

How Proven Primary Prevention Can Stop Diabetes

John Anderson, MD, Meghan Riley, and Tekisha Dwan Everette

Diabetes is a growing epidemic that brings with it both individual suffering and extraordinary economic consequences. Health care professionals who focus on diabetes know the grim statistics: nearly 26 million people in the United States have diabetes, and another 79 million have prediabetes. Every 17 seconds, another American is diagnosed with diabetes and, if current trends continue, one in three Americans will have diabetes by 2050.

Diabetes and its complications threaten to overwhelm the nation's health care system. The total cost of diabetes and its complications, along with gestational diabetes and prediabetes, was estimated to be \$218 billion in 2007.¹ Medical expenditures resulting from diabetes totaled \$116 billion, including \$27 billion for diabetes care, \$58 billion for chronic diabetes-related complications, and \$31 billion for excess general medical costs.² Additional costs included \$18 billion for undiagnosed diabetes, \$25 billion for prediabetes, and \$623 million for gestational diabetes.² These costs comprise a significant portion of our country's overall health care expenses.² One in five health care dollars is spent caring for people with diabetes,² and one-third of Medicare expenses are associated with treating diabetes and its complications.³ Indirect costs resulting from increased absenteeism, reduced productivity, disease-related unemployment disability, and loss of

productive capacity because of early mortality totaled \$58 billion.²

The goal for diabetes advocates, including health care professionals, is to convince those who create our public policies that slowing these alarming trends and focusing on prevention of type 2 diabetes must be a national priority. Those who decide how our public resources are allocated must understand both the seriousness of diabetes and that there is scientific support for efforts to stem this national epidemic.

The good news is that, after more than a decade of research, an extraordinarily promising intervention has emerged. A nationwide network of community-based diabetes prevention programs modeled after the Diabetes Prevention Program (DPP)⁴ has the potential to save money while improving the overall health of the population. However, to reach the tens of millions of Americans with prediabetes, a solid infrastructure of community-based programs across the nation is required.

The DPP, a landmark National Institutes of Health/National Institute of Diabetes and Digestive and Kidney Diseases clinical trial, provided the best evidence that individuals at high risk for type 2 diabetes can prevent or delay the onset of the disease. The DPP was a major multicenter trial with one goal to determine whether modest weight loss and physical activity could

prevent or delay type 2 diabetes in individuals with prediabetes.

Subjects in the DPP were randomized to the drug metformin or to a lifestyle intervention. The lifestyle cohort was by far the most successful compared to participants who received metformin or a placebo. (A second drug, troglitazone, was also being tested, but that arm was discontinued before completion of the trial because of adverse effects.)

Participants in the lifestyle intervention group received intensive one-on-one training in behavior modification, including proper nutrition and increased physical activity. With modest weight loss through a healthy, low-fat, low-calorie diet and increased physical activity (weight loss goal of at least 7% of body weight and a recommended total of 150 minutes/week of modest physical activity) participants reduced their risk of progression to type 2 diabetes by 58%. The results held across all ethnic groups, and participants > 60 years of age had an even greater reduction of 71%.⁴

More recently, a 10-year follow-up study found that the original participants in the DPP lifestyle group maintained a decreased risk for diabetes over time. A decade after the trial's conclusion, participants in the lifestyle cohort had reduced their risk for diabetes by 34%. Again, individuals > 60 years of age were more successful, demonstrating a decreased risk of progression to diabetes by 49%.⁵

The results of the DPP were groundbreaking, but the cost of the intensive individual counseling model provided to the lifestyle intervention group was relatively high (\$1,400 per participant). However, further research has shown that these results can be replicated at a much lower cost in a community-based group setting. One example is the Diabetes Education and Prevention with a Lifestyle Intervention Offered at the YMCA (DEPLOY) study, which found that YMCA wellness staff can be trained to deliver a group-based lifestyle intervention in a community setting following the DPP model and that this intervention achieves participant outcomes comparable to those of the DPP.⁶

The YMCA's Diabetes Prevention Program (Y-DPP) consists of 16 1-hour sessions at which participants meet with a trained lifestyle coach in a classroom setting. The lifestyle coach teaches participants about healthier eating, physical activity, and gradual behavior change that will help reduce their risk of diabetes. After the initial 16 sessions, participants meet monthly to work on maintaining their progress. The Y-DPP lasts for 1 year.

This community-based, group model can be delivered for a cost of \$275–325 per participant.⁷ The DEPLOY study demonstrated that, with instructor training and a standard curriculum, the YMCA (and likely other community organizations) could deliver this program in cities, towns, and rural areas across the nation for nearly one-fourth of the cost of the DPP.

The group format has the potential to achieve significant cost savings. Indeed, according to the Urban Institute, a national community program modeled on the DPP approach could save the country an estimated \$191 billion in health care costs over 10 years.⁸ Moreover,

75% of the estimated savings would benefit federal health care programs, given the disproportionate burden of diabetes among seniors and the poor.⁸

In an era of ballooning health care costs and federal deficits, a program that improves health and provides cost savings should be a top public priority. But to realize the potential savings, this program must be national in scale, with a strong infrastructure capable of being deployed across the country.

Inspired by this groundbreaking evidence of the DPP and its successful translation into the community through the DEPLOY study, U.S. Senators Al Franken (D-Minn.) and Richard Lugar (R-Ind.) and Congresswoman Susan Davis (D-Calif.) introduced the Diabetes Prevention Act (S. 2734/H.R. 4124) in November 2009. The goal of this bipartisan legislation was to create a national network of diabetes prevention programs modeled on the DPP and delivered in community settings.

At the time this legislation was introduced, Congress was debating comprehensive health reform legislation with an unprecedented emphasis on prevention. Senators Franken and Lugar seized the opportunity to advance diabetes prevention by including a provision to establish the National Diabetes Prevention Program (NDPP) in the Patient Protection and Affordable Care Act (PPACA; P.L. 111–148). With the signing of PPACA on 23 March 2010, the NDPP was created.

The NDPP authorizes the Centers for Disease Control and Prevention (CDC) to develop a national network of proven, low-cost diabetes prevention programs in communities across the country. It is important to note that PPACA authorized this program but did not provide specific funding to implement it. Even without additional funding allocated to

implement this program, the CDC's Division of Diabetes Translation took the lead, with limited resources, in initiating key elements of the NDPP, including funding program sites through the YMCA.

Through a public-private partnership and funding from the CDC and UnitedHealth Group (UHG), the YMCA has succeeded in bringing its diabetes prevention program to 178 sites in 23 states.

As a leading health care company serving > 75 million people around the globe, UHG decided to contribute to the NDPP based on the premise that preventing diabetes through this program makes good business sense. UHG vice president Tom Beauregard stated, "The pilot data showed that paying for these services works. People get and stay healthier, leading to dramatically lower health care costs for employers and the health care system." UHG has not only committed funding to expand sites through the YMCA, but also has pledged to provide coverage for these community programs at no charge to beneficiaries.

The efforts of the YMCA and UHG are encouraging, but without a dedicated federal funding stream for the NDPP, the network of sites will not be expanded to all 50 states and will only be able to reach a small fraction of the 79 million Americans with prediabetes. The NDPP was designed to be delivered by a range of different entities, including national networks of community-based nonprofit organizations, state and local health departments, tribal organizations, academic institutions, and other organizations deemed appropriate by the Secretary of Health and Human Services (HHS).⁹ Dedicated federal funding is necessary to increase the number of sites and expand the infrastructure of the NDPP beyond its current reach.

Additional elements also need to come together for the NDPP to achieve full success. The CDC has developed program standards. Finalized in December 2011, these standards will have to be met by all entities seeking to provide the NDPP and will ensure a consistent and effective curriculum across the network of programs.

The CDC recognition program will evaluate program data and help ensure that participants in each community program have the same opportunity to achieve success. Standardized programs that have produced positive results with data to back their success will be attractive to both the government, which determines whether federal health programs will reimburse for the NDPP, and other third-party health payers who can provide coverage.

Bringing the NDPP to scale will also require a system to create local sites where trained staff will deliver the intervention to individuals at high risk for diabetes through the approved curriculum. With this in mind, the CDC has already established the Diabetes Training and Technical Assistance Center (DTTAC) at Emory University in Atlanta, Ga., to help train staff to deliver the program appropriately. DTTAC will provide training services to community-based organizations seeking recognition by the CDC to deliver the NDPP.

Further funding is also needed for public education, both for the at-risk population and for health care providers, to raise awareness of the program's existence and help maximize the number of program participants.

Last fall, the Senate Appropriations Committee voted for the first time to fund the NDPP, approving \$10 million from the Prevention and Public Health Fund, established by the Affordable Care Act, to

expand the NDPP. In conjunction with the final appropriations bill that was signed by the president in December 2011, Congress provided a list of recommendations to the HHS secretary for utilizing the Prevention and Public Health Fund. These recommendations included a request for \$10 million in funding for NDPP.¹⁰ Subsequently, on 13 February 2012, HHS provided \$10 million in fiscal year 2012 funding for CDC to administer the NDPP through the Prevention and Public Health Fund. This funding is an important start, but to be truly successful, the NDPP needs continued funding capable of bringing the program to nationwide scale.

The Prevention and Public Health Fund is an appropriate source for this funding. It provides \$15 billion over 10 years to programs that improve health and rein in growing health care costs. As a proven program that can prevent diabetes and save health care dollars, the NDPP exemplifies the dual role of the fund. Moreover, as pressure increases in Congress to cut funding and reduce the federal deficit, it is crucial that policymakers are aware that a federal investment in evidence-based diabetes prevention is the path to significant cost savings.

The government should also take advantage of other opportunities to make this program available to people at risk for diabetes. Based on the potential cost savings to federal health programs, a logical next step would be to provide access to the program for Medicare and Medicaid beneficiaries. The success of this program in the senior population demonstrates that providing this service to at-risk Medicare beneficiaries will reduce the incidence of diabetes and its complications among seniors and reduce rising Medicare costs.

States and localities should also add coverage of the NDPP through Medicaid programs to simultaneously improve the health of the Medicaid population and reduce their health spending. Some states and cities are already working to do this. For example, on 17 November 2011, it was announced that Medicaid beneficiaries in the New York City tri-state area will be able to participate in the Y-DPP programs through UHG's Diabetes Prevention and Control Alliance.¹¹

The federal government has already made a significant investment in the DPP, developing and testing this model in the clinical setting and translating it into the community setting. In the face of the epidemic that is diabetes, we cannot afford to turn our back on our own success. Rather, to achieve a return on that original investment, policymakers must now invest in the NDPP through direct funding to expand its reach and through coverage of the program within government health agencies. These steps will have ongoing benefits for the physical and fiscal health of our nation and will bring us closer to stopping diabetes.

Although many efforts surrounding the NDPP are ongoing, much more needs to take place before the program will be widely available to the population at greatest risk for diabetes. Health care professionals concerned about the diabetes epidemic are encouraged to add their voices to those advocating for this successful program. Take the first step by visiting www.diabetes.org/advocate to become a diabetes advocate. For more information on existing diabetes programs, visit the CDC's website (<http://www.cdc.gov/diabetes/prevention/index.htm>).

REFERENCES

- ¹Dall TM, Zhang Y, Chen YJ, Quick WW, Yang WG, Fogli J: The economic burden of diabetes. *Health Aff* 29:287–303, 2010
- ²American Diabetes Association: Economic costs of diabetes in the U.S. in 2007. *Diabetes Care* 31:576–615, 2008
- ³Centers for Medicare and Medicaid. [December 27, 2005]. Medicare fact sheet: Medicare health support to improve care of beneficiaries with chronic illnesses [article online]. Available from at http://www.cms.gov/ccip/downloads/overview_ketchum_71006.pdf.
- ⁴DPP Research Group: Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med* 346:393–403, 2002
- ⁵DPP Research Group: 10-year follow-up of diabetes incidence and weight loss in the Diabetes Prevention Program outcomes study. *Lancet* 374:1677–1686, 2009
- ⁶Ackermann RT, Finch EA, Brizendine E, Zhou H: Translating the Diabetes Prevention Program into the community: the DEPLOY pilot study. *Am J Prev Med* 35:357–363, 2008
- ⁷Ackermann RT, Marrero DG: Adapting the Diabetes Prevention Program lifestyle intervention for delivery in the community; the YMCA model. *Diabetes Educ* 33:74–78, 2007
- ⁸Berenson RA, Holahan J, Blumberg LJ, Bovbjerg RR, Waidmann T, Cook A, Williams A: How we can pay for health care reform. Urban Institute, 2009. Available online from www.urban.org/health_policy/url.cfm?ID=411932.
- ⁹U.S. Public Law 111–148, the Patient Protection and Affordable Care Act. Available online from www.gpo.gov/fdsys/pkg/BILLS-111hr3590enr/pdf/BILLS-111hr3590enr.pdf
- ¹⁰Healthy Americans: Prevention and public health fund: detailed activities by agency. Available online from <http://healthy-americans.org/health-issues/wp-content/uploads/2011/12/PPHF-2010-2012-12-19-112.pdf>
- ¹¹UnitedHealth Group: Diabetes Prevention and Control Alliance programs available to Medicaid recipients for the first time, starting in New York City tri-state area: proven programs offered through UnitedHealthcare Community & State [article online]. Available from <http://www.marketwatch.com/story/diabetes-prevention-and-control-alliance-programs-available-to-medicare-recipients-for-the-first-time-starting-in-new-york-city-tristate-area-2011-11-17>. Accessed 19 January 2012

John Anderson, MD, is president of the Frist Clinic in Nashville, Tenn., and president-elect, medicine and science of the American Diabetes Association (ADA). Meghan Riley is the associate director, and Tekisha Dwan Everett is the managing director of Federal Government Affairs at ADA in Alexandria, Va.