

## In Brief

This article describes Joslin Diabetes SmartStart, a program through which the provision of educational materials and training to the office staff of primary care providers has resulted in improved clinical and behavioral patient outcomes. Certified diabetes educators provided participating clinics with basic diabetes education for clinical staff; a set of diabetes patient education flipcharts, booklets, and handouts in English and Spanish; and patient access to a call center. Positive outcomes included decreases in hemoglobin A<sub>1c</sub> and blood pressure levels and increases in patient-reported quality of life and confidence in diabetes self-management ability.

# Educating Medical Office Staff: Enhancing Diabetes Care in Primary Care Offices

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Providing education for the 14.6 million people who have been diagnosed with diabetes in the United States is a challenge. Although there are now > 14,000 certified diabetes educators (CDEs), this still is not enough to meet patients' educational needs.

Consider these facts:

- More than 90% of people with diabetes are cared for by their primary care providers (PCPs).<sup>1</sup>
- The American Diabetes Association (ADA) recommends assessing a patient's self-management skills and knowledge of diabetes at least annually and providing or encouraging continuing education.<sup>2</sup>
- One goal of the *Healthy People 2010* report is to increase the percentage of people with diabetes who receive formal diabetes education from 40% in 1998 to 60% by 2010.<sup>3</sup>
- It has been estimated that 50–80% of people with diabetes have significant diabetes knowledge and skills deficits.<sup>4</sup>
- Although at least 15 new medications have been introduced since the Diabetes Control and Complications Trial established the importance of tight glycemic control, average hemoglobin A<sub>1c</sub> (A1C) levels have not shown improvement over time.<sup>5</sup>
- The effectiveness of community health workers or trained peer counselors in providing basic diabetes education, particularly to

underserved populations, has been demonstrated.<sup>6</sup>

- Of the CDEs responding to a large national survey,<sup>7</sup> 67% practice in urban or suburban communities, and 84% are white. This suggests that there may not be adequate distribution of CDEs where they are most needed and that there are not enough CDEs from the ethnic minority groups who also have the largest incidence of diabetes.<sup>7</sup>

A recent environmental scan conducted by the American Association of Diabetes Educators revealed that diabetes education is being carried out in a much wider array of settings and modalities than previously thought.<sup>8</sup> Clearly, if the goal is to reach more people with basic diabetes education messages, then new systems need to be explored and evaluated, specifically systems that do not rely solely on the traditional model of CDEs personally teaching groups or individuals in outpatient settings.

Toward this end, the Joslin Diabetes Center in Boston, Mass., designed and implemented a 2-year pilot project to determine whether using CDEs to train the staff of PCP offices could have a positive impact on patient outcomes and could become an additional option for providing diabetes education. This article describes the program's design and

implementation and reports on outcomes from the first 12 months of the pilot study.

### Overview

Joslin Diabetes SmartStart is an innovative program designed to provide community-based PCPs and their office staff with training and resources to enhance the management of their patients with diabetes. This pilot program was implemented for 2 years in New York City and Detroit, Mich., and reached > 1,600 PCPs and their office staff. The program was designed specifically as an office system approach to improve the management of diabetes. As such, it was considered a quality improvement project. This allowed Joslin staff not only to evaluate the effectiveness of specific elements of the program, but also to continually make minor modifications in the implementation plan over the duration of the project. There was no cost to patients or PCP offices to participate.

### Objectives

The primary objective was to determine whether a program that supplements diabetes resources in the primary care setting could improve clinical and behavioral outcomes related to diabetes.

Other objectives were to identify and measure:

- Provider improvement in aggressively managing diabetes to prevent complications
- Improvements in office staff diabetes knowledge and support of patients with diabetes
- Modifications in office system processes to improve diabetes education
- Improvement in patient health outcomes associated with provider and office staff participation in the program.

### Needs Assessment

A needs assessment survey was completed by 107 PCPs in New York City ( $n = 55$ ) and Detroit ( $n = 52$ ). Only 21% reported doing “very well” in helping patients manage their diabetes. Only 9% felt “extremely” confident that they had adequate resources to effectively educate patients about insulin use, and only 28% stated that they “frequently” referred their patients to a diabetes educator or diabetes education program. Ninety-five percent reported

that they discussed A1C results with their patients at each visit.

Office staff in these same PCP offices also completed a survey ( $n = 521$ ). Respondents’ educational backgrounds were varied. Nineteen percent were registered nurses, 49% were either licensed practical nurses or medical assistants, and 31% were “other,” which included positions ranging from office managers to laboratory technicians to nonlicensed staff members trained for a clinical role. Only 15% felt they were helping patients manage their diabetes “very well,” and only 17% felt “extremely satisfied” with written materials available for diabetes education. Of six diabetes topics, both PCPs and their office staff agreed that nutrition and exercise guidelines were taught least well to patients. Forty-three percent of responding office staff reported that they discussed the A1C test at each patient visit.

Patients enrolled by the PCP practices in both cities were asked if they would like to participate in an evaluation of the program. In a phone survey of patients ( $n = 278$ ) affiliated with the PCP offices, 49% reported having received any type of diabetes education. Forty-seven percent reported feeling “extremely” or “very” confident in their ability to manage their diabetes. Of the non-insulin users responding, 42% reported they were “not at all” willing to take insulin if their doctor recommended it. Sixty-one percent reported that their doctor had ever discussed A1C results with them, and 84% reported that their doctor discussed blood pressure and cholesterol results with them. Of the 255 phone-surveyed patients in New York City, 41% selected Spanish as

the preferred language for educational materials.

These surveys identified major gaps in diabetes education resources and training in the PCP setting. Providers and patients differed in their recall of care and education delivered. Few clinical staff members were nurses, which indicated that most staff members would benefit from additional education targeting their needs. Materials were clearly needed to support teaching about lifestyle change and insulin use, and Spanish-language resources were needed as well.

### Design

Because of the multiple components of the program (Table 1), one could consider this program to be a high-intensity professional education program compared to traditional educational interventions of lower intensity, such as live continuing medical education lectures that attempt to improve physician practice. Joslin staff recognized in the program design stage that the program would need ambassadors to personally recruit and enroll PCPs, develop and maintain relationships with their office staff, provide a core diabetes curriculum to staff, and be available for ongoing educational modules during the 24 months of the project. CDEs were the obvious choice to take this role. Program designers developed a core diabetes curriculum (Table 2) and a set of follow-up modules for the CDEs to use. The CDEs did not, however, provide any direct patient care or teaching.

Practices enrolled in the program received materials and training free of charge (Table 1). The central piece in the kit of diabetes education resources

**Table 1. Program Components**

#### CDEs provide customized diabetes services for staff

- Discuss cases with PCPs and clinical staff members
- Answer questions as needed
- Provide resources based on needs

#### Print materials for PCP offices

- Continuing medical education monograph
- *Joslin’s Diabetes Deskbook*

#### Customized staff training program

- Two-hour core training
- Additional modules on topics as needed

#### Kit for patient education

- Flipchart, booklets, handouts
- Resource manual for staff, including a list of ADA-recognized education programs

## Table 2. Topics Covered in 2-Hour Office Staff Education Programs

- Understanding Diabetes: Challenges and Opportunities
- Monitoring: Why and When
- Food and Exercise: The Foundation
- Diabetes Medications
- Incorporating Education Messages in a Busy Practice

was a versatile and colorful flipchart designed to teach key messages in four topic areas: blood glucose monitoring, risk reduction, eating and activity, and medications. The flipchart was used to train the office staff, who then learned to use the same flipchart to convey key messages to patients. The back of each page of the flipchart included objectives, key messages, and other information for instructors. Office staff learned to use the flipchart to teach a short class (e.g., 15 pages on healthy eating principles), a short topic (e.g., 3 pages on carbohydrate foods), or a single message (e.g., 1 page on label reading).

The education resources kit contained handouts on each of the four topics areas to reinforce the messages from the flipchart. The materials were designed to incorporate principles of patient-directed learning and realistic goal setting and to enhance patient-provider communications.

In addition to training office staff on a core diabetes curriculum, the CDEs also tailored diabetes messages to help office staff take advantage of specific teachable moments during patient encounters. If the role of a staff member was primarily to take blood pressure measurements and record weights, for example, the CDE spent more time on how to reinforce messages related to the importance of blood pressure control and its relation to diabetes.

Messages in the core curriculum regarding insulin included a discussion of myths and misconceptions about starting insulin, basic elements of understanding insulin action, differentiating types of insulin, site rotation, syringe disposal, and options for insulin delivery. The CDEs were prepared to instruct staff members on how to teach patients about injecting insulin, but this was done in subsequent visits rather than as part of the core curriculum and was usually

requested by registered nurses or nurse practitioners who would be doing the actual patient teaching on that topic.

### Launch

Two metropolitan cities were selected to implement the program: New York City and Detroit, Mich. Joslin contracted with a company (Innovex Health Management Services) that specializes in recruiting and managing clinicians who reside within the targeted geographic locations. Two full-time CDEs were hired for Detroit and three CDEs for New York. Each CDE was assigned a territory and was expected to enroll 160 providers within the first 6 months of the program.

The pilot was launched on 1 September 2003. It was extremely important to Joslin that the program be accepted by diabetes specialists in these cities and not perceived as usurping or replacing local ADA-recognized diabetes self-management training programs. A detailed letter explaining the goals and objectives of the program was mailed to every endocrinologist and CDE in each city. This seems to have been quite effective; there was little negative feedback about the program from local diabetes experts.

Program CDEs had an initial 1-week training at Joslin. Clinical and operations staff at Joslin then participated in at least weekly conference calls with the Innovex team who managed the CDEs in the field. Joslin staff also held regular phone meetings with the CDEs and made periodic field visits to both New York and Detroit.

CDEs visited each enrolled practice an average of 15 times. Participating office staff members usually warmly welcomed the CDEs assigned to them once they understood the services they would provide. There was no relationship between CDE visits to practices and visits from pharmaceutical company representatives.

### Participants

PCPs were defined as providers who assumed responsibility for the overall management of patients' diabetes and included physicians, nurse practitioners, and physician assistants in the areas of internal medicine, general practice, or family practice. Once PCPs agreed to enroll, they were asked to identify one clinical office staff member who would serve as the "diabetes champion," i.e., the person

who would assume responsibility for receiving the patient education kit, participate in the core curriculum education, be the point person for communication between the CDE and the practice, and assist with overseeing completion of evaluation and clinical data forms. All other office staff members were invited to participate in the live education programs provided by the CDEs.

During the 1st year of the pilot, the goal was for each participating PCP to enroll 25 patients with diabetes in the program. This required reviewing a consent form with each patient, obtaining a patient signature, and faxing the form to Joslin. The intent of the program design was for all patients who enrolled to receive a series of outbound phone calls from a call center with which Joslin had contracted (McKesson Health Solutions) for the purpose of providing assessment and education related to diabetes. Patients were also provided with a toll-free phone number and invited to call for diabetes-related questions.

Within the first 6 months, 820 PCPs had enrolled, which exceeded the goal of 800. The CDEs provided education seminars for a total of 1,370 office staff during the first 12 months. Patient enrollment proved to be more difficult; only 1,216 patients actually enrolled during the first 12 months. Of these, only 34% were actually reached for an assessment call, and only 12 inbound calls were made by patients. All involved with the program believed that many more patients were actually touched by this program through the efforts of the enrolled providers and their office staff.

CDEs described several barriers to patient enrollment, including the fact that office staff members did not have time to review the detailed consent form with patients and that patients viewed the lengthy forms as a deterrent. The benefit of having access to a call center at no cost did not appear to be an enrollment incentive, nor do we believe it had an impact on our findings. Because of these challenges, the components involving enrolling patients and providing the call center were not continued in the 2nd year of the pilot.

### Evaluation

Program evaluation was carried out on a subset of three groups of partici-

pants: providers, office staff, and patients. Joslin staff identified a cohort of nonparticipating practices in both cities and did a comparison using both PCPs and office staff, which they labeled the “control group.” Survey instruments were specifically developed and designed by a team of diabetes clinical experts and behavioral medicine scientists and therefore are not considered validated instruments. Table 3 provides details of the comparisons carried out.

### Data Collection

Prevaluation data were collected at the time of enrollment and are referred to here as “baseline” measurements. Postevaluation data were collected between 6 and 9 months after enrollment and are referred to as “post.”

PCP metrics, baseline and post, were collected by print and fax surveys. Of the participating PCPs, 171 completed surveys. For comparison, Joslin surveyed 303 nonparticipating PCPs, who were offered a \$25 gift certificate for responding.

Office staff metrics were collected by print surveys distributed by the CDEs. Eighty-three participating office staff members completed surveys. For comparison, Joslin surveyed 65 staff members from nonparticipating offices, who were offered a \$20 gift certificate for responding.

Self-reported patient metrics were collected through a 27-question phone survey of patients who had consented to participate in the program evaluation. Chart audits focused on A1C, blood pressure levels, and diabetes

medications were carried out by participating PCPs who gathered data from the medical records of patients who had consented to participate in program evaluation. A small stipend was given to those PCPs who completed the chart audit forms to compensate for time spent documenting the needed information. Of the 187 patients who participated in the phone surveys, Joslin was able to obtain preprogram clinical chart data on 110 patients and postprogram clinical data on 84 patients. Data were analyzed using a matched pair analysis. There was no control group for patients.

### Methodology

Joslin contracted with an external organization (Outcomes, Inc.) to analyze all data collected during the program. Power calculations were conducted to determine sample sizes necessary for generalizability with 95% confidence. All samples except the provider pre- and postprogram subsets (38 participants, 57% confidence) met this criterion. Data were analyzed using the SAS statistical software program. Student's *t* tests were used to test differences in means, and the Pearson correlation coefficient was used to test for correlations among clinical data sets. *P* values represent differences between the two groups. As in educational and social science research, a 0.05 level of significance was used.

### Outcomes

#### Patient-related

At the time of enrollment in the program, clinical data from a sample of

110 patient medical records showed a mean A1C of 8.1%. During the time of participation in the program, the mean A1C level in the same patient sample (84 with a second A1C measure) decreased to 7.5%, a highly statistically significant difference ( $P = 0.0002$ ). Changes in A1C were significantly correlated with a small improvement in diastolic blood pressure. Another analysis was carried out on the above sample, but with newly diagnosed patients ( $n = 22$ ) removed. The mean A1C decreased from 8.07 to 7.74% ( $P = 0.008$ ), which is still statistically significant.

Improvements in quality of life, as demonstrated by highly significant reductions in feelings of depression and hopelessness, was a main finding of the analysis, based on a matched pair analysis of 187 patient self-reported responses before program implementation compared to their self-reported responses after at least 6 months of program participation (Figure 1). Improvements in diabetes self-management were also noted. Patients demonstrated highly significant improvements in self-reported attitudes, as summarized in Table 4. These included their:

- Confidence in day-to-day abilities to manage their diabetes
- Optimism that what they were doing to control their diabetes would help create a healthier life in the future.
- Satisfaction with what they knew about diabetes.

In addition, baseline and post phone-survey responses showed that these patients were significantly less

**Table 3. Program Evaluation Components**

#### PCPs (written survey)

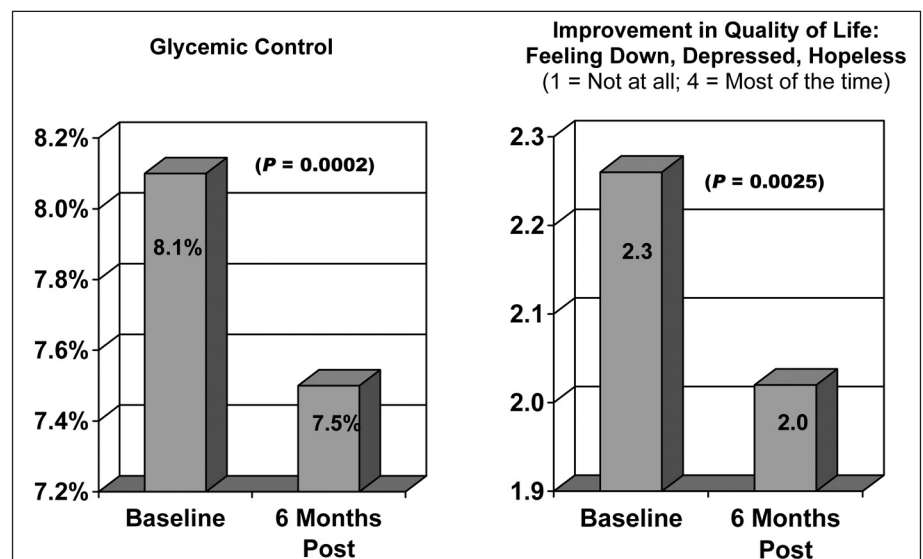
- Attitudes
- Practice patterns
- Satisfaction with program

#### Office staff (written survey)

- Attitudes
- Knowledge
- Usual behaviors
- Satisfaction with program

#### Patients (phone interview and medical record audit)

- Self-management behaviors (self-report)
- Quality of life (self-report)
- Clinical outcomes (A1C, blood pressure, diabetes medications)
- Program evaluation



**Figure 1. Program Impact on Patient Outcomes**

**Table 4. Patient Self-Reported Outcomes\***

Indicator	Pre Mean	Post Mean	P Value
Confidence in ability to manage diabetes	3.39	3.69	< 0.0001
Optimism about a healthy life	3.28	3.60	0.0003
Satisfaction with diabetes knowledge	3.17	3.65	< 0.0001

\*1 = not at all; 5 = extremely.

likely to feel confused about how to manage diabetes or to have unanswered questions about diabetes after participating in the program. Implementation of the program was also associated with an increase in reports of discussion between provider and patient regarding A1C test results. After the program introduction, patients reported statistically significant increases in physician-initiated (+ 13%) and patient-initiated (+ 16%) discussions about A1C test results.

Clinical data from these medical records showed no significant change in diabetes medication management between baseline and postparticipation.

#### Provider-related

Participating providers who responded to the survey reported that they saw an average of 87 total patients per week, 24% of whom had type 2 diabetes. Physician respondents reported that 20% of their patients with type 2 diabetes were managed with insulin.

As summarized in Table 5, participating providers showed a statistically significant change in their satisfaction with the diabetes materials available in their offices ( $P = 0.0001$ ) and their opinion regarding adequate resources available in their practice setting for insulin teaching ( $P = 0.001$ ). The survey did not assess who carried out the diabetes teaching in the office (provider, nurse, or office staff member). Improved provider confidence in their office's ability to provide better educational support to patients with diabetes was documented. These improvements have been demonstrated both among participating providers compared to PCPs in the same cities who did not participate and in the pre- versus postassessment of the participating providers.

#### Office staff-related

Participation in the program significantly and consistently increased office

staff confidence in the ability of the practices to help patients manage their diabetes (on a 5-point Likert scale, the mean increased from 3.31 to 4.43,  $P < 0.0001$ ). These participants were significantly more likely to feel confident in their own ability to help patients manage their diabetes (from 3.27 to 3.80,  $P = 0.0003$ ). Participating providers echoed this result.

Staff members reported that they were also significantly more likely to discuss both A1C ( $P = 0.0005$ ) and cholesterol ( $P = 0.03$ ) test results with their patients with diabetes. Overall satisfaction with the program was demonstrated, with 89% of respondents wanting the program to continue. Survey results showed that the program did not improve the comfort level of the office staff in talking to patients about insulin, but this is not surprising because only 19% were registered nurses, and it was likely not within the roles of other clinical staff members.

#### Outcomes summary

Outcome metrics have demonstrated that during participation in this pilot program, patients experienced an improvement in A1C levels and reported an increase in perceived quality of life. For providers, the program demonstrated increased satisfaction with teaching basic medical

aspects of diabetes in their practice setting. PCP office staff members reported increasing their frequency of discussing A1C test results with patients and an increase in confidence in their ability to help patients manage diabetes. In this experience, Spanish-language patient education materials were highly valued at the New York location.

#### Key Messages

The enormity of the diabetes epidemic necessitates the development of innovative models of providing diabetes education. Although comprehensive diabetes education delivered by CDEs within ADA-recognized education programs may be the gold standard, it is not a realistic expectation that this type of education can reach everyone with diabetes. Even Dr. Elliott Joslin, who began treating diabetes in 1898, realized this when he wrote, "The number of cases is so great . . . that their care must rest in the hands of the general practitioner. It is ridiculous to expect that the treatment of (all) diabetics should be under the supervision of a specialist."<sup>9</sup>

In addition to the measurable outcomes collected as part of the pilot project in the 1st year, CDEs in the field continuously reported that they felt good about the huge need they were filling. In keeping with that philosophy, another Joslin physician, the late Leo P. Krall, MD, once noted, "ideally, the teaching of educators is a simple pyramid, where each level is an immediate contact with the next, with education broadly expanding to the patient."<sup>10</sup>

Because this intervention was not designed as a research study, there are limitations that must be acknowledged when reviewing the results of the project. The multiple survey instruments were designed specifically

**Table 5. Participating Providers' Pre and Post Comparison**

Indicator	Pre Mean	Post Mean	P Value
Satisfaction with diabetes materials available in office	3.10	4.14	< 0.0001
Adequate resources in practice for insulin teaching	3.12	3.88	< 0.0001
Satisfaction with teaching			
• Basic medical aspects of diabetes in office	3.54	3.97	0.0058
• Diabetes and nutrition	3.28	3.83	0.001

\*1 = not at all; 5 = extremely.

for the unique nature of this project and therefore have not been validated. However, because of the close working relationship Joslin had with the project CDEs, it became regular practice for the CDEs to field test new instruments, handouts, or survey tools for a short time before they were finalized.

Another aspect to the program that may be considered a limitation is the variation of training received by each office. It was initially planned that individuals designated to be “diabetes champions” would complete a 4-hour training program. When that proved to be too much for most individuals, the program was modified to be a basic 2-hour core training. In such a limited time frame, topics related to psychosocial issues were minimized. Some office staff received only the core training, whereas others invited the CDEs back to carry out multiple trainings. It has not been analyzed whether practices receiving more in-depth training had better outcomes than those receiving only the minimal interventions.

Diabetes education may be delivered by a variety of team members, including clinical office staff. However, it is crucial that a carefully designed core curriculum be at the center of any program involving non-traditional team members and that CDEs take a leadership role in designing, delivering, evaluating, and making continuous improvements in such programs. In addition, materials such as the flipchart designed for use in PCP offices can help teach and reinforce key survival skill messages.

From this pilot program, Joslin staff learned that there is a huge need for and interest in providing diabetes education resources aimed at both office staff and patients. Office “nurses” are often not registered nurses and often have very little clinical background. However, because they have a face-to-face role with patients, they can influence, reinforce, and even teach some basic messages about diabetes. These individuals have rarely been targeted for diabetes education and yet are willing participants, both in education programs and in diabetes education efforts. Armed with high-quality materials and training, they can augment diabetes education initiated by PCPs, teach survival-level skills, and encourage patients to obtain more advanced training at local diabetes education programs.

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