Presentation

Improving health and equity in diabetes and cardiovascular disease

- **Professor Felicia Hill-Briggs**, Professor of Medicine and Sr. Director of Population Health Research and Development, Johns Hopkins University and Medicine; Immediate Past President, American Diabetes Association; US NAM member
The Case for Improving Health and Equity in Diabetes

In the US:

- 1 in 10 people has diabetes
- 1 in 3 adults has prediabetes
- In 2017, total economic cost of diagnosed diabetes was $327 billion USD
- Ranked first in combined public health and health care (hospitalizations, emergency care, outpatient care, skilled nursing facility care) spending

Diabetes is a disease of health inequities by socioeconomic status, race/ethnicity, and geography

Behavioural and social determinants account for 60 – 70% of disease outcomes

Diabetes Population Health Model

Health Equity

Population Risk Stratification

Risk of Diabetes Onset

Risk of Diabetes Morbidity, Excess Utilization

Healthy Lifestyle and Diabetes Prevention

Population Health Interventions

Diabetes Care

Health and Wellness Interventions

Community-based Interventions

Policy

Multisector Collaborations

Community–Clinic Partnerships

Inpatient (Acute) Interventions

Ambulatory Care Interventions

Intermediate Outcomes

(Health care quality measures, Intervention Outcomes, Patient satisfaction, Cost/value)

Population Health Outcomes

(Mortality rate, disability, disease burden, quality of life, summary population measure)

Interventions for Population Health *Improvement*

- Proactive initiatives with goals of *prevention, risk reduction, health equity, and health promotion*
- Reduce need for care before individuals enter the healthcare system
- Reduce reliance on healthcare services by addressing the social and behavioural determinants that give rise to care that could have been avoided

Behavioural and Social Determinants in Diabetes

SDOH

Education and Literacy

Economic Stability

Problem Solving

Healthy Eating

Physical Activity

Housing and Built Environment

Social and Community Context

Acute Complications

Healthy Coping

Self-Monitoring

Health and Health Care

Taking Medications

U.S. Diabetes Prevention Program (DPP)

Example of an Intensive Lifestyle Intervention’s Path from Research to Policy and Practice
REDUCTION IN THE INCIDENCE OF TYPE 2 DIABETES WITH LIFESTYLE INTERVENTION OR METFORMIN

DIABETES PREVENTION PROGRAM RESEARCH GROUP

ABSTRACT

Background Type 2 diabetes affects approximately 6 percent of adults in the United States. Some risk factors for the development of diabetes are modifiable, such as the onset of obesity and an oral glucose load, while others are not. The lifestyle intervention arm of the Diabetes Prevention Program, a randomized trial of lifestyle intervention or metformin for prevention of type 2 diabetes, was associated with a 31% reduction in the cumulative incidence of diabetes compared with placebo.

Methods Randomly assigned 3234 nondiabetic persons with elevated fasting and post-load plasma glucose concentrations to placebo, metformin (850 mg twice daily), or a lifestyle modification program with the goal of at least 7 percent weight loss and at least 150 minutes of physical activity per week for 2.8 years. The mean age of the participants was 53 years, and the mean body-mass index (weight in kilograms divided by the square of the height in meters) was 34.0: 68 percent were women, and 45 percent were members of minority groups.

Results The average follow-up was 2.8 years. The incidence of diabetes was 11.8, 7.5, and 4.4 cases per 100 person-years in the placebo, metformin, and lifestyle intervention arms, respectively. The lifestyle intervention reduced the incidence by 38 percent (95 percent confidence interval, 4.1 to 68 percent), and metformin reduced the risk by 37 percent (95 percent confidence interval, 17.5 to 47 percent), as compared with placebo. The lifestyle intervention was significantly more effective than metformin. To prevent one case of diabetes during a period of 3.2 years, 4.9 persons would have to participate in the lifestyle intervention program, and 10.9 would have to receive metformin.

Conclusions Lifestyle changes and treatment with metformin both reduced the incidence of diabetes in persons at high risk. The lifestyle intervention was more effective than metformin.
Translating the Diabetes Prevention Program into the Community
The DEPLOY Pilot Study

Ronald T. Ackermann, MD, MPH, Emily A. Finch, MA, Edward Briz zendine, MS, Honghong Zhou, PhD,
David G. Marrero, PhD

Background: The Diabetes Prevention Program (DPP) found that an intensive lifestyle intervention can reduce the development of diabetes by more than half in adults with prediabetes, but there is little information about the feasibility of offering such an intervention in community settings. This study evaluated the delivery of a group-based DPP lifestyle intervention in partnership with the YMCA.

Methods: This pilot cluster-randomized trial was designed to compare group-based DPP lifestyle intervention delivery by the YMCA to brief counseling alone (control) in adults who attended a diabetes risk-screening event at one of two semiurban YMCA facilities and who had a BMI ≥24 kg/m², ≥2 diabetes risk factors, and a random capillary blood glucose of 110–199 mg/dL. Multivariate regression was used to compare between-group differences in changes in body weight, blood pressures, Hba1c, total cholesterol, and HDL-cholesterol after 6 and 12 months.

Results: Among 92 participants, controls were more often women (61% vs 50%) and of nonwhite race (29% vs 7%). After 6 months, body weight decreased by 6.0% (95% CI=4.7, 7.3) in intervention participants and 2.9% (95% CI=0.6, 3.5) in controls (p<0.001; difference between groups). Intervention participants also had greater changes in total cholesterol (~22 mg/dL vs +6 mg/dL controls; p<0.001). These differences were sustained after 12 months, and adjustment for differences in race and gender did not alter these findings. With only two matched YMCA sites, it was not possible to adjust for potential clustering by site.

Conclusions: The YMCA may be a promising channel for wide-scale dissemination of a low-cost approach to lifestyle diabetes prevention.

Introduction: More than 60 million Americans have prediabetes, defined by impaired glucose tolerance (IGT) or impaired fasting glucose (IFG). People with prediabetes are at increased risk for developing diabetes, cardiovascular events, and other obesity-related adverse health outcomes. Because the prevalence of obesity is increasing in all segments of the population, the burden of prediabetes and diabetes will continue to escalate. Identifying strategies to prevent diabetes on a national scale is indeed a public health priority.

Federal Agency and Health Organization Prioritizing of Diabetes Prevention

1. Centers for Disease Control and Prevention (CDC) and National Institutes of Health (NIH)/NIDDK
   - Reports and national statistics
   - Addition of prediabetes

2. American Diabetes Association (ADA)
   - Standards of Care chapter on Lifestyle Intervention for Prevention of Type 2 Diabetes
   - ADA Governmental Affairs advocacy
   - Risk Test

3. U.S. Congressional Diabetes Caucus
   - Combined Senate Diabetes Caucus and House Diabetes Caucus
The Diabetes Prevention Act of 2009

Amends the Public Health Service Act to direct the Secretary of Health and Human Services (HHS), acting through the Director of the Centers for Disease Control and Prevention (CDC), to establish a national diabetes prevention program targeted at persons at high risk for diabetes.
CDC Establishes the U.S. National Diabetes Prevention Program (DPP)


1. **Intensive Lifestyle Change Program Standardization**
   1. Structured curriculum
   2. DPP Lifestyle Coach training and CDC certification
   3. Specific goals, performance metrics, and reporting requirements
   4. Deployment in public health and health care settings with CDC Recognition

2. **Health Equity**
   1. Plain language (Plain Writing Act of 2010)
   2. New community-based and non-clinical settings and workforces
   3. Expanded delivery modes (groups, virtual)
   4. Social cohesion and integration facets
   5. Insurance reimbursement to community settings and DPP lifestyle coaches
Public Health Care Coverage for DPP in Vulnerable Populations: Medicare Effectiveness and Cost Effectiveness Trial (CMMI)

Average 5% Weight Loss at 6 months and 1 Year

% Weight Loss

-6% -5% -4% -3% -2% -1% 0% 5/26 6/26 7/26 8/26 9/26 10/26 11/26 12/26 1/26 2/26 3/26 4/26

Goal Average

Cost savings: $2,650/enrollee over 15 months compared to beneficiaries not in program
Newly Diagnosed Diabetes, Age-Adjusted Rate per 1000 Adults Aged 18-76 Years-Total, 1996 – 2015

Source: www.cdc.gov/diabetes
Disclaimer: This is a user-generated report. The findings and conclusions are those of the user and do not necessarily represent the views of the CDC.
Realizing the Full Health Equity Potential of the DPP: Challenges and Gaps

• Scaling to meet national and international demand
  • Improving effectiveness of virtual DPP programs in meeting DPP outcomes in socioeconomically diverse populations

• Maintaining program quality and fidelity as lay DPP Lifestyle Coach workforces grow
  • Infrastructure and support for data collection, monitoring, and reporting from community programs

• Implementing earlier intervention points on the continuum (shift from prediabetes to broader health promotion for physical inactivity, healthy eating, and weight management)