

Diabetes Prevention and Management: The Thrill Is Not Gone

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Editor's note: This article is adapted from the address Dr. Albright delivered as the recipient of the American Diabetes Association's Outstanding Educator in Diabetes Award for 2013. She delivered the address in June 2013 at the association's 73rd Annual Meeting and Scientific Sessions in Chicago, Ill. A webcast of this speech is available for viewing at the ADA website (http://professional.diabetes.org/Presentations_Details.aspx?session=4295).

It is a thrilling time to be working in diabetes. That is not to say that everything is wonderful, and some of it makes you pretty anxious. But it is a time when the need has never been greater, and there is so much on the line. Are we going to prevent enough new cases of diabetes before we reach a threshold at which one out of three people has it? Are we going to improve diabetes care in ways that will allow all of those affected to be healthy and productive and not leave far too many people experiencing the ravages of this disease? Will we find cures so that, in the future, no one ever has to face this disease in any of its forms? I would like to address some of these questions, and in so doing, I hope to demonstrate that, in the field of diabetes prevention and management, the thrill is not gone.

Providing Self-Management Education and Support

When I was diagnosed with type 1 diabetes 45 years ago, there was really nothing resembling diabetes self-management education (DSME). I am *thrilled* that today not only is DSME recognized as integral to successfully living with diabetes, but so

is ongoing support. That support can take many forms. It may be access to community health workers or peer educators; tools and materials like those from the National Diabetes Education Program or the American Diabetes Association; social networking and other virtual supports; or changes to the built environment in communities that make healthy choices easier to adopt.

The acknowledgment that ongoing support is crucial for making behavior changes, maintaining healthy diabetes behaviors, and addressing psychosocial concerns is a huge step forward and long overdue. The challenge before us is not only to acknowledge that self-management is an ongoing process and must occur both within and outside of the health care setting, but also to make the supports that facilitate self-management a reality for many more people.

DSME and ongoing support are the soul of diabetes care. Working in diabetes education is a special mission. In thinking about my role model—my mother—who was the quintessential diabetes educator, she certainly knew her stuff. She listened, and through listening was able to help people develop realistic solutions. And, she had a wonderful sense of humor that helped her and those around her have fun as they tackled the challenges posed by diabetes.

Reducing Health Disparities

In the past decade, health outcomes in areas such as visual impairment and end-stage renal disease have improved for the average person with diabetes.¹ However, more remains to be done, and it is especially impor-

Table 1. Education-Related Disparities in Risk, Care, and Outcomes in the U.S. Population With Diabetes

	Individuals With Less Than a High School Education	Individuals With More Than a High School Education
Outcomes		
Diabetes incidence (per 1,000)	11.6	6.6
Diabetic retinopathy prevalence (%)	6.9	2.7
All-cause mortality (deaths per 100 with diabetes)	2.1	0.7
Prediabetes (%)	39.4	32.5
Care and Behaviors		
Blood pressure > 130/80 mmHg (%)	55.2	46.9
A1C > 8% (%)	24.1	20.1
Smoking prevalence (%)	31.1	16.6
No yearly eye care among visually impaired (%)	64.6	41.0

tant to address the significant health disparities that continue to exist in both the provision of diabetes care and its health outcomes.

Data on such health disparities are sobering. Recent data from our group at the Centers for Disease Control and Prevention (CDC) (Table 1)²⁻⁴ show that those with less than a high school education have significantly more risk factors, worse outcomes, and a higher incidence of diabetes. Figure 1A shows county-level estimates of diagnosed diabetes, along with the percentage of people

living in poverty. One can see that those areas with higher diabetes prevalence rates also have higher levels of persistent poverty. Figure 1B provides a clearer view of areas with high rates of persistent poverty and a diabetes prevalence > 11.1%. Table 2 shows average out-of-pocket medical expenses for families with a member who has diabetes. Although such expenses are greater in families with higher incomes, the percentage of a family's total income spent on out-of-pocket medical expenses is greater in families of lower income levels.

If we are to really address health disparities, we also need to address the social determinants of health, and that means looking at diabetes through a socio-ecological lens. I am *thrilled* that there is growing recognition that diabetes is not just experienced by the individuals who have it and that improving health outcomes is not just about what those people can do for themselves.

As shown in Figure 2, a more ecological model of health appropriately keeps the individual with diabetes at the center of attention for effective

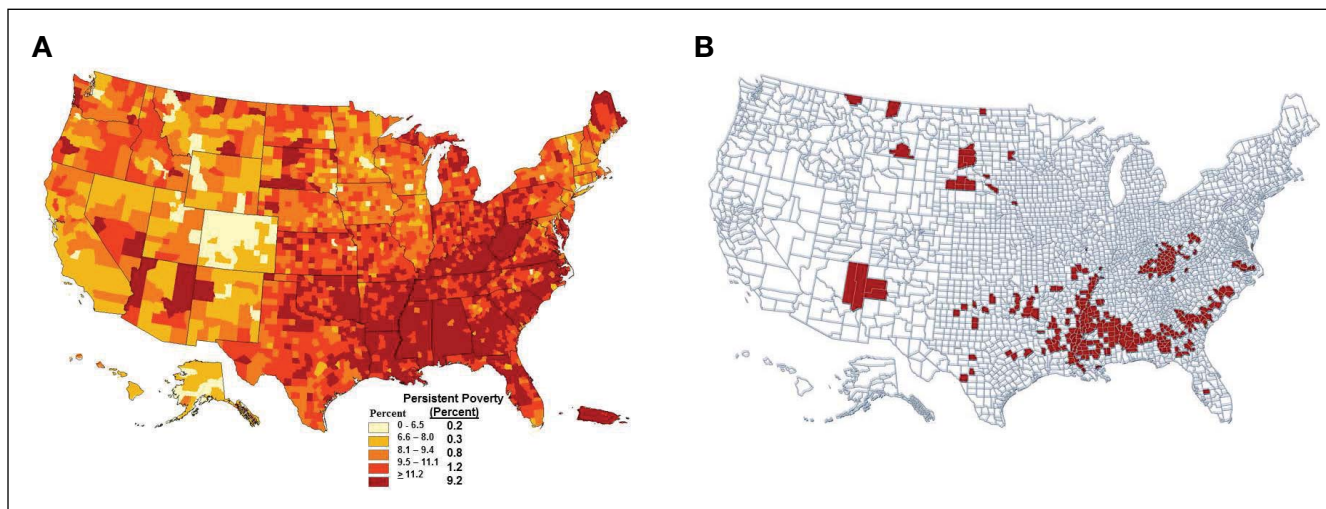


Figure 1. The link between persistent poverty and diabetes prevalence. (A) County-level estimates of diagnosed diabetes among U.S. adults aged ≥ 20 years and persistent poverty rates, 2009. (B) Counties in persistent poverty that have a diabetes prevalence rate > 11.1%. From the National Diabetes Surveillance System, Centers for Disease Control and Prevention.

Table 2. Average Out-of-Pocket Expenses (OOPE)* for Families With Members Who Have Diabetes According to Level of Income in U.S. Adults Aged 16–64 years, 2001–2008¹⁰

Income Level	2010 OOPE (\$)	Percentage of Income	Percentage Having OOPE \geq 10% of Total Family Income
Poor (< 125% FPL)	2,400	17	48
Low income (125–200% FPL)	3,600	12	42
Middle income (200–400% FPL)	4,300	8	30
High income (\geq 400% FPL)	5,100	5	11

FPL, federal poverty level.

*Unpublished analysis from the CCD Division of Diabetes Translation.

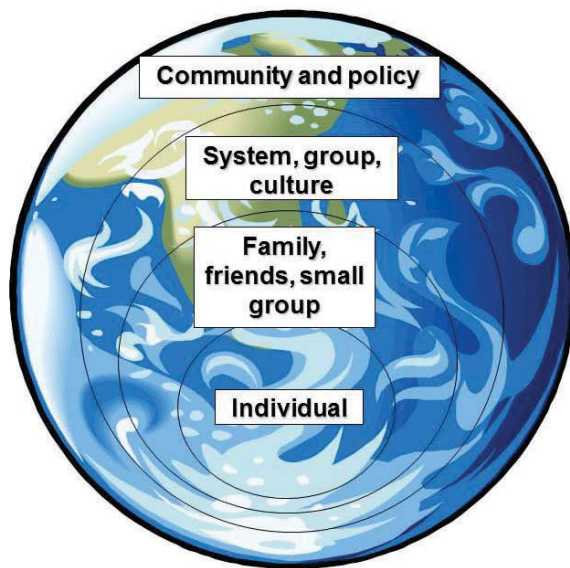


Figure 2. An ecological model of health.

diabetes management. But attention is also directed outward toward the patient's close network of family and friends (people who are important as sources of support and health promotion or who may be at higher risk for diabetes themselves). The ecological model continues outward, beyond patients' personal networks, to also focus on systems (e.g., schools and work environments) that affect their lives and cultures with which they identify. And, finally, this model expands outward still to encompass the greater communities in which patients live and the policies and practices that affect health at the local, state, and national levels. Thus, the health of the individual is inseparable from the health of the community.

To effectively address health disparities, we must engage not only in

health care, but also in issues of economic development, transportation, education, and housing. It is an awesome responsibility to address social determinants of health and achieve improved health for all, but it is one from which we cannot shy away. Are you involved in helping to create health-promoting communities and organizations? Are you helping your patients consider opportunities to be involved? It is going to take many of us, but it begins with one.

Changing Our Course: National Diabetes Prevention Program

CDC estimates indicate that, if we stay on our present course, as many as 1 in 5 people in the United States could have diabetes by 2025.⁵ We need to continue to make scientific discoveries to further the prevention of diabetes. We also need to imple-

ment what we already know could help, and that is quite a lot. The clock is ticking. I am *thrilled* that we are building the National Diabetes Prevention Program (National DPP) (Figure 3)⁶ in the United States and working with colleagues throughout the world who are committed to preventing type 2 diabetes. This is an opportunity to organize ourselves around a structured lifestyle change program that is supported by randomized, controlled trials and several translation studies.^{7–10} A major focus of the translation studies has been how best to use limited resources to deliver the lifestyle intervention, while ensuring that weight loss is adequate to decrease future cases of type 2 diabetes.

Moving diabetes prevention from research to implementation in communities is a major undertaking. A concerted focus on building the infrastructure for delivery of a lifestyle change intervention adapted from the Diabetes Prevention Program study⁷ did not begin in the United States until 2010, when Congress authorized the CDC to establish and lead the National DPP. The National DPP is more than a program; it represents an approach to implement a low-cost intervention based on the DPP in communities across America. Its foundation is a results-driven partnership that includes community-based organizations, health insurers, employers, health care systems, academia, government agencies, and others.

The National DPP puts in place the elements for enacting the large-scale implementation necessary to reduce the incidence of type 2



Figure 3. Components of the National DPP. From the CDC Division of Diabetes Translation.

diabetes. The CDC's approach to the National DPP has four core elements.

Training. A trained workforce that can deliver the lifestyle change intervention cost-effectively is necessary. The number of people with prediabetes requires that we expand our workforce to meet the demand. A meta-analysis conducted by Ali et al.¹¹ demonstrated that health professionals and lay community workers can effectively deliver the lifestyle change intervention. In response to this training need, the CDC established and helped support the Diabetes Training and Technical Assistance Center (DTTAC) at Emory University in Atlanta, Ga. DTTAC provides comprehensive training services across the country to prepare lifestyle coaches to effectively deliver the lifestyle change intervention. Other organizations also provide effective training for lifestyle coaches. It is important to ensure that whatever training services are used provide a level of training that will allow an organization's lifestyle change program to meet CDC Recognition Program standards.

CDC Diabetes Prevention Recognition Program. The Recognition Program has been designed to ensure the quality, consistency, and broad dissemination of the lifestyle change intervention; to develop and maintain a registry of organizations that are recognized for their ability to deliver an effective program; and to provide technical assistance to organizations that have

applied for recognition. Recognition standards are used to ensure consistent quality wherever the program is delivered. They provide assistance to individuals who are at risk and considering participating, health care professionals who are considering referring their patients, and insurance providers who are considering whether to pay for the program. The standards were developed with input from a variety of experts and from a public comment period. The standards will be examined every few years to accommodate new evidence. The CDC is responsible for the recognition program, and there is no cost to apply. More information is available at the CDC website (www.cdc.gov/diabetes/prevention/recognition).

Intervention sites. The most prominent core element of the National DPP is delivery of the lifestyle change program through numerous sites, including community-based organizations, workplaces, and health care facilities. More than 600 of these organizations have completed the application process for CDC recognition. There are now National DPP sites in 48 states and the District of Columbia and many more are needed.

Payment is a crucial component to ongoing delivery of the lifestyle change program. The nation's largest private insurer, UnitedHealth Group, and the largest not-for-profit lifestyle program provider, the YMCA, were the first organizations to formally partner with the CDC in the

National DPP. UnitedHealth Group developed the Diabetes Prevention and Control Alliance, a service provider that created and operates the technology, business processes, and infrastructure that support participant identification, engagement, and enrollment. The alliance also works with any insurance company or self-funded employer to assist them in providing the program as a covered benefit and reimbursing organizations that deliver the program. Several other health insurance companies and community organizations are now working together through the alliance to administer the lifestyle change program. Other organizations that are in a position to provide the administrative functions to connect payers to delivery organizations are now forming; this represents a new model for sustainable delivery of the lifestyle change program.

Various groups are also testing delivery of the lifestyle change program through social networks, television, and the Internet to increase reach. In one study, the program was filmed as a reality TV show with real people who have prediabetes going through the program. Research participants viewed the TV segments, received supplemental coaching through the Internet, and were given an electronic scale so their weights would not be self-reported. The results of this study have been submitted for publication (Ackermann RT et al., unpublished observations). Another group is testing delivery of the lifestyle change program through a social-network model. Virtual groups are formed by matching participants using a set of characteristics thought to support effective group dynamics. The curriculum is delivered virtually by coaches, and participants have the opportunity for other virtual supports. This has been piloted and is now being tested in a larger study (Sepah C, unpublished observations). The CDC is eager to see the results of these important studies and to learn from them ways in which the lifestyle change program can be delivered in different modes. This will be crucial to achieve adequate reach.

Health marketing. Even the best lifestyle change programs will not succeed without adequate uptake. National DPP partners are working on strategies to increase referrals to and participation in the lifestyle change intervention. Various participant engagement strategies are being evaluated, as well as methods to increase health professionals' understanding and support of the program.

The question before all of us is: can we do it? Can we pool our knowledge, skills, and resources to implement the most proven intervention to prevent type 2 diabetes across the country? Do we have the emotional intelligence and the will to make it happen? Or, will we settle for fragmented efforts that will never bring the intervention to scale and thus allow continued growth in the prevalence of type 2 diabetes? I believe that we can succeed and that we must succeed. People are counting on us. This is truly a time to be part of the solution and not part of the problem.

Promising Research

I am *thrilled* to work at CDC with an amazing team of public health scientists who are doing world-class public health research. Such research contributes to our understanding of how population health is influenced by genetic, environmental, and social determinants. It also identifies effective interventions for improving health and reducing health disparities. I would like to share two of the research studies CDC is leading in partnership with the National Institutes of Health and outstanding teams of investigators across the country.

Natural Experiments for Translation in Diabetes (NEXT-D) study. This 5-year research network is designed to test the effectiveness and sustainability of population-targeted diabetes prevention and control policies emerging from health care systems, business and community organizations, and health care legislative initiatives.¹² It includes large-scale natural experiments (i.e., effectiveness studies) and rigorously designed prospective studies of ongoing or imminent diabetes prevention

and control interventions.

Topics under investigation include the impact of an employer-mandated switch to high-deductible health plans on diabetes outcomes and disparities, the effect of using electronic medical records with decision-support tools on diabetes risk detection, the adoption of diabetes prevention interventions in community health centers, and the effects on primary and secondary prevention of a health plan designed to reduce out-of-pocket costs for patients with prediabetes and diabetes. These studies will help to quantify the impact of population-targeted policies on preventive behaviors, quality of care, morbidity, and intended and unintended intervention consequences. In addition, NEXT-D is developing innovative design and evaluation approaches to naturally occurring population-based interventions.

SEARCH for Diabetes in Youth study. This national, multicenter study is aimed at understanding more about diabetes among children and young adults in the United States. SEARCH, which was launched in 2000, has been helping to find answers about the prevalence of various types of diabetes and complications, as well as how having diabetes affects the lives of young people. More than 20,000 study participants representing different racial and ethnic backgrounds have helped

SEARCH determine the extent of diabetes in American communities and its impact on different segments of the population.

Ongoing Translation and Future Directions

Conducting this type of research is crucial. Translating research findings into practice is critical to improve the health of millions of people. Figure 4 shows the steps necessary in this process.^{13,14}

It is important to reach the top of the stairway. Basic science forms the foundation. Those of us with diabetes are alive today because of many of these discoveries. We also need to examine research questions in ideal settings to determine if something is even possible. The DPP⁷ is a great example of a very important efficacy trial. This study told us that, under ideal conditions, we can prevent or delay type 2 diabetes in those at high risk. Next, we need to determine how well interventions tested in ideal settings can perform in the real world and what adjustments are necessary to make that transition. The numerous translation studies that have been done in diabetes prevention have helped make the implementation of the lifestyle intervention possible.

The three final steps in the stairway are too often underappreciated and minimally addressed. We do a

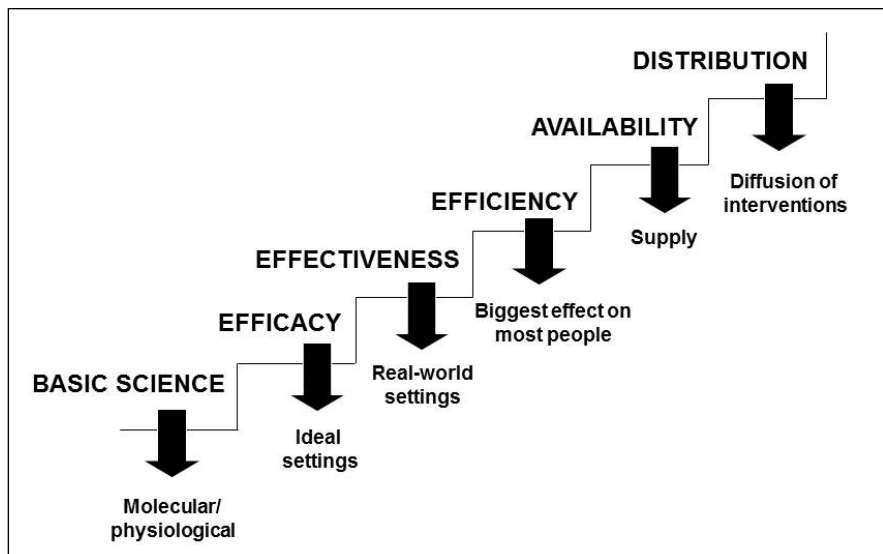


Figure 4. Steps along the “stairway” of research translation. Adapted from Refs. 13 and 14.

disservice to the research investments in the first three steps if we do not determine ways to translate research findings so they have the biggest effect on the most people, to ensure that we have an adequate supply of the interventions, and to find ways to diffuse the interventions to make them sustainable. The National DPP serves as a great example of how we are working to move diabetes prevention to the top of the stairway.

Securing funding for research, conducting studies, and translating findings for wide-scale implementation are all challenging. The process is one of stops and starts, adjustments, and persistence. We cannot let ourselves get dragged down, but instead must continually recommit to the important research and work we do on behalf of those with or at risk for diabetes.

There is so much going on in diabetes and so much to be done. We are certainly living and working in a *thrilling* time. What thrills me most and matters most to me are the people: the people in our families, who love and support us; our friends who add such richness to our lives; the colleagues who make our daily work stimulating and rewarding; and people everywhere, who deserve a world free of the devastation of diabetes. This journey is *thrilling* because of all of them.

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