

Power of Prevention: The Pharmacist's Role in Prediabetes Management

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■ **IN BRIEF** Although it is known that the National Diabetes Prevention Program can significantly reduce the incidence of type 2 diabetes in individuals identified as being at high risk, there remains a large number of Americans in underserved areas who are not being reached. The field of pharmacy has the potential to bridge this gap and aid the United States in more comprehensively addressing its national diabetes health crisis, thus changing the future of diabetes for the better.

Prediabetes, a serious health condition characterized by blood glucose values that are elevated but do not meet the criteria to be diagnosed as diabetes, affects 84.1 million Americans. Ninety percent of those with prediabetes are not aware that they have the condition and thus are not taking the appropriate actions to address it (1). Patients with prediabetes are at an increased risk for cardiovascular disease and type 2 diabetes (2).

Without appropriate intervention, a significant number of people with prediabetes will progress to type 2 diabetes within 5 years, and it is predicted that, by 2030, there will be >60 million cases of diabetes in the United States (1). Thus, screening for prediabetes and diabetes risk with an assessment tool to help providers determine whether a diagnostic test should be conducted is crucial.

National Diabetes Prevention Program

For individuals who are at high risk for type 2 diabetes, a lifestyle change program (LCP) modeled on the lifestyle intervention in the Diabetes Prevention Program (DPP) research study (3) should be recommended. The DPP research study offered the

strongest evidence to date for type 2 diabetes prevention. It, and several translation studies that followed, demonstrated that an intensive lifestyle intervention could result in a 7% weight loss and a 58% reduction in the incidence of type 2 diabetes over 3 years (71% diabetes reduction in patients >60 years of age), with sustained risk reduction over several years (3–7).

The Centers for Disease Control and Prevention (CDC)-led National Diabetes Prevention Program (National DPP) was established to help address the public health challenge of prediabetes. This program has four overarching strategic goals (8):

1. Increase the supply and quality of LCPs across the United States.
2. Increase awareness of these LCPs among high-risk adults.
3. Increase coverage by employers and insurers for the National DPP's LCP programs to ensure long-term sustainability.
4. Increase referrals to and participation in LCPs recognized by the CDC's Diabetes Prevention Recognition Program (DPRP).

An Unmet Need

As of June 2018, there were >1,700 CDC-recognized organizations offer-

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ing the National DPP LCP across all 50 states and the District of Columbia (9). Many more programs are needed to adequately reach underserved areas of the country. Additionally, the CDC has identified gaps in the national infrastructure related to program delivery to priority populations, including Medicare beneficiaries, men, visually and physically disabled individuals, African Americans, Asian Americans, Hispanics, American Indians, Alaska Natives, and Pacific Islanders, who are under-represented relative to their disease burden and risk factors.

In 2017, the CDC put out a Notice of Funding Opportunity (NOFO) to promote scaling and sustaining the National DPP, specifically focusing on building the National DPP infrastructure in underserved areas and expanding delivery to priority populations (10). This NOFO, titled “Scaling the National Diabetes Prevention Program in Underserved Areas,” included five strategies:

1. Increase the availability of CDC-recognized organizations in underserved areas.
2. Increase clinician screening and detection of adults with prediabetes or at high risk for type 2 diabetes and referral to CDC-recognized organizations.
3. Increase awareness of prediabetes and enrollment in the LCP.
4. Increase retention rates for participants in the LCP.
5. Increase benefit coverage for participation in the LCP.

The American Medical Association has also identified challenges with managing the prediabetes population. These include the impracticality of physicians alone being able to address a health problem that affects so many patients, the time pressures that would inhibit physicians from effectively delivering the recommended intensive intervention, the inability to address the many social determinants influencing the health of patients outside of the office setting, and the lack of adequate information about

community-based resources for type 2 diabetes prevention (11).

How Pharmacies Can Bridge the Gap

Although the profession of pharmacy is a highly trusted, clinically knowledgeable field with the capacity to build strong community-clinical partnerships, few pharmacies are currently engaged with the National DPP. However, because the National DPP relies on private-public partnerships, pharmacies would make an ideal partner for multiple reasons. Thus, increasing pharmacy engagement with the National DPP program could be crucial to achieve adequate nationwide scaling of its LCP.

Research has shown the positive clinical and economic impact of the role of pharmacists in the delivery of patient care and chronic disease management services, particularly in the area of diabetes management (12–24). Programs such as the American Pharmacists Association (APhA) Foundation’s ProjectIMPACT: Diabetes and other models integrating pharmacists into health care teams in patient-centered medical homes and primary care settings have shown improved clinical outcomes (17–24). The Asheville Project and the APhA Foundation’s Diabetes Ten City Challenge, along with other employer-based programs, have demonstrated that pharmacist integration into patient-centered interdisciplinary health care teams can not only positively affect clinical outcomes, but also reduce health care costs (14–16). More pharmacists and pharmacies are becoming involved in delivering diabetes self-management training (DSMT), and there has been a steady increase in the number of pharmacist diabetes educators in the past 30 years (25,26).

With more than 67,000 community pharmacies in the United States, this sector of health care has great accessibility, particularly in rural and urban settings. Food-store pharmacies comprise about

10% of community pharmacies (27). Millions of people visit a community pharmacy every week, and pharmacists are likely to have multiple daily encounters with patients who are at risk for type 2 diabetes. Although these patients may not frequently seek care from physician’s practices or hospitals, they often have interactions with pharmacists, many of which may reveal the presence of risk factors (28). Pharmacists in the food-store setting have an even greater potential audience among whom they can increase awareness of prediabetes and the National DPP.

Pharmacists play a large role in health promotion through their experience in preventive care. Whether performing health risk assessments and wellness programs, providing immunizations, ensuring medication adherence, or assisting with tobacco cessation, pharmacists have a strong focus in preventive care. Pharmacists follow evidence-based guidelines in managing their patients and understand that lifestyle modification is a necessary “prescription” for diabetes and prediabetes management.

The pharmacy workforce, which includes clinically trained pharmacists and paraprofessionals such as pharmacy technicians, is well equipped to help scale the National DPP. Many pharmacies have been involved with DSMT and have experience in program management and delivery. Pharmacists also have extensive training in diabetes management and motivational interviewing. Their clinical background allows them to provide evidence-based answers to consumer questions, links to DSMT for patients with diabetes, and links to other clinical services as needed.

It is well known that a team-based, patient-centered approach leads to quality, affordable, and accessible health care for patients, and pharmacists are key members of such health care teams. In the Pharmacists’ Patient Care Process outlined by the Joint Commission of Pharmacy Practitioners (29), a patient-centered

approach is used to deliver care in collaboration with other health care team members. At the core of this process, pharmacists document and communicate patient health issues and collaborate with other team members to optimize patient health outcomes.

There are multiple ways pharmacies can engage in the National DPP in an impactful way. The *Rx for the National Diabetes Prevention Program: Action Guide for Community Pharmacists*, developed by CDC in collaboration with pharmacists and pharmacy partners across the country (30), provides useful information, tips, and guidance. At a minimum, pharmacists can increase awareness of prediabetes and the National DPP. Given the frequency of patient encounters in pharmacies each day, coupled with pharmacists' access to clinical information to assess risks, pharmacists are in a prime position to educate at-risk patients about prediabetes and how making modest lifestyle changes could greatly improve their health. Pharmacies can use National DPP's marketing materials in addition to self-developed materials to promote prediabetes awareness and the National DPP.

Pharmacists can also participate in screening and detection activities to identify at-risk individuals and refer them to their health care provider and to CDC-approved LCPs. Screening events can be conducted in a variety of settings and may include administering a risk assessment questionnaire or performing point-of-care tests to assess diabetes risk. Pharmacists and pharmacy staff can incorporate simple screening methods into current services and workflow processes to identify patients with prediabetes.

Delivering the National DPP is one way pharmacies can affect public health beyond the scope of their current practice services. Pharmacies that have the capacity and interest should consider becoming a recognized site to deliver the National DPP's LCP. Because pharmacies are already well equipped to appropriately manage

personal health information and comply with Health Insurance Portability and Accountability Act regulations, these practice settings have the potential to become an effective and unique delivery model for the program.

Pharmacies must strategically consider key factors to ensure that their programs will be sustainable. Reimbursement for delivery is available through some commercial plans, employers, and Medicaid, and now also through Medicare. The ability of pharmacies to process third-party payments and their experience in successfully partnering with employers and health plans to provide health services will allow them to maximize available resources to help improve the cost outcomes of the National DPP LCP for both delivering pharmacies and participants.

Using the entire pharmacy workforce to effectively deliver the program is also key to ensuring program sustainability. Pharmacy technicians, student pharmacists, and residents can serve as primary lifestyle coaches, helping to keep costs lower while also allowing these individuals to practice to the top of their license and promoting their professional growth.

Finally, pharmacy delivery programs should consider alternate delivery models that may help with participant retention and program sustainability. The American Diabetes Association's *Standards of Medical Care in Diabetes—2018* modified an existing recommendation on lifestyle management to include technology-based platforms for the delivery of effective diabetes self-management education and support. These recommendations also highlight the fact that information technology platforms can be effective in delivering DPP-based LCPs, lowering weight, reducing risk for type 2 diabetes and cardiovascular disease, and achieving cost savings, with recent studies supporting this delivery modality. Additionally, the CDC's DPRP certifies these modalities as effective

vehicles for delivery of the National DPP's LCP (2).

An Example of National DPP Delivery by a Pharmacy

One regional division of a national grocery store chain pharmacy has had success in providing the National DPP to patients and customers in its stores. Several factors led to this success, including 1) the pharmacies' connections with other members of the health care team, including local primary care providers and dietitians; 2) their robust history in diabetes and chronic disease management and prevention; 3) their experience in the appropriate management of personal health information and in processing third-party payments; and 4) their unique and convenient practice locations inside food stores. Support from initial grant funding allowed for access to resources such as staff training and program development, participant scholarship opportunities, assistance with billing and reimbursement, and access to a data management system. With an average participant weight loss of 5.2% at 6 months and 6.3% at 1 year across the 15 cohorts served, the program achieved full CDC DPRP recognition in 2017. This innovative program in which pharmacists, dietitians, and technicians collaborate to deliver the National DPP's LCP to priority populations in underserved areas in the United States has begun to use key strategies to expand its LCP and ensure its sustainability, including a combination of face-to-face encounters, distance learning, and digital technology approaches.

Conclusion

Pharmacists are essential members of the health care team aiming to provide optimal patient care. Furthermore, the pharmacy profession has been identified as a vital sector in effectively scaling the National DPP (29). *Healthy People 2020* (31), in its vision to improve the health of all Americans, has many goals. Among them is a key role for pharmacists in achieving national public health initiatives and in

increasing public awareness and understanding of the determinants of health, disease, and disability and of the opportunities for progress (32). Optimally engaging the pharmacy community can aid the United States in more comprehensively addressing its national diabetes health crisis and in changing the future of diabetes for the better.

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Duality of Interest

The author is employed by the Kroger Company. No other potential conflicts of interest relevant to this article were reported.

Author Contributions

B.D.H. is the sole author of this article and, as such, is the guarantor of this work and takes full responsibility for its content.

References

1. Centers for Disease Control and Prevention. *National Diabetes Statistics Report, 2017*. Available from www.cdc.gov/diabetes/data/statistics-report/index.html. Accessed 1 April 2018
2. American Diabetes Association. *Standards of Medical Care in Diabetes—2018*. *Diabetes Care* 2018;41(Suppl. 1):S1–S159
3. Knowler WC, Barrett-Connor E, Fowler SE, et al.; DPP Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med* 2002;346:393–403
4. Li G, Zhang P, Wang J, et al. The long-term effect of lifestyle interventions to prevent diabetes in the China Da Qing Diabetes Prevention Study: a 20-year follow-up study. *Lancet* 2008;371:1783–1789
5. Lindström J, Ihanne-Parikka P, Peltonen M, et al.; Finnish Diabetes Prevention Study Group. Sustained reduction in the incidence of type 2 diabetes by lifestyle intervention: follow-up of the Finnish Diabetes Prevention Study. *Lancet* 2006;368:1673–1679
6. Knowler WC, Fowler SE, Hamman RF, et al.; DPP Research Group. 10-year follow-up

- of diabetes incidence and weight loss in the Diabetes Prevention Program Outcomes Study. *Lancet* 2009;374:1677–1686
7. Nathan DM, Barrett-Connor E, Crandall JP, et al. Long-term effects of lifestyle intervention or metformin on diabetes development and microvascular complications: the Diabetes Prevention Program Outcomes Study. *Lancet Diabetes Endocrinol* 2015;3:866–875
8. Centers for Disease Control and Prevention. National Diabetes Prevention Program: working together to prevent type 2 diabetes. Available from www.cdc.gov/diabetes/prevention/pdf/ndpp_infographic.pdf. Accessed 1 April 2018
9. Centers for Disease Control and Prevention. National Diabetes Prevention Program: registry of all recognized programs. Available from nccd.cdc.gov/DDT_DPRP/Registry.aspx. Accessed 24 June 201
10. Centers for Disease Control and Prevention. New CDC funding opportunity: scaling the National Diabetes Prevention Program in underserved areas. Available from content.govdelivery.com/accounts/USCDC/bulletins/19416f2. Accessed 9 September 2018
11. American Medical Association. Diabetes care begins with diabetes prevention. Available from www.ama-assn.org/events/diabetes-care-begins-diabetes-prevention. Accessed 1 April 2018
12. Cranor CW, Bunting BA, Christensen DB. The Asheville Project: long-term clinical and economic outcomes of a community pharmacy diabetes care program. *J Am Pharm Assoc* 2003;43:173–184
13. Garrett DG, Bluml BM. Patient self-management program for diabetes: first-year clinical, humanistic, and economic outcomes. *J Am Pharm Assoc* 2005;45:130–137
14. Fera T, Bluml BM, Ellis WM, et al. The Diabetes Ten City Challenge: interim clinical and humanistic outcomes of a multisite community pharmacy diabetes care program. *J Am Pharm Assoc* 2008;48:181–190
15. Fera T, Bluml BM, Ellis WM. Diabetes Ten City Challenge: final economic and clinical results. *J Am Pharm Assoc* 2009;49:383–391
16. Iyer R, Coderre P, McKelvey T, et al. An employer-based, pharmacist intervention model for patients with type 2 diabetes. *Am J Health-Syst Pharm* 2010;67:312–316
17. Ip EJ, Shah BM, Yu J, et al. Enhancing diabetes care by adding a pharmacist to the primary care team. *Am J Health Syst Pharm* 2013;70:877–886
18. Johnson KA, Chen S, Cheng IN, et al. The impact of clinical pharmacy services integrated into medical homes on

- diabetes-related clinical outcomes. *Ann Pharmacother* 2010;44:1877–1886
19. Jameson JP, Baty PJ. Pharmacist collaborative management of poorly controlled diabetes mellitus: a randomized controlled trial. *Am J Manag Care* 2010;16:250–255
20. Morello CM, Zadvorny EB, Cording MA, et al. Development and clinical outcomes of pharmacist-managed diabetes care clinics. *Am J Health Syst Pharm* 2006;63:1325–1331
21. McCord AD. Clinical impact of a pharmacist-managed diabetes mellitus drug therapy management service. *Pharmacotherapy* 2006;26:248–253
22. Wallgren S, Berry-Caban CS, Bowers L. Impact of clinical pharmacist intervention on diabetes-related outcomes in a military treatment facility. *Ann Pharmacother* 2012;46:353–357
23. Simpson SH, Majumdar SR, Tsuyuki RT, et al. Effect of adding pharmacists to primary care teams on blood pressure control in patients with type 2 diabetes: a randomized controlled trial. *Diabetes Care* 2011;34:20–26
24. Bluml BM, Watson LL, Skelton JB, et al. Improving outcomes for diverse populations disproportionately affected by diabetes: final results of ProjectIMPACT: Diabetes. *J Am Pharm Assoc* 2014;54:477–485
25. Campbell RK. Role of the pharmacist in diabetes management. *Am J Health Syst Pharm* 2002;59(Suppl. 9):S18–S21
26. Gonzalvo JD, Kruckerber E, Newton ML, et al. Advanced diabetes credentials for the community pharmacist: a pilot study. *J Am Pharm Assoc* 2006;56:274–279
27. Qato DM, Zenk S, Wilder J, Harrington R, Gaskin D, Alexander GC. The availability of pharmacies in the United States: 2007–2015. *PLoS One* 2017;12:e0183172
28. Ross TT, Beahm NP, Okada H, Al Hamarneh YN. Pharmacists as accessible primary health care providers: review of the evidence. *Can Pharm J* 2018;151:4–5
29. Joint Commission of Pharmacy Practitioners. Pharmacists' patient care process. Available from www.pharmacist.com/sites/default/files/files/PatientCareProcess.pdf. Accessed 1 April 2018
30. Centers for Disease Control and Prevention. *Rx for the National Diabetes Prevention Program: Action Guide for Community Pharmacists*. Atlanta, Ga., Centers for Disease Control and Prevention, U.S. Department of Health and Human Services, 2018
31. U.S. Department of Health and Human Services. *Healthy People 2020*. Available from www.healthypeople.gov. Accessed 1 April 2018
32. Woodward LJ, Kahaleh AA, Nash JD, Troung H, Gogineni H, Barbosa-Leiker C. Healthy People 2020: assessment of pharmacists' priorities. *Public Health* 2018;155:69–80