INNOVATION AND IMPROVEMENT

Frontline Account: Resident-led Implementation of the National Diabetes Prevention Program within Primary Care Clinics of a Large, Academic Medical Center

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J Gen Intern Med 31(5):573–5

DOI: 10.1007/s11606-016-3613-6

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BACKGROUND

I glanced at my clinic schedule and sighed when I saw my first patient's chief complaint: "abnormal labs." As I entered the room, Mr. P handed me a slip of paper, simultaneously declaring, "I have borderline diabetes." Recent screening at an employee health fair showed his fasting blood sugar was 122 mg/dL, and he was advised to follow up with his primary care physician for further management.

Mr. P is one of an approximate 86 million U.S. adults with prediabetes, an asymptomatic condition that portends an increased risk of developing type 2 diabetes. Despite the high prevalence of prediabetes, the Centers for Disease Control and Prevention (CDC) estimate that 90 % of prediabetic individuals are not aware that they have the condition. This is an undeniable public health threat, as 5–10 % of these individuals, if untreated, will progress annually to diabetes.¹

Fortunately, it is possible to prevent or delay the onset of diabetes by identifying at-risk individuals and engaging them in evidence-based interventions. The landmark Diabetes Prevention Program Trial showed a reduction in the 3-year incidence of diabetes with either modest behavior change or metformin compared to placebo.² Specifically, 7 % body weight loss and increased physical activity led to a 58 % reduction in diabetes while treatment with metformin resulted in a 31 % decrease in disease incidence.

These results have generated nationwide efforts to translate dietary and physical activity interventions into clinical practice. The CDC designed the National Diabetes Prevention Program (NDPP), a 22-week, group-based adaptation of the trial's lifestyle interventions.

Trained coaches deliver education on diet and exercise and record participant weights and physical activity minutes. While the program has been successfully administered in a variety of clinical and community settings,³ the YMCA, in partnership with UnitedHealth Group, has led one of the most extensive implementation initiatives. During a 2-year period, more than 1700 individuals completed the YMCA's program and achieved an average weight loss of 5 %, showing that program can be both effective and scalable in a real-world setting.⁴

Prior to his clinic visit, Mr. P had read about the YMCA's diabetes prevention program, and he thought the weekly weigh-ins, dietary coaching, and exercise logs might help him to lose weight. "My doctor has been telling me I need to lose weight," he stated, "but it's been hard." He noted that work-related demands often hindered his plans to start exercising and, despite several referrals to a dietician, he never scheduled a visit because "I know what I need to do." He asked me if I knew other patients who had participated in the YMCA's diabetes prevention program; I said that I did not.

Within the internal medicine residency program of our large academic medical center, we were two of only a handful of trainees who intended to pursue careers in primary care. We also shared a specific interest in helping our patients to prevent diabetes and acknowledged the limitations of the behavioral change counseling that we often delivered during time-crunched office visits. How could we more effectively alter the clinical trajectory for our patients with prediabetes?

Mr. P's inquiry about the YMCA's program prompted us to investigate diabetes prevention resources in our area, and we learned that several community organizations offered the NDPP. Despite the availability of local diabetes prevention programs, we seldom referred patients to these resources. Rather, we frequently tasked patients with vague recommendations—"eat less," "exercise more"—or encouraged individuals to meet

with the clinic's dietician. This anecdotal observation is congruent with literature suggesting that only 5 % of prediabetic individuals are referred to health education, wellness, or lifestyle programs.⁵

Through discussion with our clinic preceptors and co-residents, we discovered that many clinicians were unaware of the NDPP and available community programs. Other physicians were aware of the NDPP, but rarely referred patients to participate, given the approximate out-of-pocket expense of \$500 per participant per year. We speculated that offering the NDPP as a free clinical program within our continuity clinic might increase clinician awareness of the program, reduce financial barriers to patient participation, and improve patient care.

PILOTING THE NDPP WITHIN A RESIDENT CONTINUITY CLINIC

With encouragement from our faculty preceptors, residency program leadership and the clinic medical director, we started the NDPP at our resident continuity clinic in the Fall of 2013. We applied for and received a small pilot grant through our institution's "Fostering Innovation Grant" program, which covered the cost of course materials, pedometers, and a calorie-counting guide.

We quickly appreciated the logistical complexity of administering this year-long program and so we looked to experienced, community-based programs for guidance and potential collaboration. The National Kidney Foundation of Michigan (NKFM) offers the NDPP in communities throughout southern Michigan and they recently earned CDC recognition as an effective diabetes prevention site. NKFM shared our perspective that a partnered approach was vital to large-scale diabetes prevention, and they were eager to help us with our pilot program. They generously provided us with an experienced lifestyle coach free-of-charge.

We recruited non-diabetic adults with a BMI ≥ 25 kg/m² and laboratory evidence of prediabetes from our clinic site using two strategies: physician referral and resident-performed chart review. We sent a total of 100 invitation letters; 20 patients, including Mr. P, enrolled in the program. Our lifestyle coach delivered the weekly sessions in the clinic's conference room. Two medical students recorded weekly weights and physical activity minutes.

Mr. P embraced the program's objectives and lost 24 lbs over 12 months. In an e-mail to the lifestyle coach,

he wrote: "The Diabetes Prevention Program has taught me that I can and do have the power and the means to change my health. The information we were given, and the knowledge we now have, will stay with us for the rest of our lives."

Mr. P's success was not an anomaly among our group participants. Eighteen of the initial 20 group participants attended at least nine of the 16 weekly sessions, and were thus considered program-completers by CDC standards. At 16 weeks, program participants lost an average of 4 % body weight. Importantly, this was maintained at 22 weeks, and is consistent with outcomes achieved nationally.³ The average baseline hemoglobin A1c was 5.9 % and remained stable at week 22 in the 50 % of participants for whom we had data.

EXPANDING THE NDPP WITHIN AN ACADEMIC MEDICAL CENTER

Given the relative success of our pilot program, we hoped to expand the NDPP to other University Michigan Health System (UMHS) primary care sites. We quickly discovered that, as residents, we could not autonomously implement a project of such scale within our complex health system. In attempts to gain program support and develop collaborative partnerships within our institution, we worked with the leadership for primary care and nutrition services. We also worked with the Adult Diabetes Education team within the Division of Metabolism, Endocrinology and Diabetes (MEND). One of the MEND team's dietitians completed the CDC Master trainer program for the NDPP, and, during the subsequent year and a half, ran three diabetes prevention programs within our primary care clinics.

Adult Diabetes Education's commitment to NDPP development helped transform our resident-led pilot initiative into a credible program with foreseeable longevity. Their existing infrastructure and experience with group-based programs positioned them to advance the NDPP within our academic health system. Additionally, in the absence of third-party coverage for the NDPP—an issue that has hindered coordinated, large-scale implementation of the program nationwide—members of Adult Diabetes Education and the MEND worked with the University's Medical Benefits Committee to devise a feasible business plan and secure insurance coverage.

After a long period of discussion and deliberation, the University's employer-based insurer, Premier Care, agreed to offer the NDPP as a covered benefit. In Fall 2015, an estimated 3,000 Premiere Care members were identified as having prediabetes through claims data and received letters encouraging participation in a diabetes prevention program offered at one of four sites: the University of Michigan, NKFM, Ann Arbor YMCA, or Omada Health, a web-based alternative. Importantly, physicians and clinic staff were educated on this insurer-led program recruitment strategy, and primary care nurses were trained to answer common patient questions and concerns.

CONCLUSIONS

As residents, we recognized that prediabetes often remained untreated in our clinical practice. Barriers to treatment included physician unawareness of existing community diabetes prevention programs and concern for the patient's out-of-pocket expense. To address these issues, we obtained grant funding and piloted the NDPP within our resident continuity clinic. This small-scale initiative demonstrated successful implementation of a diabetes prevention program within a primary care clinic of a large, academic medical center and led to multidisciplinary, collaborative efforts to expand the NDPP within our institution. Importantly, employer-based insurance coverage of the NDPP enabled sustainable program growth within our health system and also facilitated patient enrollment in programs offered by NKFM and the YMCA. We are now able to offer this evidence-based lifestyle intervention to thousands of individuals with prediabetes, and we

hope that a program of such magnitude may meaningfully reduce rates of diabetes.

Acknowledgements: We acknowledge Linda Smith-Wheelock LMSW, MBA and the National Kidney Foundation of Michigan for their partnership in piloting the NDPP at UMHS. We acknowledge the Adult Diabetes Education Program, particularly Sacha Uelman, RD, CDE, Shirley Kadoura RD, CDE, and Jennifer Wyckoff MD, for their commitment to program development. We acknowledge Dr. William Herman for his support and guidance. We further acknowledge the following medical students for their assistance with data collection: Samuel Shopinski, Ariana Wilkinson, Rachel Bian, Breana Siljander, Ethan Sagher, Kashif Ahmed, and Devika Bagchi.

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Compliance with Ethical Standards:

Funding Source: Institutional grant awarded from the Fostering Innovation Grant. Additional funding for the three programs run by the Adult Diabetes Education dietitian was provided through the discretionary funds of William Herman MD, MPH.

Conflict of Interest: The authors declare that they do not have a conflict of interest.

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