

Exploring Approaches to Facilitate Diabetes Therapy Intensification in Primary Care

Jodi Krall,¹ Kendra Durdock,² Patricia Johnson,¹ Justin Kanter,¹ Janice Koshinsky,³ Margaret Thearle,¹ and Linda Siminerio⁴

Several landmark studies have provided strong support for the position that vigorous treatment of diabetes in the majority of individuals has the potential to reduce the morbidity and mortality of the disease by decreasing its chronic complications (1,2). In response, many advances have been made that include the introduction of highly successful therapies and tools such as more effective medications, blood glucose meters, insulin delivery systems, and needle sizes. Yet, despite this progress, people with diabetes can still have challenges in meeting target goals (3,4) and experience distress related to their treatment plan (5–7). Intensive therapies that have been shown to prevent or slow the progression of complications require people with diabetes to learn and maintain demanding, complex self-care routines. These therapies and routines are often met with fear and reluctance, and adhering to them can be difficult (5,7,8).

Furthermore, providers report challenges in introducing advanced therapies for people with diabetes. A survey of physicians' attitudes found that primary care providers (PCPs) consider diabetes more difficult to treat than other chronic diseases because it requires more monitoring and medication adjustment to achieve treatment goals (9). Physicians also report that there is inadequate support for the increased time and effort required to treat diabetes patients and that neither clinics nor patients can

afford what it takes for comprehensive care (9–11).

Diabetes self-management education and support (DSME/S) have repeatedly been shown to improve clinical, behavioral, and psychosocial outcomes (12–14). In addition, DSME/S are reported to reduce the onset or advancement of diabetes complications (15), improve quality of life (16,17), enhance self-efficacy and empowerment (18,19), increase healthy coping (20), and decrease the presence of diabetes-related distress (21,22) and depression (23,24). Most recently, DSME/S provided in the primary care setting have been shown to improve processes and patient outcomes (25–27).

To overcome barriers to better diabetes outcomes, new approaches must be explored when introducing therapies into practice. Diabetes educators (DEs) can play a pivotal role in educating and supporting both patients and providers in the adoption and delivery of therapies. Although previous studies have identified barriers to diabetes care, no recent studies have explored insights that offer the potential to directly inform the practice of diabetes education and advancement of diabetes therapies in primary care. Based on provider interviews and patient focus group findings from the first phase of this study (11), the objectives of the subsequent phases (reported here) were 1) to develop and assess the usefulness of an educational program on therapy intensification delivered by DEs

¹University of Pittsburgh Diabetes Institute, Pittsburgh, PA

²Penn State Hershey Medical Group Care Management, Penn State Hershey, Hershey, PA

³University of Pittsburgh Medical Center, Pittsburgh, PA

⁴Department of Medicine, University of Pittsburgh, Pittsburgh, PA

Corresponding author: Jodi Krall, stotts@upmc.edu

DOI: <https://doi.org/10.2337/cd16-0013>

©2017 by the American Diabetes Association. Readers may use this article as long as the work is properly cited, the use is educational and not for profit, and the work is not altered. See <http://creativecommons.org/licenses/by-nc-nd/3.0> for details.

TABLE 1. Diabetes Therapy Intensification: Influencing Factors and Proposed Solutions From Providers and Patients With Type 2 Diabetes

Factors Influencing Diabetes Therapy Intensification Practices	Proposed Solutions
<p>PCPs' and pharmacists' perspectives:</p> <ul style="list-style-type: none"> • Psychological insulin resistance (e.g., needle phobia) • Limited self-knowledge about insulin therapy, devices, and techniques • Lack of prescription specificity (e.g., needle size omitted) • Communication or lack thereof about the progressive nature of diabetes • Inadequate patient education because of time constraints and providers' knowledge gaps • Shortage of in-office staff with diabetes-specific knowledge • Need for more CME programs on diabetes intensification therapies and tools and strategies for introducing them to patients 	<ul style="list-style-type: none"> • Improve providers' and pharmacists' knowledge (e.g., through CME courses) on: <ul style="list-style-type: none"> ○ New therapies and tools ○ Strategies for engaging patients and improving adherence • Implement office-based interventions and education addressing: <ul style="list-style-type: none"> ○ Patient-centered approaches ○ Application of techniques (e.g., motivational interviewing) to encourage patients to initiate and adhere to recommendations ○ Injection demonstrations • Integrate diabetes specialists (e.g., DEs and endocrinologists) into patient care • Develop guidelines or strategies for ensuring that patients are prescribed insurance-approved devices and medications • Provide information on costs to facilitate informed decision-making • Provide on-site demonstrations of injectable medications • Link to resources (e.g., medication assistance programs)
<p>Patients' perspectives:</p> <ul style="list-style-type: none"> • Sense of personal failure • Needle phobia and concerns with pain • Concerns with insulin logistics (e.g., safety, side effects, and complications) • Continuity of care or lack thereof • Cost • Education and demonstration of tools influence willingness to initiate and continue adherence to intensified therapy 	

to primary care staff and 2) to deploy DEs to work directly with primary care practices and their patients when advancing diabetes treatment and to evaluate their experiences.

Methods

This report is based on a multi-phase study that took place in primary care networks in Pittsburgh and Hershey, Pa., between 2013 and 2015. The study was approved by institutional review boards at the University of Pittsburgh and the Pennsylvania State University Hershey Medical Center.

Phase I

The initial phase of this study explored providers' and patients' perspectives on diabetes therapy intensification. Its processes and findings are fully described in a previous report (11). Briefly, provider interview

and patient focus group scripts were developed to capture information on barriers and tools currently available for advancing diabetes therapy, with consideration of education and resources. PCPs ($n = 23$) and three community-based pharmacists participated in telephone interviews; 96 patients with type 2 diabetes, recruited from hospital- and community-based diabetes education programs, primary care practices, a free clinic, and a Federally Qualified Health Center, participated in 1 of 12 focus group discussions (6 with insulin-naïve patients and 6 with insulin users).

Findings from both provider and patient discussions revealed that education is crucial to successful advancement of diabetes therapy, but misconceptions and barriers prevail. Despite the introduction of new

devices, marketing approaches, and continuing medical education (CME) programs, providers and patients reported limited knowledge regarding advanced therapies and opportunities for DSME/S services. Recurring themes emerged from both providers representing a variety of disciplines and patients representing varied races/ethnicities and health care settings. Key messages from interviews and focus groups are summarized in Table 1.

Phase II

Based on findings from Phase I, the study team developed an educational program that included a presentation and handouts to update primary care staff regarding diabetes therapy intensification. The program addressed disease progression, factors influenc-

TABLE 2. Primary Care Practice Staff Members' Evaluation of an Education Program About Advancing Diabetes Therapy (n = 61)

Item	Score (out of 100)
1. This presentation included some information that was new to me.	87
2. I can apply the information presented directly to my patient care.	89
3. The appropriate amount of time was used to deliver this presentation.	91
4. The handouts are useful reference materials.	84
5. I recommend the presentation be repeated for other primary care providers.	95

ing intensification and adherence, current evidence on therapies, innovative approaches to support delivery of advanced therapy (including the benefits of team-based care and DSME/S), and practical tips based on new therapy recommendations. Considerations for cost and methods for assessing and addressing cost barriers were also discussed. Primary care staff were provided with a list of resources to assist patients with accessing diabetes medications and supplies. The presentation was designed to be delivered using either a formal (i.e., PowerPoint presentation) or informal approach, depending on practice-specific factors (e.g., available space and length of time PCPs were available to participate).

PCPs and staff from eight practices were invited to participate in the program, which was delivered at each practice. Community-based DEs were trained in the delivery of the presentation and made themselves available to deliver the program at times that were convenient to the practice. In some cases, DEs delivered the presentation to individual PCPs at a specific time between patient visits; in other cases, practices organized group participation during lunch time. Presentation times ranged from 20 minutes to 1 hour.

After the program, participants (n = 61) completed a brief, five-item evaluation with Likert-scaled response options to assess knowledge gained, appropriateness of content, appropriateness of program length, usefulness of handouts, and whether they would recommend the presentation to other providers. Raw

scores were transformed to a 0–100 scale; higher scores indicated greater satisfaction.

Phase III

To further support delivery of advanced therapy using a team-based model, experienced community-based nurse DEs (n = 4) were deployed for a 1-year period to work directly with four primary care practices whose staff participated in the provider education program (Phase II). The goals of positioning DEs in primary care practices were to improve access to health professionals who are knowledgeable about diabetes, collaborate with providers in therapeutic management, and partner with patients to facilitate informed decisions about advanced therapy through DSME/S. Influencing factors associated with diabetes intensification practices and proposed solutions expressed by patients and providers in Phase I (Table 1) were shared with the DEs, who were encouraged to consider these concerns (e.g., acknowledging fears, addressing cost, understanding the importance of on-site demonstrations, and discussing disease progression) during their interactions with patients and providers. The DEs were trained to partner with practices to proactively identify patients who might benefit from therapy intensification, assist staff in contacting patients to schedule appointments, provide patient-centered, problem-focused DSME/S to patients according to DSME/S standards (28), and collaborate with PCPs to assist patients in meeting recommendations. Subsequently, the educators provided

qualitative feedback regarding their experiences in primary care.

Results

Provider Education Program

A total of 61 primary care practice staff members completed a five-item evaluation after participating in the educational program about diabetes therapy intensification. As shown in Table 2, the program was well received.

Experiences of DEs in Primary Care

The DEs reported on their experiences working with patients and providers within the context of the primary care clinic in relation to proactive patient identification, interactions with patients, and collaborating with providers. They reported challenges in reaching and engaging patients who were identified by practices as eligible candidates for therapy intensification. Many patients did not respond to contacts (e.g., letters and phone calls) made by either the practice staff or the DEs directly. Some patients responded but declined to make an appointment with a DE; the primary reason given was that they did not see the value because they had previously received some form of diabetes education.

For those patients who presented for DSME/S, the DEs reported that most seemed receptive to engaging in the visit. Engagement seemed particularly high when patients had a specific skill to learn or issue to discuss or when they realized that the visit was patient-centered and problem-focused. All of the DEs reported discussing therapy intensi-

fication with patients and identified motivational interviewing as a useful technique for facilitating discussion. Many patients who started insulin verbalized increased confidence in their ability to administer an injection by working collaboratively with a DE. Some barriers to intensification were reported; in particular, the DE working with a practice in an underserved area found that lack of insurance and the costs of insulin and associated devices were issues.

The DEs also developed processes with the primary care practices to enhance a team approach and support therapy intensification. For example, one DE reported that, based on her assessment after each DSME/S encounter, she routed individualized recommendations to the patient's PCP to be co-signed. The PCP would then sign the encounter in agreement or send back his or her recommendations. One provider (on his own) set up a specific time and day with his patients to call the DE with blood glucose updates during intensification. The DEs also reported collaborating with practice-based registered dietitians (RDs), who often had referrals for the same patients and would share information.

DEs perceived provider receptivity to working with them to have evolved over the course of the study. At the onset, DEs generally felt that providers were not reliant on them and seemed reluctant to accept their recommendations regarding therapy intensification. However, as patients' adherence and willingness to initiate and intensify insulin therapy were observed to improve over the course of the partnership, so too did collaborations with and support from providers. One DE reported that the providers she worked with began to seek her out for treatment recommendations and advice on ways to approach patients about adherence, as well as frequently asked for resources regarding financial assistance for devices and programs. Another DE reported that, over time, PCPs fre-

quently asked about medication therapy (e.g., when to initiate insulin or add another new medication) and sought general information on newer drug classes. Such questions were often general and not specific to particular patients. Beyond PCPs, DEs also developed relationships with the clinics' nursing staff and noticed that nurses began encouraging providers to refer patients for DSME/S.

Discussion

Both providers and patients reportedly agree that education is essential in promoting understanding, acceptance, and adherence to advanced diabetes therapy (11), yet findings from this phase of the study suggest that, although providers are willing to participate in an educational program to advance their knowledge of diabetes therapies, more efforts are needed to get patients to better understand and appreciate the benefits of DSME/S.

The provider educational program specifically designed to address barriers related to diabetes therapy intensification and delivered by DEs within the practices was well received. Primary care staff members were satisfied with the information, handouts, and time devoted to the educational presentation. A large majority of attendees reported that they had learned something new and thought the program should be repeated for other PCPs.

Unfortunately, DEs assigned to deliver DSME/S in primary care practices met challenges with regard to patient participation. They attempted to address access issues, previously reported as a barrier to participation (29), by proactively identifying and reaching out to patients (via letters and follow-up phone calls) and delivering education within the familiar community-based practice setting. Despite these efforts, many patients failed to engage. Some who declined to participate cited that they did not need additional education. This reaffirmed the notion that the value of education must be communicated

throughout the course of treatment, on every front, and considered as a quality measure (30).

Patients who did meet with a DE, however, were receptive and expressed increased confidence in their self-care skills after receiving DSME/S. DEs found that, when inviting patients to participate, those who identified a specific skill or personal need that required attention were more likely to partake in a DSME/S visit. For example, when a patient required an injection demonstration or expressed a fear of hypoglycemia or weight gain, the DEs found this to be an entry to patient engagement in DSME/S. Thus, DEs may want to consider using a patient-centered strategy by asking, "What troubles you with your diabetes?" when attempts are made to engage especially reluctant patients to participate in DSME/S (31).

Studies of team-based care have shown promising results when a variety of health care disciplines play an active role in therapeutic management (32–34). During the course of this study, PCPs increasingly relied on DEs to make therapeutic recommendations after the DEs' expertise became apparent. DEs deployed to the practices found that, over time, they gained the respect and trust of the PCPs and became actively involved in making therapy recommendations. DEs also reported a strengthened partnership with RDs when collaborating on patient treatment plans.

Using DEs familiar to the practices also afforded the practice team access for additional medical education. DEs found that being integrated into primary care practices offered them opportunities to present current treatment, self-management, and behavioral approaches to PCPs to promote improved patient outcomes along with facilitating patients' willingness to accept and adhere to advanced therapy. The current climate of reluctance on the part of medical practices to engage with pharmaceutical and device industry

sales representatives and the finding that PCPs place a high priority on continuing education, underscore the importance of exploring opportunities to provide DEs with access to primary care practices and practitioners. In addition to opening opportunities for therapeutic management and staff education, building confidence in DEs as trusted team members offers the potential for increased referrals to DSME/S services. DEs found that working within the primary care practices also led to enhanced relationships with office staff members, who began identifying patients experiencing management challenges and encouraging providers to refer these patients for DSME/S.

Every effort to improve referral and patient participation in DSME/S must be made, given recent reports showing that only 6.8% of insured adults with newly diagnosed diabetes (35) and only 4% of Medicare participants receive DSME/S (36). Although physician referral has been positively associated with patient participation (37), physicians report a lack of clear guidance on when to refer patients for DSME/S. In response, a recent position statement jointly issued by the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics (31) acknowledged the need for systematic referral processes to promote uptake of DSME/S services. To this end, an evidence-based diabetes education algorithm was developed to provide guidance on when, what, and how DSME/S should be provided for adults with type 2 diabetes. As might be expected, DSME/S are recommended when factors present that may influence self-management, including the introduction of new medications such as insulin.

Study Limitations

Several limitations should be considered when interpreting these findings. Although practices included

in this study represented offices of varying sizes, geographical locations (e.g., urban, rural, or suburban), and patient panels, a convenience sample may not be representative of the entire study population, and results may not be generalizable to other population groups. In addition, although qualitative feedback from DEs provided insight into their experiences in promoting advanced therapy in primary care practices, the study design limited the ability to more fully evaluate the influence of the DEs on provider practices and patient outcomes. Further evaluation through a randomized controlled study design is underway.

As the number of people with diabetes who will require support to adequately self-manage a complex treatment regimen increases, it is crucial that innovative care delivery models be implemented and evaluated to address these challenges.

Acknowledgments

The authors thank Drs. Robert Gabbay, William Curry, and Francis X. Solano for their collaboration on this study. They also thank the University of Pittsburgh Qualitative, Evaluation, and Stakeholder Engagement Services for providing guidance on qualitative research design and analysis. In addition, they thank the PCPs, patients, and practice staff members who participated in the study.

Funding

This article represents independent research supported by a grant from Becton, Dickinson and Company.

Duality of Interest

No potential conflicts of interest relevant to this article were reported.

References

1. DCCT Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. *N Engl J Med* 1993;329:977–986
2. U.K. Prospective Diabetes Study Group. Tight blood pressure control and risk of macrovascular and microvascular complications in type 2 diabetes: UKPDS 38. *BMJ* 1998;317:703–713
3. Khunti K, Wolden ML, Thorsted BL, Andersen M, Davies MJ. Clinical inertia in

people with type 2 diabetes: a retrospective cohort study of more than 80,000 people. *Diabetes Care* 2013;36:3411–3417

4. Grant RW, Buse JB, Meigs JB; University HealthSystem Consortium (UHC) Diabetes Benchmarking Project Team. Quality of diabetes care in U.S. academic medical centers: low rates of medical regimen change. *Diabetes Care* 2005;28:337–342

5. Peyrot M, Rubin RR, Lauritzen T, et al.; International DAWN Advisory Panel. Resistance to insulin therapy among patients and providers: results of the cross-sectional Diabetes Attitudes, Wishes, and Needs (DAWN) study. *Diabetes Care* 2005;28:2673–2679

6. Skovlund SE, Peyrot M. The Diabetes Attitudes, Wishes and Needs (DAWN) program: a new approach to improving outcomes of diabetes care. *Diabetes Spectrum* 2005;18:136–142

7. Fisher L, Hessler DM, Polonsky WH, Mullan J. When is diabetes distress clinically meaningful? Establishing cut points for the Diabetes Distress Scale. *Diabetes Care* 2012;35:259–264

8. Rubin RR. Adherence to pharmacologic therapy in patients with type 2 diabetes mellitus. *Am J Med* 2005(Suppl. 5A);118:27S–34S

9. Anderson RM, Fitzgerald JT, Gorenflo DW, Oh MS. A comparison of the diabetes-related attitudes of health care professionals and patients. *Patient Educ Couns* 1993;21:41–50

10. Rubin RR, Peyrot M, Kruger DF, Travis LB. Barriers to insulin injection therapy: patient and health care provider perspectives. *Diabetes Educ* 2009;35:1014–1022

11. Krall J, Gabbay R, Zickmund S, Hamm ME, Williams KR, Siminerio L. Current perspectives on psychological insulin resistance: primary care provider and patient views. *Diabetes Technol Ther* 2015;17:268–274

12. Gary TL, Genkinger JM, Guallar E, Peyrot M, Brancati FL. Meta-analysis of randomized educational and behavioral interventions in type 2 diabetes. *Diabetes Educ* 2003;29:488–501

13. Norris SL, Lau J, Smith SJ, Schmid CH, Engelgau MM. Self-management education for adults with type 2 diabetes: a meta-analysis of the effect on glycemic control. *Diabetes Care* 2002;25:1159–1171

14. Siminerio L, Ruppert KM, Gabbay RA. Who can provide diabetes self-management support in primary care? Findings from a randomized controlled trial. *Diabetes Educ* 2013;39:705–713

15. Stratton IM, Adler AI, Neil HA, et al. Association of glycaemia with macrovascular and microvascular complications of type 2 diabetes (UKPDS 35): prospective observational study. *BMJ* 2000;321:405–412

16. Cooke D, Bond R, Lawton J, et al.; U.K. NIHR DAFNE Study Group. Structured

- type 1 diabetes education delivered within routine care: impact on glycemic control and diabetes-specific quality of life. *Diabetes Care* 2013;36:270–272
17. Cochran J, Conn VS. Meta-analysis of quality of life outcomes following diabetes self-management training. *Diabetes Educ* 2008;34:815–823
18. Funnell MJ, Anderson RM. Empowerment and self-management of diabetes. *Clin Diabetes* 2004;22:123–127
19. Tang TS, Funnell MM, Oh M. Lasting effects of a 2-year diabetes self-management support intervention: outcomes at 1-year follow up. *Prev Chronic Dis* 2012;9:E109
20. Thorpe CT, Fahey LE, Johnson H, Deshpande M, Thorpe JM, Fisher EB. Facilitating healthy coping in patients with diabetes: a systematic review. *Diabetes Educ* 2013;39:33–52
21. Siminerio L, Ruppert K, Huber K, Toledo FG. Telemedicine for Reach, Education, Access and Treatment (TREAT): linking telemedicine with diabetes self-management education to improve care in rural communities. *Diabetes Educ* 2014;40:797–805
22. Fisher L, Hessler D, Glasgow RE, et al. REDEEM: a pragmatic trial to reduce diabetes distress. *Diabetes Care* 2013;36:2551–2558
23. de Groot M, Doyle T, Kushnick M, et al. Can lifestyle interventions do more than reduce diabetes risk? Treating depression in adults with type 2 diabetes with exercise and cognitive behavioral therapy. *Curr Diab Rep* 2012;12:157–166
24. Hermanns N, Schmitt A, Gahr A, et al. The effect of a Diabetes-Specific Cognitive Behavioral Treatment Program (DIAMOS) for patients with diabetes and subclinical depression: results of a randomized controlled trial. *Diabetes Care* 2015;38:551–560
25. Piatt GA, Orchard TJ, Emerson S, et al. Translating the Chronic Care Model into the community: a randomized controlled trial of a multifaceted diabetes education intervention. *Diabetes Care* 2006;29:811–817
26. Siminerio LM, Ruppert K, Emerson S, Solano FX, Piatt GA. Delivering diabetes self-management education (DSME) in primary care. *Disease Management & Health Outcomes* 2008;16:267–272
27. Wagner EH, Bennett SM, Austin BT, Greene SM, Schaefer JK, Vonkorff M. Finding common ground: patient-centeredness and evidence-based chronic illness care. *J Altern Complement Med* 2005;11(Suppl. 1):S7–S15
28. Haas L, Maryniuk M, Beck J, et al.; 2012 Standards Revision Task Force. National standards for diabetes self-management education and support. *Diabetes Care* 2012;35:2393–2401
29. Siminerio LM, Piatt G, Zgibor JC. Implementing the Chronic Care Model for improvements in diabetes care and education in a rural primary care practice. *Diabetes Educ* 2005;31:225–234
30. Ruppert K, Uhler A, Siminerio L. Examining patient risk factors, co-morbid conditions, participation, and physician referrals to a rural diabetes self-management education program. *Diabetes Educ* 2010;36:603–612
31. Powers MA, Bardsley J, Cypress M, et al. Diabetes self-management education and support in type 2 diabetes: a joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. *Diabetes Care* 2015;38:1372–1382
32. Siminerio LM, Funnell MM, Peyrot M, Rubin RR. US nurses' perceptions of their role in diabetes care: results of the cross-national Diabetes, Attitudes, Wishes and Needs (DAWN) study. *Diabetes Educ* 2007;33:152–162
33. Shojania KG, Ranji SR, McDonald KM, et al. Effects of quality improvement strategies for type 2 diabetes on glycemic control: a meta-regression analysis. *JAMA* 2006;296:427–440
34. Pringle JL, Boyer A, Conklin MH, McCullough JW, Aldridge A. The Pennsylvania Project: pharmacist intervention improved medication adherence and reduced health care costs. *Health Aff* 2014;33:1444–1452
35. Li R, Shrestha SS, Lipman R, Burrows NR, Kolb LE, Rutledge S; Centers for Disease Control and Prevention (CDC). Diabetes self-management education and training among privately insured persons with newly diagnosed diabetes—United States, 2011–2012. *MMWR Morb Mortal Wkly Rep* 2014;63:1045–1049
36. Duncan I, Ahmed T, Li QE, et al. Assessing the value of the diabetes educator. *Diabetes Educ* 2011;37:638–657
37. Rubin RR, Peyrot M. Factors affecting use of insulin pens by patients with type 2 diabetes. *Diabetes Care* 2008;31:430–432