DIABETES PREVENTION PROGRAM: OFFER OR REFER?

66TH ADVANCED POSTGRADUATE COURSE

FEBRUARY 23, 2019

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In compliance with the accrediting board policies, the American Diabetes Association requires the following disclosure to the participants:

Victoria C. Costales, MD, MPH

Disclosed no conflict of interest.
Review the timeline of the National Diabetes Prevention Program (NDPP).

Discuss considerations related to offering/implementing the DPP.

Discuss key steps and considerations related to referring to DPP Programs.

Explore examples of approaches that combined DPP implementation and DPP referral.
TIMELINE Diabetes Prevention Program

1996
RCT Lifestyle vs Rx
NIH initiates RCT of Lifestyle Program versus Metformin to decrease Type 2 DM incidence

2002
Landmark RCT results published
Decrease in diabetes incidence (58% LCP vs 31% Rx) over 3 years

NIH initiates RCT of Lifestyle Program versus Metformin to decrease Type 2 DM incidence
GOOD NEWS: LIFESTYLE CHANGE WORKS

The lifestyle change program that is part of the CDC-led National Diabetes Prevention Program is proven to help prevent or delay type 2 diabetes. It is based on research that showed:

- Weight loss of 5 to 7% of body weight achieved by reducing calories and increasing physical activity to at least 150 minutes per week resulted in a 58% lower incidence of type 2 diabetes.
- For people 60 and older, the program reduced the incidence of type 2 diabetes by 71%.
- After 10 years, lifestyle change program participants had a 34% lower incidence of type 2 diabetes.

Decrease in diabetes incidence (58% LCP vs 31% Metformin) over 3 years

NIH initiates RCT: Lifestyle Change Program (LCP) versus Metformin to decrease Type 2 DM incidence

Landmark RCT results published

RCT Lifestyle vs Rx

2002

2008 - 2013

DPP Translation Studies

2008

Initial National DPP framework and partner convening by the CDC
Framework for the National DPP developed and key stakeholders convened

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>CDC funded the Y-USA to offer the translated version of the DPP lifestyle change program in a community setting in Louisville, KY, and to expand to communities across the country as part of a staged roll-out plan.</td>
</tr>
</tbody>
</table>

TRANSLATION STUDIES
TIMELINE: 2008-2013

Congress authorizes the CDC to establish the National Diabetes Prevention Program

### HbA1c criteria for DM and Prediabetes

The 2010 American Diabetes Association (ADA) standards of care for diabetes, added hemoglobin A1c (HbA1c) as diagnostic criteria for diabetes (≥6.5%) and prediabetes (5.7–6.4%).

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### CDC Diabetes Prevention Recognition Program (DPRP)

- CDC developed first set of national quality standards for the National DPP
- CDC DPRP officially launched

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**TRANSLATION STUDIES**

**TIMELINE: 2008-2013**

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<td>NDPP Curriculum&lt;br&gt; NDPP Curriculum</td>
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<tr>
<td>2012</td>
<td>NDPP Curriculum&lt;br&gt; 2012: DPPOS published 10-year follow-up to the DPP: long-term reduction of Type 2 DM risk among participants (34% lifestyle vs 18% metformin)</td>
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<tr>
<td>2013</td>
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</table>

Center for Medicare and Medicaid Innovation (CMMI) Project

- YMCA and CMMI partnered for a 3-year demonstration project to test the impact of the DPP in 8000 seniors through a Health Care Innovation Award

Adapted from Albright et al. “Prediabetes: Real World Implementation of the National Diabetes Prevention Program” and CDC. National Diabetes Prevention Program Coverage Toolkit [https://coveragetoolkit.org]
TIMELINE Diabetes Prevention Program

- **1996**: NIH initiates RCT of Lifestyle Program versus Metformin to decrease Type 2 DM incidence
- **2002**: Landmark RCT results published
- **2008 - 2012**: RCT Lifestyle vs Rx
- **2015 - 2016**: DPP Translation Studies
- **2015 - 2016**: Dissemination and Advocacy

Decrease in diabetes incidence (58% LCP vs 31% Rx) over 3 years
Prevent Diabetes STAT – Screen, Test, Act - Today
CDC and the American Medical Association partnered to launch the Prevent Diabetes STAT, “a guide to refer your patients with prediabetes to an evidence-based diabetes prevention program”

CDC DPRP Standards revised to allow virtual delivery

Medicaid Demonstration Project (Maryland and Oregon)

National Prediabetes Awareness Campaign

- The CDC, Ad Council, AMA, and American Diabetes Association launch a multi-year national prediabetes awareness campaign

HHS Secretary announced expansion of the NDPP into Medicare

TIMELINE Diabetes Prevention Program

Decrease in diabetes incidence (58% LCP vs 31% Rx) over 3 years

Landmark RCT results published

1996 RCT Lifestyle vs Rx

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2008 - 2012 DPP Translation Studies

2015 - 2016 Dissemination and Advocacy

2017 - 2018 Coverage
### COVERAGE

**TIMELINE: 2017-2018**

<table>
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<th>2017</th>
<th>2018</th>
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<tr>
<td>CDC NDPP tools and resources released</td>
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For use by states, employers, and insurers to calculate diabetes burden, estimate health and economic effects of the NDPP lifestyle change program and implement impact.

**DIABETES STATE BURDEN TOOLKIT**

Use this tool to understand the health, economic, and mortality burden of diabetes in your state. To get started, select your state from the drop down list or the map below and then choose one of the modules.

**DIABETES PREVENTION IMPACT TOOLKIT**

Use this Impact Toolkit to project the health and economic effects of the National DPP lifestyle change program on your population at risk for diabetes. For technical details on the Impact Toolkit and how to use it, or see the HELP page for a complete list of Impact Toolkit resources.

COVERAGE
TIMELINE: 2017-2018

2017

CMS rulemaking completed to establish the Medicare Diabetes Prevention Program

2018

NDPP lifestyle change program as a covered benefit for state and public employees in 12 states

Adapted from Albright et al. “Prediabetes: Real World Implementation of the National Diabetes Prevention Program” and CDC National Diabetes Prevention Program Coverage Toolkit. [https://coveragetoolkit.org/](https://coveragetoolkit.org/)
States where the National DPP is a State Employee Covered Benefit

Current as of 08/08/2018

https://coveragetoolkit.org/participating-payers/
COVERAGE

TIMELINE: 2017-2018

2017

Initial CDC-recognized organizations enroll as Medicare suppliers of the DPP

2018

CDC DPRP standards revised to align with CMS MDPP model expansion

OUTLINE/LEARNING OBJECTIVES

01 Background
• Review the timeline of the National Diabetes Prevention Program (NDPP).

02 Implementing the DPP
• Discuss considerations related to offering/implementing the DPP.

03 Referring to the DPP
• Discuss key steps and considerations related to referring to DPP Programs

04 Combinations of Offering & Referring to the DPP
• Explore examples of approaches that combined DPP implementation and DPP referral
DPP IMPLEMENTATION
CONSIDERATIONS
IMPLEMENTATION CONSIDERATIONS

1. Certification
2. Decreasing time between referral and enrollment
3. Participant/Class Retention
4. DPP Class Reimbursement
5. Engaging special populations/Addressing SDOH
1. Assures program quality, fidelity to scientific evidence and broad use of LCPs

2. Develop and maintain registry

3. Provide technical assistance to organizations
DPRP RESOURCES

GUIDANCE DOCUMENTS (APPENDICES)

A. Organizational Capacity Assessment

B. CDC Prediabetes Screening Test

C. Guidelines for Staff Eligibility, Roles, and Responsibilities; and Sample Position Descriptions

D. Description of the Data Submission and Evaluation Timeline with Examples

E. Using Data for Evaluation

F. DPRP Recommended Procedures for Measuring Weight

IS OFFERING THE DPP RIGHT FOR OUR ORGANIZATION?

ORGANIZATIONAL CAPACITY ASSESSMENT

CAPACITY TOPIC AREAS

1. DPRP Standards
2. Leadership & Staff Support
3. Staff
4. Staff Training
5. Evaluation Data Collection & Submission
6. Organization infrastructure
7. Eligible Participants
8. Recruitment and Enrollment
9. Sustainability
10. Tools and Resources

KEY STEP: STAFFING

Staffing Your Lifestyle Change Program

You will need staff to fill the following roles in your lifestyle change program:

- **Lifestyle coach** to lead the lifestyle change program sessions and support and encourage participants
- **Program coordinator** to oversee daily operations of the lifestyle change program, support and guide lifestyle coaches, and ensure that the program meets quality performance outcomes
- **Data preparer** to collect and submit data to CDC.

In large programs that serve many participants, each of these roles is typically filled by a different person. Some large programs even have more than one coach and coordinator. In smaller programs, one person may fill all three roles.

Consider identifying individuals already in your organization, or affiliated with it, who would be well-suited for these positions.

The 2018 [CDC Recognition Program Standards and Operating Procedures](https://www.cdc.gov/diabetes/prevention/lifestyle-program/staffing-training.html) offer position descriptions for lifestyle coaches and program coordinators, which outline desired skills and qualifications. You can use these position descriptions to recruit program staff, if needed.
KEY STEP: STAFF TRAINING
LIFESTYLE CHANGE PROGRAM AND MASTER TRAINING

Training for Your Lifestyle Coaches

CDC-recognized lifestyle change programs must have lifestyle coaches who are trained to use a CDC-approved curriculum and have the knowledge and skills to effectively deliver the program. The lifestyle coach's ability to support participants, provide guidance, and help groups work together effectively is essential for a successful lifestyle change program.

If your organization needs training for your lifestyle coaches, the organizations listed below can help. They have signed a memorandum of understanding (MOU) with CDC to provide training. Some of them can also provide training for Master Trainers, who can, in turn, train lifestyle coaches in their own and partner organizations. There are thousands of trained lifestyle coaches nationwide.


Lifestyle Coach and Master Training Organizations:

- American Association of Diabetes Educators, Diabetes Prevention Program
- Black Women’s Health Imperative
- Center for Excellence in Aging & Community Wellness/Quality and Technical Assistance Center (QTAC)
- Diabetes Training and Technical Assistance Center, The Emory Centers for Training and Technical Assistance at Emory University
- Magnolia Medical Foundation
- Solaris Health Inc
- State of Wellness
- Innovative Wellness Solutions
- Virginia Center for Diabetes Prevention & Education

Lifestyle change coaches are trained to use a CDC-approved curriculum and have the knowledge and skills needed to effectively deliver the program.
IMPLEMENTATION CONSIDERATIONS

1. Certification
2. Decreasing time between referral and enrollment
3. Participant/Class Retention
4. DPP Class Reimbursement
5. Engaging special populations/Addressing SDOH
## Decreasing Time Between Referral and Enrollment

### Challenge/Why is it Important?

- **Enrollment**: Patients who started **within 2 months of the referral date** were enrolled more often (54.4%) than patients who waited 4 or more months (21%) (Chambers 2017)

- **Attendance**: A short interval between referral to scheduling was a strong predictor of whether a patient attended 3 or more classes (Rehm 2017) (YMCA-Montefiore Health System partnership)

### Ways to Improve/Possible Solutions

1. Flexible staffing model that allow for ongoing engagement with referred patients (Rehm 2017)
2. Training additional health staff as DPP coaches (Rehm 2017)
3. Dedicated staff persons (clinical and social work) (Carroll 2015)
4. Increase number of sessions (times and locations) (Chambers 2017)
5. INVOLVE OTHER OTHER HEALTH PROFESSIONALS

Power of Prevention: The Pharmacist’s Role in Prediabetes Management
Brooke D. Hudspeth

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 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).
NDPP THROUGH OTHER HEALTH PROFESSIONALS

PHARMACISTS

➢ **Expertise and track record in prevention:** PharmDs already in healthcare teams of patient-centered medical homes, providing immunizations, ensuring medication adherence, and assisting in tobacco cessation

➢ **Ubiquitous and local:** 67,000 community pharmacies in the United states with food-store pharmacies comprising 10% of community pharmacies

➢ **Frequent contact with patients:** Millions visit a community pharmacy weekly and pharmacists have multiple daily encounters with individuals at risk for type 2 diabetes

➢ **Expertise in handling personal health information**
6. NDPP DIGITAL DELIVERY

Digital Health–Supported Lifestyle Change Programs to Prevent Type 2 Diabetes

Kate Kirley and Neha Sachdev

IN BRIEF Type 2 diabetes can be prevented or delayed in people with prediabetes through participation in an intensive lifestyle change program (LCP), particularly one based on the Diabetes Prevention Program research study. Digital health offers opportunities to extend the reach of such LCPs and possibly improve on these programs, which traditionally have been delivered in person. In this review, we describe the current state of evidence regarding digital health–supported LCPs and discuss gaps in research and opportunities for future efforts.

The United States is confronting a type 2 diabetes epidemic; over 30 million Americans have diabetes, about 95% of whom have type 2 diabetes (1). The prevalence of type intensive lifestyle change program (LCP) modeled after the Diabetes Prevention Program (DPP) research study (8). Briefly, the DPP randomized, controlled trial (RCT) included
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<th>Potential Digital Delivery Modes</th>
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<td>• Group chat</td>
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*Standard delivery modes are nondigital modes of delivery. LCPs that are considered “in person” typically deliver most forms of the program via the standard mode but may deliver some components of the program digitally.
TWO CDC-RECOGNIZED COMPREHENSIVE DIGITAL DPP PROVIDERS

- Omada Health Inc and Noom
  - Asynchronous curriculum
  - Digital self-monitoring tools (e.g. smart scales and wearables)
  - Personalized health coaching and group support via messaging

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### NDPP Digital Delivery

**Comprehensive Digital Programs Evidence**

**OMADA HEALTH INC**
- 3-year single arm trial: 4.7% avg weight loss at 1 year and 3% at 3 years
- Single-arm retrospective analysis of 500 Medicare-age adults with prediabetes/metabolic syndrome: mean 7.5% weight loss at 1 year for 86% of participants

**NOOM**
- Pilot study of 43 employees: 83% completed the program; 7.5% body weight loss at 6 months

### Gaps in evidence and implementation:
- Program effectiveness and implementation best practices in priority populations
- Guidance for clinicians seeking to determine the best patient-type of NDPP match.

### Table 1. LCP Components Delivered in Person or via Digital Health

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*Standard delivery modes are nondigital modes of delivery. LCPs can theoretically deliver most components of the program through standard modes by time.

Kirley and Sachdev 2018. Digital Health–Supported Lifestyle Change Programs to Prevent Type 2 Diabetes [https://doi.org/10.2337/ds18-0019](https://doi.org/10.2337/ds18-0019)
IMPLEMENTATION CONSIDERATIONS

1. Certification
2. Decreasing time between referral and enrollment
3. Participant/Class Retention
4. DPP Class Reimbursement
5. Engaging special populations/Addressing SDOH
A National Effort to Prevent Type 2 Diabetes: Participant-Level Evaluation of CDC’s National Diabetes Prevention Program

Diabetes Care 2017;40:1331–1341 | DOI: https://doi.org/10.2337/dc16-2099

OBJECTIVE
To assess participant-level results from the first 4 years of implementation of the National Diabetes Prevention Program (National DPP), a national effort to prevent type 2 diabetes in those at risk through structured lifestyle change programs.

RESEARCH DESIGN AND METHODS
Descriptive analysis was performed on data from 14,747 adults enrolled in year-long type 2 diabetes prevention programs during the period February 2012 through January 2016. Data on attendance, weight, and physical activity minutes were summarized and predictors of weight loss were examined using a mixed linear model. All
PARTICIPANT RETENTION

WHY IS IT IMPORTANT?

➢ Participant-level results from the first 4 years of NDPP implementation

➢ Median weight loss of ≥5% weight loss was generally achieved by participants who attended at least 17 sessions

➢ Median weight loss: 6% (≥ 17 sessions attended and remained in the program in months 7-12) versus 1.9% (2-16 sessions attended and remained in the program months 1-6 only)

➢ Median physical activity minutes increased with number of sessions attended

➢ Those attending ≥18 sessions generally achieved the physical activity goal of 150 minutes per week
PARTICIPANT RETENTION

WAYS TO IMPROVE/POSSIBLE SOLUTIONS

1. Use EHR to capture patient barriers to enrollment and attendance in structured data fields (Rehm 2017)

2. Assess the impact of incentives (Rehm 2017)

3. Dedicated team member focused on retention with adequate allotted time (Carroll 2015)

4. Proactive plan to address transportation (Carroll 2015)
Presessions to the National Diabetes Prevention Program May be a Promising Strategy to Improve Attendance and Weight Loss Outcomes

Natalie D. Ritchie, PhD$^{1,2,}\odot$, Peter G. Kaufmann, PhD$^{3}$, R. Mark Gritz, PhD$^{4}$, Katherine A. Sauder, PhD$^{5}$, and Jodi Summers Holtrop, PhD, MCHES$^{6}$

Abstract

**Purpose:** The National Diabetes Prevention Program (NDPP) is a widely disseminated lifestyle intervention. Attendance is problematic, leading to suboptimal weight loss, especially among racial/ethnic minority participants. We conducted a novel "presession" protocol to improve engagement of diverse NDPP candidates, comparing NDPP participants who attended a presession to those who did not on attendance and weight loss outcomes.

**Design:** Longitudinal cohort study.

**Setting:** A safety net health-care system.

**Participants:** A total of 1140 patients with diabetes risks (58.9% Hispanic, 19.8% non-Hispanic black, 61.8% low income).

**Intervention:** The NDPP has been delivered in a Denver, Colorado health-care system since 2013. The program included 22 to 25 sessions over 1 year. Beginning September 2016, individuals were required to attend a presession before enrollment that focused on (1) increasing risk awareness, (2) motivational interviewing to participate in the NDPP, and (3) problem-solving around engagement barriers.
5. PRESESSIONS/INFO SESSIONS

➢ Setting: Safety net health-care system providing the NDPP

➢ “Presessions”: 1-hour Group-based meetings led by NDPP coaches held 1 to 3 weeks prior to new NDPP classes, focused on (1) education on diabetes risks, (2) motivational interviewing to participate in the NDPP, and (3) problem-solving around barriers to engagement.

➢ Higher attendance: Presession participants attended more sessions (49.3% vs 35.0%; P < .001) and stayed in the program longer (196.3 vs 96.5 days; P < .001) on average than participants who were not offered a presession.

➢ Greater weight loss: Presession participants achieved more weight loss (3.4% vs 1.5%; P < .001) and were over 3 times more likely to achieve ≥5% weight loss (odds ratio 3.5, P < .001, 95% confidence interval [2.1-6.1]).
POSSIBLE REASONS WHY PRESESSIONS IMPROVE NDPP OUTCOMES

- increasing perceived risk
- enhancing readiness for change and self-efficacy
- helping to cope with potential barriers
- Screening/identifying highly motivated individuals, thereby improving program efficiency.

Abstract

Purpose: The National Diabetes Prevention Program (NDPP) is a widely disseminated lifestyle intervention. Attendance is problematic, leading to suboptimal weight loss, especially among racial/ethnic minority participants. We conducted a novel “presession” protocol to improve engagement of diverse NDPP candidates, comparing NDPP participants who attended a presession to those who did not on attendance and weight loss outcomes.

Design: Longitudinal cohort study

Setting: A safety-net health-care system.

Participants: A total of 1,440 patients with diabetes risk (58.9% Hispanic, 19.8% non-Hispanic black, 61.8% low income).

Intervention: The NDPP has been delivered in a Denver, Colorado health-care system since 2013. The program included 22 to 25 sessions over 16 weeks. Beginning October 2016, individuals were provided access to a presession, before enrollment that focused on attendance strategies.
Nudging to Change: Using Behavioral Economics Theory to Move People and Their Health Care Partners Toward Effective Type 2 Diabetes Prevention

Robin E. Soler, Krista Proia, Matthew C. Jackson, Andrew Lanza, Cynthia Klein, Jessica Leifer, and Matthew Darling

IN BRIEF  In 2017, 30 million Americans had diabetes, and 84 million had prediabetes. In this article, the authors focus on the journey people at risk for type 2 diabetes take when they become fully engaged in an evidence-based type 2 diabetes prevention program. They highlight potential drop-off points along the journey, using behavioral economics theory to provide possible reasons for most of the drop-off points, and propose solutions to move people toward making healthy decisions.

\[ \text{In 2017, } 30 \text{ million Americans had diabetes. The total estimated direct and indirect costs of diagnosed diabetes in the United States was estimated at } \$327 \text{ billion (1). In addition, 84 million Americans had prediabetes, a condition in which blood glucose levels are higher than normal but not high enough for a diabetes diagnosis (2). Prediabetes is reversible and, if addressed properly, evidence-based interventions for preventing, delaying, or managing type 2 diabetes largely focus on long-term, achievable behavior changes (9–15). Such lifestyle changes may seem overwhelming to individuals for many reasons, including what some call an “obesogenic environment” in which consumers are surrounded by external stimuli making healthy choices difficult (16).} \]
PARTICIPANT RETENTION
A COMPLEX, COMPLICATED PROCESS

Key
- Potential point of entry
- Key customer action/desired outcome
- Consumer action
- Behavioral determinant
- Potential drop-off point
- Key point of influence

ENROLLMENT IN TYPE 2 PREVENTION PROGRAM
IMPLEMENTATION CONSIDERATIONS

1. Certification
2. Decreasing time between referral and enrollment
3. Participant/Class Retention
4. DPP Class Reimbursement
5. Engaging special populations/Addressing SDOH
NDPP outcomes are disparate for racial/ethnic minority participants and low-income non-Hispanic whites (Ely 2017, Ritchie 2018a, Ritchie 2018b)

** CMS noted that they “may consider proposing additional payment policies for the MDPP expanded model in the future” (Ritchie 2018c)

Opportunity for the Quadruple Aim/ensure access and sustainability (Ritchie 2018c)

WAYS TO IMPROVE/POSSIBLE SOLUTIONS

1. Create in-house reimbursement for patients in risk-based and/or capitated contracts (Rehm 2017)

2. Revise payment methodology to account for social risk factors and demographic differences in outcomes (risk adjusted model) and offer higher performance-based payments to help eliminate disparities (Ritchie 2018)

3. Analyze, document, and disseminate the costs associated with DPP implementation and to advocate for appropriate reimbursement (Parsons 2018)
IMPLEMENTATION CONSIDERATIONS

1. Certification
2. Decreasing time between referral and enrollment
3. Participant/Class Retention
4. DPP Class Reimbursement
5. Engaging special populations/Addressing SDOH
1. NDPP OUTCOMES DISPARITIES
NON-HISPANIC WHITES BY INCOME STATUS

Rethinking the National Diabetes Prevention Program for Low-Income Whites

Natalie D. Ritchie,¹,²
Katherine A. Sauder,³
Phoutavone Phimphasone-Brady,⁴
and Claudia R. Amura⁵

Diabetes Care 2018;41:e56–e57 | https://doi.org/10.2337/dc17-2230

Table 1—Adjusted percent weight loss by race/ethnicity and income in the NDPP, N = 994

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<thead>
<tr>
<th>Race/Ethnicity</th>
<th>All participants</th>
<th>Active but not completing participants†</th>
<th>Completing participants‡</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Weight loss</td>
<td>P value</td>
</tr>
<tr>
<td>NHW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low income</td>
<td>106</td>
<td>1.21 (0.38)</td>
<td>0.007</td>
</tr>
<tr>
<td>Not low income</td>
<td>102</td>
<td>2.66 (0.38)</td>
<td>–</td>
</tr>
<tr>
<td>Hispanic and NHB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low income</td>
<td>507</td>
<td>1.52 (0.18)</td>
<td>0.945</td>
</tr>
<tr>
<td>Not low income</td>
<td>279</td>
<td>1.54 (0.24)</td>
<td>–</td>
</tr>
</tbody>
</table>

Data are presented as percent weight loss mean (SE) based on modified population marginal means, unless otherwise indicated. Models include attendance, income, race/ethnicity (NHW vs. Hispanic and NHB), and race/ethnicity*income. Neither age (P = 0.973), sex (P = 0.675), nor baseline BMI (P = 0.810) were significant predictors and were removed from final models. Boldface type indicates statistical significance in adjusted percent weight loss within racial/ethnic groups by income level (P < 0.05). †Active participants attended ≥4 sessions in months 1–6 but did not complete the program. ‡Completing participants attended ≥9 and ≥3 sessions in months 1–6 and 7–12, respectively, per CDC guidelines (3).

NHWs NDPP completed: low-income participants achieved only 25% of the weight loss of their higher-income counterparts’
2. PREDIABETES AND FOOD INSECURITY/SDOH

Trends in Food Insecurity in the USA for Individuals with Prediabetes, Undiagnosed Diabetes, and Diagnosed Diabetes

Rebekah J. Walker, PhD1,2, Jessica Grusnick, PA-C1,2, Emma Garacci, MS1,2, Carlos Mendez, MD1,3, and Leonard E. Egede, MD, MS1,2

Table 1: Multivariable Logistic Regression Estimates for Food Insecurity by Diabetes Status

<table>
<thead>
<tr>
<th>Diabetes status</th>
<th>Crude odds ratio OR (95% CI)</th>
<th>p value</th>
<th>Adjusted odds ratio OR (95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prediabetes</td>
<td>1.15 (1.01–1.31)</td>
<td>0.0003</td>
<td>1.39 (1.21–1.59)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Undiagnosed diabetes</td>
<td>1.61 (1.26–2.07)</td>
<td></td>
<td>1.81 (1.37–2.38)</td>
<td></td>
</tr>
<tr>
<td>Diagnosed diabetes</td>
<td>1.23 (1.04–1.46)</td>
<td></td>
<td>1.58 (1.29–1.93)</td>
<td></td>
</tr>
</tbody>
</table>

Survey year

<table>
<thead>
<tr>
<th>Survey year</th>
<th>Reference</th>
<th>Reference</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005–2006</td>
<td>1.22 (0.96–1.57)</td>
<td>1.09 (0.87–1.38)</td>
<td>0.0006</td>
</tr>
<tr>
<td>2007–2008</td>
<td>1.52 (1.22–1.89)</td>
<td>1.38 (1.12–1.70)</td>
<td></td>
</tr>
<tr>
<td>2009–2010</td>
<td>1.77 (1.35–2.31)</td>
<td>1.51 (1.20–1.90)</td>
<td></td>
</tr>
<tr>
<td>2011–2012</td>
<td>1.68 (1.33–2.13)</td>
<td>1.55 (1.23–1.96)</td>
<td></td>
</tr>
</tbody>
</table>

*Adjusted models include gender, age, race, education level, marital status, ratio of family income to poverty level, and survey year

NHANES 2005-2014: Those with prediabetes were 39% more likely to be food insecure than individuals without diabetes

Walker et al 2018 DOI: 10.1007/s11606-018-4651-z
Associations between food insecurity and prediabetes in a representative sample of U.S. Adults (NHANES 2005–2014)

Lauri Wright\textsuperscript{a,}*, Sericea Stallings-Smith\textsuperscript{b}, Andrea Y. Arikawa\textsuperscript{a}

Table 2 – Adjusted Odds Ratios (aOR) for the association between food insecurity and laboratory-confirmed prediabetes, ages ≥20 years in the National Health and Nutrition Examination Survey (NHANES), 2005–2014.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Prediabetes aOR (95% CI)</th>
<th>Full/marginal food security</th>
<th>Low/very low food security</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>1.00</td>
<td>1.35 (1.17–1.55)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20–34 years</td>
<td>1.00</td>
<td>1.50 (1.19–1.91)</td>
<td></td>
</tr>
<tr>
<td>35–44 years</td>
<td>1.00</td>
<td>1.42 (1.12–1.79)</td>
<td></td>
</tr>
<tr>
<td>45–54 years</td>
<td>1.00</td>
<td>1.45 (1.15–1.83)</td>
<td></td>
</tr>
<tr>
<td>55–64 years</td>
<td>1.00</td>
<td>1.10 (0.84–1.44)</td>
<td></td>
</tr>
<tr>
<td>≥65 years</td>
<td>1.00</td>
<td>1.11 (0.85–1.45)</td>
<td></td>
</tr>
</tbody>
</table>

NHANES 2005-2014: Compared to participants with full/marginal food security, participants with low/very low food security were 1.35 times more likely to have prediabetes

Walker et al 2018 DOI: 10.1007/s11606-018-4651-z
WAYS TO IMPROVE/POSSIBLE SOLUTIONS

1. Cultural tailoring (Chambers 2017, Ritchie 2018)

2. Identify/Screen for diabetes and prediabetes in areas with high food insecurity (Seligman 2018, Wright 2018)

3. Partner with hospital systems and other organizations to increase access to resources like food banks and recreation centers (Ritchie 2018, Wright 2018)

4. Low-income adaptations of the NDPP should be developed and tested, e.g. nutrition label reading and skills-based training in food preparation on a budget (Polak 2018, Ritchie 2018, Walker 2018)
Preventing Type 2 Diabetes with Home Cooking: Current Evidence and Future Potential

Rani Polak\textsuperscript{1,2} · Amir Tirosh\textsuperscript{3} · Barbara Livingston\textsuperscript{4} · David Pober\textsuperscript{5} · James E. Eubanks Jr\textsuperscript{6} · Julie K. Silver\textsuperscript{7,8,9} · Kaya Minezaki\textsuperscript{10} · Roni Loten\textsuperscript{11,12} · Edward M. Phillips\textsuperscript{1,8,9,13}

Published online: 14 September 2018
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Abstract

Purpose of Review Various dietary regimes have proven effective in preventing diabetes, yet its prevalence is growing. This review’s goals are to examine the relationship between home cooking and diabetes and to present the literature on home cooking education programs as a novel strategy to improve adherence to healthy nutrition, thus decreasing the risk of diabetes.

Recent Findings Consumption of home-cooked food is linked to healthier nutrition and decreased risk of diabetes. Further, home cooking interventions have a short-term positive impact on nutritional intake of both children and adults, and on diabetes prevention. Well-designed randomized controlled studies are needed to rigorously evaluate the long-term impact of home cooking interventions on cooking behavior, dietary intake, diabetes, and healthcare costs.

Summary Culinary education is an emerging field that aims to change nutrition education paradigms. Clinicians can empower patients to adopt home cooking by role modeling home cooking themselves, including home cooking content in their medical encounters, and through comprehensive lifestyle medicine interventions.
<table>
<thead>
<tr>
<th>OUTLINE/LEARNING OBJECTIVES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>01 Background</strong></td>
</tr>
<tr>
<td>- Review the timeline of the National Diabetes Prevention Program (NDPP).</td>
</tr>
<tr>
<td><strong>02 Implementing the DPP</strong></td>
</tr>
<tr>
<td>- Discuss considerations related to offering/implementing the DPP.</td>
</tr>
<tr>
<td><strong>03 Referring to the DPP</strong></td>
</tr>
<tr>
<td>- Discuss key steps and considerations related to referring to DPP Programs</td>
</tr>
<tr>
<td><strong>04 Combinations of Offering &amp; Referring to the DPP</strong></td>
</tr>
<tr>
<td>- Explore examples of approaches that combined DPP implementation and DPP referral</td>
</tr>
</tbody>
</table>
DPP REFERRAL

KEY STEPS AND OTHER CONSIDERATIONS
Practical Tips for Implementing the Diabetes Prevention Program in Clinical Practice

Carolyn Bradner Jasik 1,2 · Elizabeth Joy 3,4 · Kimberly D. Brunisholz 5,6 · Katherine Kirley 7

Published online: 8 August 2018
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Abstract
Purpose of Review The Diabetes Prevention Program (DPP) is an evidence-based lifestyle change program for prediabetes that is associated with a 58% reduction in 3-year diabetes incidence, and it has been supported by the American Medical Association and the Centers for Disease Control and Prevention. However, 9 in 10 patients are unaware they have the condition.
Recent Findings With the passage of the Affordable Care Act (ACA) and broadened coverage for preventive services, the DPP has emerged as an accessible intervention in patients at risk. In 2018, Medicare began to cover the DPP, making it widely available for the first time to any patient over the age of 65 meeting eligibility criteria.
Summary The DPP is an evidence-based, widely available, frequently covered benefit, for lifestyle change for patients with prediabetes. To take advantage of this intervention, providers need to develop prediabetes screening and DPP referral workflows.

Keywords Prediabetes · Obesity · DPP · Prevention · Lifestyle
1. Identify a clinical champion, engage organizational leadership as appropriate, and form a working group

From Triple to Quadruple Aim: Care of the Patient Requires Care of the Provider

Thomas Bodenheimer, MD
Christine Sinsky, MD

1Center for Excellence in Primary Care, Department of Family and Community Medicine, University of California San Francisco, San Francisco, California
2Medical Associates Clinic and Health Plan, Dubuque, Iowa
3American Medical Association, Chicago, Illinois

ABSTRACT

The Triple Aim—enhancing patient experience, improving population health, and reducing costs—is widely accepted as a compass to optimize health system performance. Yet physicians and other members of the health care workforce report widespread burnout and dissatisfaction. Burnout is associated with lower patient satisfaction, reduced health outcomes, and it may increase costs. Burnout thus imperils the Triple Aim. This article recommends that the Triple Aim be expanded to a Quadruple Aim, adding the goal of improving the work life of health care providers, including clinicians and staff.


INTRODUCTION

Since Don Berwick and colleagues introduced the Triple Aim into the health care lexicon, this concept has spread to all corners of the health care system. The Triple Aim is an approach to optimizing health system performance, proposing that health care institutions simultaneously pursue 3 dimensions of performance: improving the health of populations, enhancing the patient experience of care, and reducing the per capita cost of health care.1 The primary ‘Triple Aim’ goal is to improve the health of the population, with 2 secondary goals—improving patient experience and reducing costs—contributing to the achievement of the primary goal.

In visiting primary care practices around the country,2 the authors have repeatedly heard statements such as, “We have adopted the Triple Aim as our framework, but the stressful work life of our clinicians and staff impacts our ability to achieve the 3 aims.” These sentiments made us wonder, might there be a fourth aim—improving the work life of health care clinicians and staff—that, like the patient experience and cost reduction aims, must be achieved in order to succeed in improving population health? Should the Triple Aim become the Quadruple Aim?
CLINICAL PROTOCOL FOR SCREENING

1. Identify a clinical champion, engage organizational leadership as appropriate, and form a working group

2. Create a clinical protocol for screening and referrals

**CLINICAL PROTOCOL FOR SCREENING AND REFERRAL OPTIONS**

**DPP Referral: Key Step #2**

**LEVERAGE EHR OR POP HEALTH DATA**

**Retrospective prediabetes identification**

- Check EHR at patient's next visit using the following criteria:
  - Age 12 years old and above
  - Presence of one (1) of the following conditions:
    - History of gestational diabetes (ICD-9: 648.81, ICD-10: O96.32)
    - Family history of diabetes (ICD-9: 250.x, ICD-10: E10-14)
    - Current or past smoker

**REFERRALS DURING CLINIC VISITS**

**Point-of-care prediabetes identification**

- Review fasting blood glucose level at the next clinic visit (ICD-9: 648.81, ICD-10: O96.32)
- Inform patient of the risk and potential for prediabetes
- Referral criteria:
  - Fasting plasma glucose ≥ 100 mg/dL and < 126 mg/dL
  - 2-hour post-meal plasma glucose ≥ 140 mg/dL and < 200 mg/dL

COMBINATION APPROACH
~ RETROSPECTIVE + POINT-OF-CARE: PRE-VISIT PLANNING

Retrospective prediabetes identification

- Query HbA1c or patient database every 6-12 months using the following criteria:
  - A1c ≥ 5.7% and < 6.5%
  - A previous A1c test within the previous 12 months
  - Fasting glucose ≥ 100 mg/dL
  - History of gestational diabetes (GDM) or history of diabetes
  - Current diagnosis of diabetes (GDM, pre-diabetes, type 2 diabetes, and type 1 diabetes)
  - Current insulin use
- Generate list of patient names with screening information

ACT
- Use the patient list:
  - A1c cut-off to inform of initiation, diagnosis, and share info on diabetes prevention programs, w/coach
  - Small problem info to diabetes prevention program
  - Program coordinator will contact patient directly, w/coach
  - Referral to primary care provider for patient record
- Pay medical record for patient record office visit

Point-of-care prediabetes identification

DPP Referral:
Key Step #2
Another workflow option

- Key Step #2: DPP Referral
- Another workflow option

COMBINATION APPROACH

UTILIZING OUR PRACTICE TOOL: PREVISIT PLANNING FORM

*Web-based previsit planning form
COMBINATION APPROACH

UTILIZING OUR PRACTICE TOOL: PREVISIT PLANNING FORM

*Web-based previsit planning form*
## PROVIDER SCREENING AND REFERRAL OF PATIENTS FOR PREDIABETES

<table>
<thead>
<tr>
<th>Author/Year</th>
<th># of Providers or Patients</th>
<th>% screened patients for prediabetes using a risk test</th>
<th>% patients referred to a DPP or % providers who made DPP referrals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schmittdiel 2014</td>
<td>368,053 patients with incident prediabetes</td>
<td>-</td>
<td>&lt;5%</td>
</tr>
<tr>
<td>Tseng 2017</td>
<td>155 Primary Care Providers**</td>
<td>-</td>
<td>11%</td>
</tr>
<tr>
<td>Nhim 2018</td>
<td>1,256 Primary Care Providers</td>
<td>27%</td>
<td>23%</td>
</tr>
</tbody>
</table>

** 6% correctly identified the risk factors for prediabetes
17% correctly identified the prediabetes diagnostic criteria (FBG & HbA1c)
90% reported close follow-up of patients with prediabetes
CLOSED-LOOP REFERRAL

DPP Referral Key Step 2 Solution/Best Practice

Closed-looped referral: Regular updates about the status of their patients in the DPP would be an important lever for ensuring future referrals from PCPs (Rehm 2017, Colorado DPH, Oregon Health Authority)

DPP Providers

Refer Patients & nurture partnership

DPP Curriculum

Logging, Regular Physical Activity, & healthy nutrition

Primary Care Providers (PCPs)

Provide feedback

Encourage/Reinforce lifestyle change and progress during PCP visits

Periodic patient updates to referring providers

Patients and the Community

Adapted from Griffin Hospital Center for Prevention and Lifestyle Management Figure; Ritchie 2016; Colorado Department of Public Health & Environment 2015; Rehm 2017; Oregon Health Authority 2018; Jasik 2018
CLOSED-LOOP REFERRAL

Collaborative approach: Traditional doctor-patient treatment model is augmented by other professionals. PCPs help establish and reinforce patient participation in NDPP as a treatment priority. (Ritchie 2016)

Periodic patient updates to referring providers

Refer Patients & nurture partnership

Provide feedback

Encourage/Reinforce lifestyle change and progress during PCP visits

Logging, Regular Physical Activity, & healthy nutrition

Adapted from Griffin Hospital Center for Prevention and Lifestyle Management Figure; Ritchie 2016; Colorado Department of Public Health & Environment 2015; Rehm 2017; Oregon Health Authority 2018; Jasik 2018
50% OF PEOPLE REFERRED BY PRIMARY CARE ENROLL IN THE DPP

Compared to 10% enrollment among those who did not have a PCP referral.

1. Identify a clinical champion, engage organizational leadership as appropriate, and form a working group

2. Create a clinical protocol for screening and referrals

3. Find a local DPP for referral
   • Clarify insurance options
   • Review data exchange for referrals and patient progress
KEY STEPS FOR DPP REFERRALS

Table 3  Characteristics of best-in-class DPP programs

- CDC-recognized*
- No copayment and covered by insurance
- Curriculum and programming adapted for diverse populations
- Offers patient choice between virtual and in-person
- Published peer-reviewed studies ensure more reliable outcomes (especially for virtual)
- Value-based pricing
- Demonstrated positive impact on health care utilization (via claims analysis)
- Easy to use and implement
- Ability to integrate into clinical workflows

*Check here for programs: https://ncdf.cdc.gov/ddt_dprp/registry.aspx

1. Identify a clinical champion, engage organizational leadership as appropriate, and form a working group

2. Create a clinical protocol for screening and referrals

3. Find a local DPP for referral
   - Clarify insurance options
   - Review data exchange for referrals and patient progress

4. Engage clinical staff through education
   - Define roles and responsibilities in the workflow
   - Conduct trainings and provide DPP reference information

DPP Referral: Engage Clinical Staff through education

REFERENCE SHEET FOR STAFF/PROVIDERS

➢ Determine cost for patients depending on insurance status
➢ Utilize in-house HbA1c system

Costales, V.C.

Prediabetes Screening/Diabetes Prevention Program (DPP) Demonstration Project Reference Sheet

Background on the Diabetes Prevention Program (DPP)
- Griffin offers a CDC-recognized Diabetes Prevention Program (DPP) for all patients with prediabetes
- The DPP is a lifestyle change program comprised of one-hour weekly sessions for 6 months followed by 1-2x per month support group meetings for another 6 months (see reverse page for topics covered at the DPP).
- Program Fee: $0
- The DPP is designed to help patients reduce their body weight by 5-7% and increase physical activity to 150 minutes per week
- Evidence: Compared to taking metformin 850 mg twice a day, the DPP lifestyle program reduced new cases of diabetes by 58% and by 71% among patients over 60 years old

Goals of the Diabetes Prevention Program Demonstration Project
- Identify all patients at risk for diabetes through a standardized process, which maximizes patient identification and minimizes provider time assessing a patient’s need for diabetes screening
- For patients identified with prediabetes (HbA1c 5.7-6.4%), providers discuss referral to our free CDC-recognized, effective Diabetes Prevention Program (DPP)

Criteria for Screening (Pre-visit Planning [PVP] form will identify patients at risk for diabetes)
- 45 years old OR BMI greater than 25 (Asians American BMI 23 or greater) AND one or more of the following:
  - First-degree relative with Diabetes (Atherogenic family history DM)
  - High Risk Ethnicity (African American, Latino/Hispanic, Alaskan Native, Asian American, Pacific Islander)
  - Females with history of gestational diabetes
  - History of heart disease
  - Diagnosis of Hypertension
  - HDL cholesterol less than 35mg/dL and/or Triglycerides level greater than 250mg/dL
  - Females with Polycystic Ovarian Syndrome (PCOS)

Process
- For patients that need prediabetes screening: If the above criteria for screening is met, a line will populate on the PVP form to do a screening HbA1c, indicating type of insurance of the patient and reminder of what ICD-10 code to use (Insurance type): Use “Screen for diabetes”: ICD-10 code E13.1
- Providers and staff can refer to this sheet for patient co-pay information and DPP topics (reverse page)
- Testing Frequency: Screening will only flag once per calendar year
- During the huddle, the PVP will be reviewed with the PCP and MA, patients identified for screening will be discussed
- MA will complete the HbA1c on identified patients (In-house HbA1c procedure code 83035GW)
- PCPs will review the results; for patients with HbA1c 5.7-6.4%, PCPs discuss DPP referral
- DPP referral: Search for “CPUL” or “prediabetes” in the diagnoses & orders section
- For patients with HbA1c between 5.7-6.4 before the visit: PVP will flag “Has HbA1c in the prediabetes range. Referral to the DPP” (link to www.acpm.org)

<table>
<thead>
<tr>
<th>Patient Insurance Type and Co-Pay</th>
<th>Co-Pay</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicare $0</td>
<td>$15.52</td>
</tr>
<tr>
<td>Medicaid $0</td>
<td>CT Care: $0</td>
</tr>
<tr>
<td>Aetna $8.75-$15.00</td>
<td>United Health Care: $36 out pocket on any lab, once met no cost</td>
</tr>
</tbody>
</table>

Cigna $15.52
KEY STEPS FOR DPP REFERRALS

5. Develop outreach materials (handouts and referral cards)

6. Choose a “go-live” date and collect implementation and health outcomes data to assess progress.

Background
- Review the Diabetes Prevention Program thus far/where we stand as of early 2019.

DPP: Offer/Implement
- Discuss considerations related to offering/implementing the DPP (barriers, what works/facilitators, and other considerations)

DPP: Refer
- Discuss considerations related to referring to DPP Programs (barriers, what works/facilitators, and other considerations)

Refer and Offer Combination
Explore examples of approaches that combined DPP implementation and DPP referral (advantages/opportunities)
DPP OFFER AND REFER
COMBINATION APPROACHES
EXAMPLES
Combination Approaches: Montefiore and YMCA
Increase Referrals from Health Care Providers

CDC works with numerous partners to help identify and refer at-risk individuals to CDC-recognized diabetes prevention programs. Examples include:

**American College of Preventive Medicine**
Partnership with the ACPM to increase health care provider screening/testing/referrals through training, developing local champions, and testing and evaluating approaches in the field.

https://www.acpm.org/dpp

**State Grantees**
Partnership with state health departments to work with local health care organizations to develop referral protocols/policies/systems.

**American Medical Association**
Partnership with AMA to increase health care provider screening/testing/referrals by engaging and activating state medical societies.

**Y-USA**
Partnership with the Y-USA to explore bi-directional e-referral models for use by health care systems and CDC-recognized diabetes prevention programs to screen and refer people at high risk for type 2 diabetes (retrospectively or at point of contact).

A. HIGH LEVEL PROCESSES

**Screening**
- Incorporate Prediabetes screening criteria in the Previsit Planning Form

**Testing**
- Test HbA1c during the visit

**Referral**
- Utilize Electronic Medical Record (EMR)

**Awareness**
- Train and support Providers/Staff
- Educate and inspire patients and the community

*Goal: Quadruple Aim*
CENTER FOR PREVENTION AND LIFESTYLE MANAGEMENT (CPLM)

- Umbrella for all the prevention, lifestyle and wellness initiatives of Griffin Hospital
- 2016-2018: Academic Administrative Unit of the Department of Preventive Medicine
- HRSA Funding (Integrative Medicine and Population health)

Griffin Hospital Lifestyle Programs

Providers/GFP & Community PCPs

Patients and Families (our community)
WHAT WE ARE ALL INVOLVED IN..

Groups in the National Diabetes Prevention Program are working to:

- Build a workforce that can implement the lifestyle change program effectively
- Ensure quality and standardized reporting
- Deliver the lifestyle change program through organizations nationwide
- Increase referrals to and participation in the lifestyle change program

BECAUSE WE KNOW WHAT’S AT STAKE..

THE GROWING THREAT OF PREDIABETES

Prediabetes is identified when your blood sugar level is higher than normal but not high enough yet to be diagnosed as type 2 diabetes.

86 MILLION adults have prediabetes

9 OUT OF 10 people with prediabetes don’t know they have it

Without weight loss and moderate physical activity

15–30% of people with prediabetes will develop type 2 diabetes within 5 years

Let us all continue to partner and work together: Alone we can do so little; together we can do so much. – Helen Keller
THANK YOU VERY MUCH

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