Manhattan Veterans Affairs Medical Center Diabetes Prevention Clinic

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Quality Improvement Success Stories are published by the American Diabetes Association in collaboration with the American College of Physicians, Inc., and the National Diabetes Education Program. This series is intended to highlight best practices and strategies from programs and clinics that have successfully improved the quality of care for people with diabetes or related conditions. Each article in the series is reviewed and follows a standard format developed by the editors of *Clinical Diabetes*. The following article describes the establishment of a Diabetes Prevention Clinic for veterans with prediabetes.

Describe your practice setting and location.

The Manhattan Veterans Affairs (VA) Medical Center is a major teaching affiliate of the New York University (NYU) School of Medicine serving the veteran population in greater New York City.

Describe the specific quality gap addressed through the initiative.

Prediabetes and diabetes are more than twice as prevalent in veterans as in the general population. Data from the National Health and Nutrition Examination Survey revealed a 20.5% prevalence of diabetes among veterans in the 2013–2014 period (1). To mitigate the high diabetes prevalence in veterans, the U.S. Department of Veterans Affairs has established two evidence-based programs: MOVE! and the VA Diabetes Prevention Program (VA-DPP).

MOVE! is a comprehensive weight management program that includes eight to ten small group sessions in 3 months, followed by monthly maintenance sessions. The program is led by a multidisciplinary team comprising nutritionists, health psychologists, and physical therapists, and its goal is to achieve weight loss and a healthy lifestyle in overweight or obese veterans, although it does not explicitly target veterans with prediabetes. Alternatively, the VA-DPP, a Centers for Disease Control and Prevention (CDC)-recognized lifestyle change program, includes 22 group-based intensive lifestyle change sessions and targets veterans with prediabetes.

A comparative effectiveness trial of these group-based lifestyle interventions showed no difference in A1C between the two groups. There were higher rates of participation and individual-level maintenance of weight loss at 12 months in the VA-DPP cohort. Although higher than in the MOVE! Group, the still relatively low participation rate in the VA-DPP was likely related to participants being older, having lower socioeconomic status, and being more burdened by multiple chronic conditions than the general population (2).

Given the heterogeneous population of veterans, a one-size-fits-all strategy employing only group sessions, although effective for some participants, may not be suitable for all. The Diabetes Prevention Clinic (DPC) at the Manhattan VA Medical Center was therefore initiated in 2016 as an innovative program to identify and intervene with veterans with prediabetes, defined as having an A1C of 5.7–6.4%. A figure outlining the development of the DPC is provided (Supplementary Materials).

The DPC focuses on increasing intervention in veterans with prediabetes who are not participating in any weight loss or diabetes prevention program, with the goal of A1C reduction. The clinic differs from the VA-DPP and MOVE! Programs because veterans are seen individually rather than in group sessions and are managed by a physician.

Some people may prefer personal, face-to-face interaction with a physician over lengthy, formal, structured group learning programs. This preference can be problematic because primary care providers (PCPs) may have limited time to counsel patients and focus on prediabetes education during routine visits, especially if patients have multiple comorbidities. As a result of these time limitations, intervening in prediabetes may not be prioritized. The DPC provides customized, flexible, and individualized treatment for prediabetes, focusing on lifestyle modifications such as adopting healthy eating habits, getting adequate exercise, and losing excess weight. Personalized visits with a physician may be a cost-effective approach to diabetes prevention given that more structured programs require coaches, tools, and frequent meetings.

This report summarizes the highly encouraging results from a pilot study of the DPC, which strongly suggest that an individualized intervention may be an effective alternative intervention for diabetes prevention.

How did you identify this quality gap? In other words, where did you get your baseline data?

We identified the quality gap from a chart audit identifying >500 veterans receiving current clinical care at the Manhattan VA who had had an A1C of 5.7–6.4% in the past 5 years but who did not participate in MOVE! or the VA-DPP.

These individuals received letters inviting them to attend the DPC (Supplementary Materials). Other recruitment methods included placing copies of a flyer containing a prediabetes screening questionnaire in waiting areas such as at the facility pharmacy, radiology department, and clinical laboratory (Supplementary Materials). Individuals who screened as high risk were encouraged to make an appointment in the DPC. A phone number to call for an appointment was provided on both the letter and the flyer. A formal lecture on prediabetes and diabetes prevention was also delivered to PCPs on several occasions to enhance their understanding of the importance of intervention in prediabetes, encourage referrals to the DPC, and answer PCP questions (Supplementary Materials). Additionally, a few veterans

heard about the clinic via word of mouth and were able to self-refer by making an appointment for the DPC with the support staff.

Summarize the initial data for your practice (before the improvement initiative).

From February to September 2016, 66 patients visited the DPC. A baseline A1C was ordered for each at the first clinic visit. Of the 66 patients, 34 patients had a baseline A1C of 5.7–6.4% and completed at least one follow-up visit between 3 and 6 months. A total of 32 subjects were excluded: 16 (24%) had no follow-up, 14 (21%) had a baseline A1C <5.7%, and 2 (3%) had a baseline A1C >6.4%. Although the no-show rate for subspecialty clinics at the Manhattan VA has improved substantially, it approximated 20–25% when the DPC was instituted because of administrative and patient-related factors. The number of subjects who were referred through flyers was not recorded. Most patients attending the DPC were recruited through mailings, whereas others found out about the program from flyers, through word of mouth, or via referral from their PCP.

The DPC was managed by an endocrinologist and an internist who worked closely together. Subjects were randomly assigned to see either physician. Follow-up visits were scheduled between 3 and 6 months after the initial clinic appointment. At each visit, the PCP took a medical history, extensively reviewed diet and exercise, recorded the patient's BMI, and ordered an A1C and oral glucose tolerance test (OGTT). Patients received extensive verbal instructions regarding the importance of addressing prediabetes through personalized lifestyle modifications and were referred to a nutritionist for more intensive dietary counseling. Formal education materials were not routinely offered, but the PCP did direct patients to helpful apps (e.g., CalorieKing) and provided listings of preferred foods individually after a detailed nutritional inventory was completed. The objective was to personalize lifestyle recommendations based on patients' background, degree of insight, personal and family history, and economic circumstances. Patients were asked to visit with a nutritionist at least once, which they could do, if they wished, on the same afternoon they attended the DPC.

Baseline data for the 66 patients included in the pilot study were as follows. There were 33 men (97%) and 1 woman (2.9%) among the participants. Additionally, 15 (44%) were black, 13 (38.2%) were Caucasian, 1 (2.9%) was Asian, and 5 (14.7%) were of an unknown racial group. The baseline average age was 65.4 ± 5.4 years, mean BMI was 29.8 ± 5.5 kg/m^2, and mean A1C was $5.98 \pm 0.17\%$.

What was the time frame from initiation of your quality improvement (QI) initiative to its completion?

A retrospective analysis was performed up to 6 months after the initial clinic visits, which occurred between February and September 2016.

Describe your core QI team. Who served as project leader, and why was this person selected? Who else served on the team?

The senior physician serving as project leader of the DPC is an endocrinologist and chief of the endocrinology division at the Manhattan VA who has considerable clinical and organizational experience and a commitment to innovative research and programming in diabetes prevention. The launch of this initiative succeeded in part because of support from the Chief of Medicine at the Manhattan VA and the Chief of the Endocrinology division at NYU School of Medicine. A physician with expertise in clinical informatics was essential in identifying patients with prediabetes from a computerized chart review process.

Physicians from the primary care division, a diabetes nurse practitioner, a diabetes nurse educator, and nutritionists were instrumental in planning, organizing, and launching the DPC. The diabetes nurse practitioner, diabetes nurse educator, and nutritionists coordinated referral of patients for nutritional counseling after DPC visits.

Overall, the DPC was a collaborative effort involving the endocrinologist and internist, a diabetes nurse practitioner, and nursing, nutrition, and administrative personnel.

Describe the *structural* changes you made to your practice through this initiative.

PCPs had the option to refer patients to the DPC through the electronic medical record (EMR) system, and patients now had the opportunity to focus on diabetes prevention in a full clinic visit. Also, high-risk patients identified by the prediabetes screening questionnaire could self-refer to the DPC. Clinical space and support staff were allocated for this initiative.

Describe the most important changes you made to your *process* of care delivery.

Assistance from staff with computer programming expertise was crucial for adding a DPC consultation option and clinic to the EMR and developing the OGTT order set. We also created a DPC clinic note template that was used during clinic visits (Supplementary Materials).

The flyers that contained a prediabetes screening questionnaire adapted from the CDC National DPP were distributed in the waiting rooms and served as patient education material. Patients were able to self-refer or call a diabetes nurse practitioner, diabetes nurse educator, or their PCP to discuss the results of their prediabetes screening to see if an appointment with the DPC was warranted.

In the DPC, patients were counseled about personalized lifestyle modifications and referred to a dietitian for further dietary counseling. The latter was not mandatory but was highly encouraged for at least one session. The goal was to reduce patients' weight and lower their A1C.

Physicians obtained medical, dietary, and exercise histories; provided education concerning the implications of prediabetes; and offered extensive advice on lifestyle modification. Discussion with patients involved a practical rather than a formal approach. The approach was geared to patients' insights and amenability to proposed therapeutic recommendations. For example, if a patient was not willing to leave home to exercise, home exercise was recommended. Furthermore, if a patient could not prepare a meal at home and preferred ordering from restaurants, the focus was on healthy menu selections and those that should be avoided.

Baseline A1C measurement and an OGTT were ordered at the first DPC visit. Both were ordered because A1C, although a standard screening tool for diabetes, is insensitive for detecting dysglycemia in certain conditions such as iron deficiency anemia and severe hypertriglyceridemia and in the presence of hemoglobin variants. A1C levels may also be affected by a patient's ethnicity or age.

The OGTT allows for a more detailed characterization of dysglycemia. It can identify individuals with isolated impaired glucose tolerance (IGT) who are at increased risk for diabetes and cardiovascular disease (CVD). In individuals with impaired fasting glucose, the additional presence of IGT further increases the risk for both diabetes and CVD. Furthermore, performing an OGTT was important because patients could have an A1C in the prediabetes range but glucose levels during the OGTT that are within the diabetes range.

Higher-risk individuals could be treated with metformin if lifestyle modification was not sufficiently effective in reducing A1C or if A1C increased significantly.

Summarize your final outcome data (at the end of the improvement initiative) and how it compared with your baseline data.

The analysis demonstrated a statistically significant reduction in mean A1C from 6.0 to 5.8% (-0.2 ± 0.35,

P <0.001) in the 34 patients completing the DPC's 6-month follow-up. Specifically, A1C decreased in 70.6% (*n* = 24) of patients who followed up, with the highest reductions of 1.0–1.4% occurring in 11.8% (*n* = 4). Another 11.8% (*n* = 4) of patients who followed up had no change in A1C, and 17.6% (*n* = 6) had an increased A1C, with the largest increase occurring in one patient whose A1C rose by 0.6%.

An overall mean weight reduction from 92.1 ± 19.1 to 90.9 ± 18.2 kg (−1.2 ± 3.4 kg, *P* = 0.038) occurred in 33 patients. One patient was excluded because weight data were not available. Weight loss of ≥1.0 kg was observed in ~48.5% of patients (*n* = 16), weight change between −1.0 and +1.0 kg occurred in 30.3% (*n* = 10), and weight gain of ≥1 kg occurred in 21.2% (*n* = 7). The greatest weight loss ranged from 5.9 to 6.4 kg in 18.2% of patients (*n* = 6). Of the seven patients with weight gain, three gained 1.1–1.2 kg, three gained 3.4–4.4 kg, and one gained 8.6 kg. All 34 patients visited a nutritionist.

It is unclear why some patients had reductions in A1C and weight whereas others experienced increases. Those with weight reduction were highly motivated and readily implemented lifestyle modifications with regard to diet and exercise. Some patients experiencing increases in A1C and weight may have had difficulty making lifestyle modifications because of their home environment and stressors, mental health issues, socioeconomic factors, or comorbidities. Future studies are needed to understand what barriers prevent weight and A1C reductions in patients with prediabetes, particularly those in the veteran population.

In summary, our findings suggest that individualized visits with an experienced physician and health care team focusing exclusively on prediabetes intervention may be an effective approach for diabetes prevention.

What are your next steps?

There are limitations to this pilot study. The sample size was small, and the time frame was too short to draw definitive conclusions. Recruitment and retention can be a problem, as in other diabetes prevention programs. However, we have shown in this exploratory initiative that patients may be motivated to attend the DPC if they prefer informal, individualized diabetes prevention counseling rather than extensive, group-based, structured programs. Thus, offering a menu of program options may be essential to extend opportunities for diabetes prevention.

Clearly, data from larger studies of programs similar to the DPC are required. In this regard, consideration is being given to expanding the DPC to other VA sites, which would permit the development of a substantial database and could provide long-term confirmation of these preliminary results. If data from further investigations support the initial findings, this result could support offering a flexible, customized option for diabetes prevention to patients who may prefer such a program.

What lessons did you learn through your QI process that you would like to share with others?

It is essential to identify and obtain support from key stakeholders in developing any program. These stakeholders must be involved in all important aspects of program development and participate in decision-making. Flexibility and creativity are also crucial, as is a willingness to modify tactics and strategies based on experience and ongoing feedback.

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