Parameter (no. patients)	Beginning measure	Ending measure	Change	Duration	P ^a
	Mean ± SD	Mean ± SD	Mean ± SD	(months) Mean ± SD	
A1C, % (914)	7.6 ± 1.7	7.2 ± 1.4	-0.4 ± 1.2	10.2 ± 3.7	<0.001
LDL-C, mg/dL (815)	96.3 ± 31.5	93.3 ± 31.7	-3.8 ± 25.4	10.2 ± 3.7	<0.001
SBP, mm Hg (806)	131.3 ± 15.7	128.7 ± 15.6	-2.5 ± 15.9	10.2 ± 3.7	<0.001
DBP, mm Hg (806)	79.3 ± 10.1	77.3 ± 9.2	-2.3 ± 10	10.2 ± 3.7	<0.001

Abbreviations used: A1C, glycosylated hemoglobin; DBP, diastolic blood pressure; DTCC, Diabetes Ten City Challenge; LDL-C, low-density lipoprotein cholesterol; SBP, systolic blood pressure.

^aP value calculated by applying a two-tailed Student's t test for paired data to the mean ± SD change data.

Table 3. Comparison of DTCC and HEDIS process measures

HEDIS commercial indicator	HEDIS 2006 commercially accredited plans	DTCC (10.2 months)
	% Patients	% Patients
Tested for A1C	87.5	100 ^a
Good A1C control (A1C \leq 9%)	70.3	91.2
Tested for lipid profile	92.3	89.2
LDL-C \leq 100 mg/dL	43.8	57.7
Current eye examinations	54.8	76.9
Immunized against influenza	36.3 ^b	61.5

Abbreviations used: A1C, glycosylated hemoglobin; DTCC, Diabetes Ten City Challenge; HEDIS, Health Plan Employer Data and Information Set; LDL-C, low-density lipoprotein cholesterol; DTCC, Diabetes Ten City Challenge.

^aInclusion criteria.

^bAll adults.

participants were asked to rate their overall satisfaction with diabetes care on a scale of 1 to 10 (1, worst possible care; 10, best possible care). Satisfaction with pharmacist care was evaluated on a 5-point Likert-type scale (1, very dissatisfied; 5, very satisfied). The surveys have been previously used,⁵ and results are reported in Figure 3. For all patients in DTCC, those who perceived that their overall diabetes care was a 9 or 10 (excellent) increased from 39% to 87%. Of patients, 97.5% reported being very satisfied or satisfied with the diabetes care provided by the pharmacists.

Discussion

The overall goal of DTCC is to transform how the health care system manages chronic disease, by investing in aligned incentives and helping people self-manage their condition with the help of a pharmacist coach and a team of health care professionals. DTCC scales previous models developed in the Asheville Project and by the APhA Foundation and demonstrates that this model could be implemented in the diverse health care markets exemplified by the participating public and private employers in 10 geographic regions.

The clinical and humanistic outcome measurements and metrics presented in this report are those established as key indicators of the program's effectiveness. By implementing this standardized model, employers in a variety of markets can improve health outcomes for their health plan beneficiaries with diabetes. The system also provides employers with meaningful results to use in making data-driven health care and business decisions.

The key findings supported the employers' objectives for the program and included the following:

- Diabetes control improved during the 1-year of care, and mean A1C values were reduced from 7.6% to 7.2% for the

entire enrolled population in the first year of the program, approaching the goal for A1C set by ADA (<7.0%).

- Significant improvements have occurred in other key indicators of diabetes care, such as influenza vaccinations, recorded blood pressure, lipid profiles, and percentage of patients receiving foot and eye examinations, as outlined above.
- For most indicator categories, results have exceeded those of the HEDIS outcomes for commercially accredited plans.
- More than 97% of patients reported that they were either very satisfied or satisfied with the care provided by pharmacists in the program.
- In the next reporting phase of the program, employers will be able to evaluate the economic impact of the program across the spectrum of total health care costs.

Health benefit design

Consistent with the findings of prior APhA Foundation and Asheville Project studies, the clinical and humanistic outcomes for the first year of DTCC support the idea of a new employee benefit model for the management of chronic disease.

The Partnership to Fight Chronic Disease projects that, left unchecked, chronic diseases such as diabetes will negatively affect the U.S. economy and the nationwide employment base, with the very real potential to bankrupt the health care system in this country.¹³ Mays et al.¹⁴ point out that insurers and employers have responded to the burden of chronic disease by increasing their investment in disease management programs to help contain costs. However, the authors also note that a disconnect exists between disease management efforts to enhance adherence to treatment regimens and the higher patient cost sharing that can occur, which ultimately will be an impediment to patient involvement in disease management programs.

Within DTCC, the health benefit design offered to employees and their beneficiaries endeavors to align the incentives for all parties involved. Features of this employee health benefit include the following:

- Voluntary nature: Workers and their families must opt in to the program with the understanding that their individual clinical results will not be disclosed to the employer. The voluntary nature of the benefit starts the process of the patient choosing to address their disease in a proactive manner.
- Waived copayments: The program asks employers to waive copayments for antidiabetic and related medications as an incentive for patients to enroll and stay in the program. As previously reported, this economic incentive can be the decisive factor in enrollment.¹⁴ Out-of-pocket patient savings have been published at \$300 per patient per year; however, this can vary based on benefit design.⁵ The figure of \$300 can serve as an incentive to not only enroll but also stay in the program because the waived copayments can be dropped if the patient is not keeping regular appointments with the pharmacist coach.

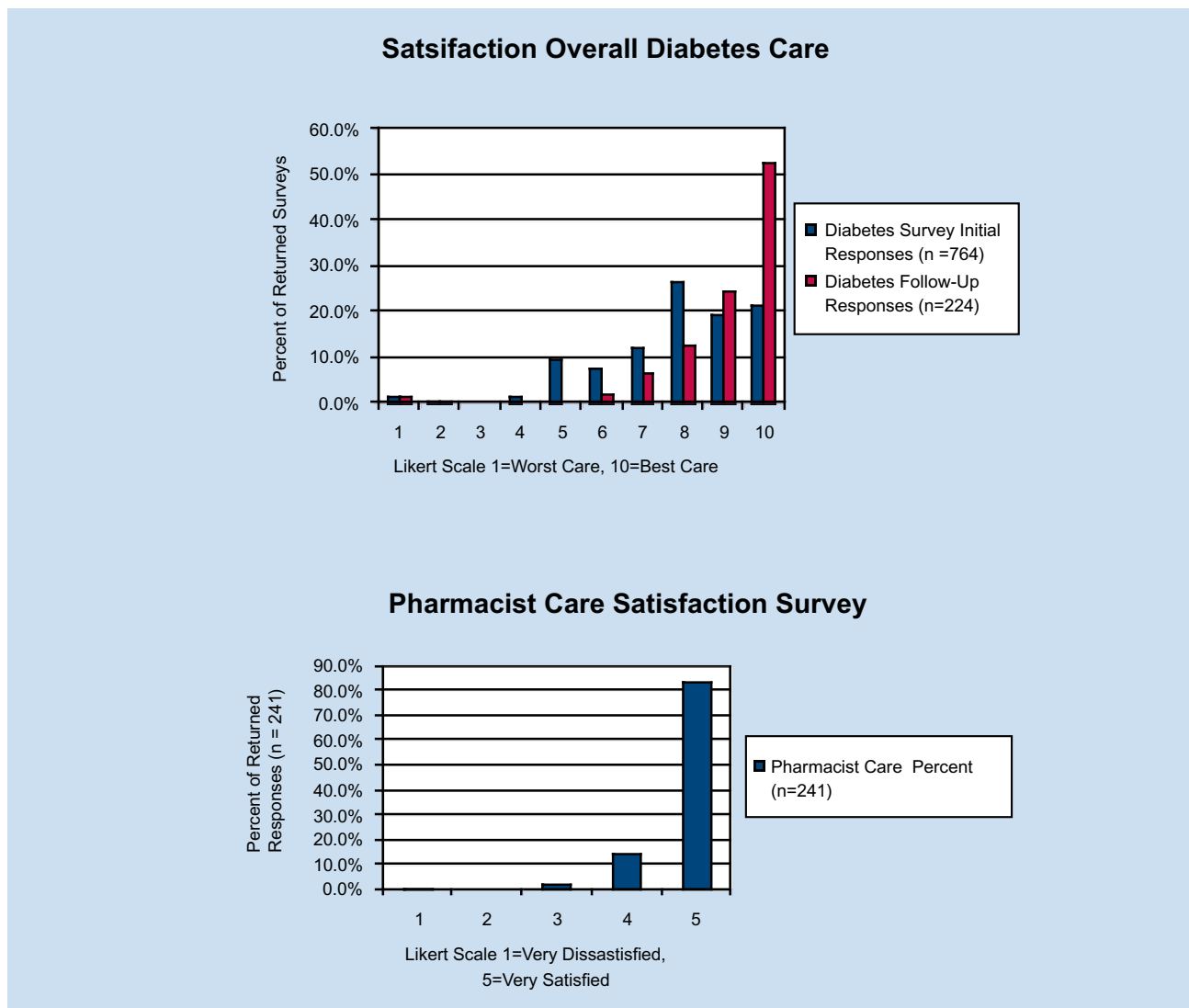


Figure 3. Participant satisfaction surveys, DTCC

Abbreviation used: DTCC, Diabetes Ten City Challenge.

- **Face-to-face contact:** Patients have reported that the face-to-face contact with a pharmacist and the other health care providers in this model helped them to be more accountable and supported in their efforts to self-manage their disease.⁸
- **Pharmacist and other health care provider services:** The pharmacist's time with the patient is compensated by the employer, thereby allowing this important aspect of the program to be sustained. In addition, the APhA Foundation recommends that the services of a diabetes education center also be made available by the employer to help reinforce the behaviors needed to successfully self-manage diabetes.
- **Physicians receive regular communication from the pharmacist on their patients,** which helps create a collaborative practice model and improve overall care.

- **Employer return:** Employers expect to receive savings on overall health care costs and the ability to offer a benefit with which participants are highly satisfied.

DTCC also shows that self-insured employers are interested in piloting new employee benefits that align the incentives for all parties in an attempt to mitigate the potentially catastrophic effect that chronic disease has on America's workforce. Recently, the Milken Institute reported that the total lost economic output related to diabetes was \$105 billion.¹⁵ Employers such as those in DTCC realize that the indirect impact of chronic disease—including absenteeism and reduced on-the-job productivity—far outweigh the cost of treatments. We believe that DTCC validates that this collaborative practice model can be replicated in diverse geographic locations among both public- and private-sector employers.

Limitations

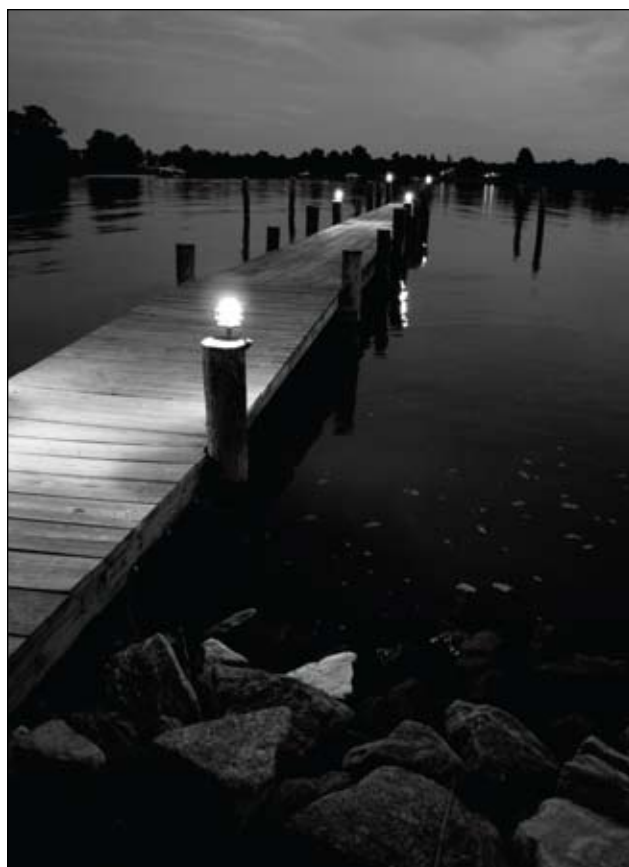
This is an observational interim report, and the outcomes analysis was intended from the outset to meet the needs of employers in improving the health of their workforce and their dependents with diabetes. In addition, the different starting dates for the participating employers has limited the data set for this interim report.

Conclusion

This interim DTCC report shows that the collaborative practice model using community-based pharmacist coaching, evidence-based diabetes care guidelines, and self-management strategies can play a key role in helping patients to successfully manage chronic disease. Patients participating in the first year of the program had measurable improvement in clinical indicators of diabetes management, higher rates of self-management goal setting, and increased satisfaction with diabetes care. In addition, 97.5% of patient survey respondents indicated that they were satisfied or very satisfied with pharmacist care.

References

- Centers for Disease Control and Prevention. Division of Laboratory Sciences: diabetes. Accessed at www.cdc.gov/nceh/dls/diabetes.htm, December 10, 2007.
- The National Diabetes Education Program. Making a difference: the business community takes on diabetes. Accessed at <http://ndep.nih.gov/resources/business/index.htm>, December 11, 2007.
- Ho PM, Rumsfeld JS, Masoudi FA, et al. Medication nonadherence increases hospitalization and mortality among patients with diabetes mellitus. *Arch Intern Med.* 2006;166:1836–41.
- Bluml BM, McKenney JM, Cziraky MJ. Pharmaceutical care services and results in Project ImPACT: Hyperlipidemia. *J Am Pharm Assoc.* 2000;40:157–65.
- Bluml BM, Garrett DG. Patient self-management program for diabetes: first-year clinical, humanistic, and economic outcomes. *J Am Pharm Assoc.* 2005;45:130–7.
- 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.
- 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.
- 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.
- National Committee for Quality Assurance. The state of health care quality 2006. Accessed at www.ncqa.org/tabid/447/Default.aspx, December 12, 2007.
- 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.
- National Heart, Lung, and Blood Institute. Detection, evaluation, and treatment of high cholesterol in adults (Adult Treatment Panel III). Accessed at www.nhlbi.nih.gov/guidelines/cholesterol/atp3xsum.pdf December 10, 2007.
- Chobanian AV, Bakris GL, Black HR, et al. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure: the JNC-7 report. *JAMA.* 2003;289:2560–72.
- Partnership To Fight Chronic Disease. A vision for a healthier future: the implications. Accessed at www.fightchronicdisease.org/implications/index.cfm, December 10, 2007.
- Mays GP, Au M, Claxton G. Convergence and dissonance: evolution in private-sector approaches to disease management and care coordination. *Health Aff (Millwood).* 2007;26:1683–91.
- DeVol R, Bedroussian A. An unhealthy America: the economic burden of chronic disease: charting a new course to save lives and increase productivity and economic growth. Santa Monica, Calif.: Milken Institute; 2007.



*Dock on Chesapeake Bay • Maryland's Eastern Shore
August 2007 • Stuart T. Haines, PharmD, FCCP, FASHP*