Prediabetes & Type 2 Diabetes Prevention
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Disclosures

• None
Learning Objectives

• Screen patients for prediabetes and type 2 diabetes risk

• Identify and treat modifiable risk factors for cardiovascular disease

• Refer patients to a Diabetes Prevention Program or a Diabetes Self-Management Program

What is Prediabetes?

<table>
<thead>
<tr>
<th>Fasting plasma glucose</th>
<th>2-h plasma glucose during OGTT</th>
<th>Hemoglobin A1C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>Prediabetes</td>
<td>Diabetes</td>
</tr>
<tr>
<td>≥ 126 mg/dL</td>
<td>≥ 100 mg/dL</td>
<td>≥ 200 mg/dL</td>
</tr>
<tr>
<td>Prediabetes Impaired fasting glucose</td>
<td></td>
<td>Prediabetes Impaired glucose tolerance</td>
</tr>
<tr>
<td>100 mg/dL</td>
<td></td>
<td>140 mg/dL</td>
</tr>
<tr>
<td>Normal</td>
<td>Prediabetes Impaired glucose tolerance</td>
<td>Normal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prediabetes</td>
</tr>
<tr>
<td></td>
<td>5.7%</td>
<td>Prediabetes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Normal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.5%</td>
</tr>
</tbody>
</table>

*In the absence of unequivocal hyperglycemia, diagnosis requires two abnormal test results from the same sample or in two separate test samples.

Diagnosis of diabetes can also be made based on unequivocal symptoms & a random plasma glucose ≥200 mg/dL

Prevalence of Prediabetes

- 84.1 million people (33.9% of U.S. adults aged 18 years or older) had prediabetes in 2015
- Nearly half of adults aged 65 years or older had prediabetes
- Among adults with prediabetes, only 11.6% reported being told by HCP that they had this condition
- Prevalence of prediabetes was similar among racial and ethnic groups

2011–2014 National Health and Nutrition Examination Survey (NHANES), CDC
Case Study

Introduction

• Mr. N is a Hispanic male who just turned 45 years old. He comes in for a routine checkup a week after his birthday. He has mild asthma and is a-pack-a-day smoker but is considering quitting. He has no other health complaints and hasn’t had a checkup in 3 years.

• He is an investment banker and spends long hours at the office on his computer. He claims that he has limited time to exercise. His mother and maternal aunt has diabetes. His father has hypertension.

• Physical exam: height, 5’9” (175 cm); weight, 180 lbs (82 kg); BMI, 26.7 kg/m²; BP, 130/80 mmHg

Type 2 Diabetes Risk Factors

• First-degree relative with diabetes
• High-risk race/ethnicity (e.g., African American, Latino, Native American, Asian American, Pacific Islander)
• History of CVD
• Hypertension (≥140/90 mmHg or on therapy for hypertension)
• HDL cholesterol level <35 mg/dL (0.90 mmol/L) and/or a triglyceride level >250 mg/dL (2.82 mmol/L)
• Women with polycystic ovary syndrome
• Physical inactivity
• Other clinical conditions associated with insulin resistance (e.g., severe obesity, acanthosis nigricans)

Criteria for Screening for Prediabetes in Asymptomatic Adults

- Consider testing all adults with a BMI \( \geq 25 \text{ kg/m}^2 \) (\( \geq 23 \) in Asian Americans) and additional risk factors
  - If no risk factors, consider screening no later than age 45 years

- Women who were diagnosed with gestational diabetes should have lifelong testing at least every 3 years

- If normal results, repeat testing at \( \leq 3 \)-year intervals
  - More frequently depending on initial test results and risk factors
  - Test yearly if prediabetes


Case Study (cont’d)

Discussion Question
Should Mr. N be screened for type 2 diabetes?
A. Yes
B. No
Risk Assessment for Diabetes

- Be proactive
- Assess for risk factors
- Ask patients to take the ADA Diabetes Risk Test.* (5 or more=risk)
- If at high risk:
  - refer to a Diabetes Prevention Program
  - continue ongoing diabetes screening

* Available at: diabetes.org/risktest

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Risk Assessment for Diabetes for Mr. N

at high risk:
- Screen for diabetes
- refer to a Diabetes Prevention Program

* Available at: diabetes.org/risktest
PREVENTING OR DELAYING TYPE 2 DIABETES

Overview of Type 2 Diabetes Prevention Trials: Lifestyle Modification Intervention

- Lifestyle intervention continues to have an effect, even after 20 years

<table>
<thead>
<tr>
<th>Study</th>
<th>n</th>
<th>Intervention</th>
<th>Treatment</th>
<th>Risk reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Da Qing1,2</td>
<td>IGT 577</td>
<td>Lifestyle</td>
<td>6 years 23 years</td>
<td>51% 45%</td>
</tr>
<tr>
<td>Finnish DPS3,4</td>
<td>IGT 523</td>
<td>Lifestyle</td>
<td>3+ years 7 years</td>
<td>58% 43%</td>
</tr>
</tbody>
</table>

Diabetes Prevention Program

<table>
<thead>
<tr>
<th>Diabetes Prevention Program (DPP) (^{5,6})</th>
<th>IGT</th>
<th>3,324</th>
<th>Lifestyle</th>
<th>3 years</th>
<th>10 years</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>58%</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34%</td>
</tr>
</tbody>
</table>

- Lifestyle reduced type 2 diabetes by 58% over 3 years
- Lifestyle reduced type 2 diabetes by 34% over 10 years
- Metformin reduced type 2 diabetes by 31%

National Diabetes Prevention Program

Refer patients to an intensive behavioral lifestyle intervention program modeled on the Diabetes Prevention Program

[cdc.gov/prediabetes](https://www.cdc.gov/prediabetes)
CDC – DPP Houston sites

Brenda and John Duncan YMCA
10655 Clay Rd.
Houston, TX 77041
(713) 467-9622

D. Bradley McWilliams YMCA at Cypress Creek
19915 S.H. 249
Houston, TX 77070
(281) 469-1481

Houston Texans YMCA
5202 Griggs Rd.
Houston, TX 77021
(713) 748-5405

Perfect Lifestyle
2620 Tanglewilde St.
Houston, TX 77063
(713) 785-1272

Tellepsen Family YMCA
808 Pease
Houston, TX 77002
(713) 659-8501

Weekley Family YMCA
7101 Stella Link Blvd.
Houston, TX 77025
(713) 664-9622

YMCA of Greater Houston
2600 North Loop West Fwy.
Ste 300
Houston, TX 77092
(713) 758-9152

cdc.gov/prediabetes

Refer to Page 22 of your brochure

Standardization of the National DPP

1. Structured curricula available through CDC
2. DPP Lifestyle Coach training and certification for lay persons and for healthcare personnel who will deliver DPP
3. Intervention delivery method and intensity
   - In-person group or combined with virtual/online
   - Program duration of 12 months minimum
   - Two phases: months 0 – 6 is lifestyle change for weight loss goals; months 7 – 12 is maintenance
   - A minimum of 16 weekly sessions during phase 1 and 6 monthly sessions during phase 2
4. Performance metrics are required to certify a program through CDC.
Lifestyle Modification: *Facilitating Weight Loss*

- Initial target: 1-2 pound/week weight loss
- Long-range goal: 7% loss of body weight
- Increase physical activity to at least 150 min/week
- Individualized medical nutrition therapy
Lifestyle Modification: Facilitating Weight Loss

- Reduce caloric intake by 500-1000 kcal/day (depending on starting weight)
- Reduce dietary fat
- Limit intake of sugar-sweetened beverages
- Achieve the U.S. Department of Agriculture recommendation for dietary fiber of 14 g/1,000 kcal consumed
- Eat foods containing whole grains (one-half of grain intake)
- Try to eat 5-7 servings of fruits and vegetables a day.

Achieving Healthy Eating Habits: Plate Method

- Non-starchy vegetables
  - Spinach
  - Carrots
  - Lettuce
  - Greens
  - Cabbage
  - Green beans
  - Broccoli
  - Cauliflower
  - Tomatoes
- Grains and starchy foods
  - Whole grain breads
  - Sweet potatoes
  - Corn
  - High-fiber
- Protein
  - Chicken/turkey without skin
  - Fish (tuna, salmon, cod, catfish)
  - Tofu, eggs, low-fat cheese
  - Lean beef and pork
  - Beans

American Diabetes Association. Create your plate. Available at: diabetes.org/createyourplate/
Technology Tools for Prevention

Technology-assisted tools may be useful elements of effective lifestyle modification to prevent diabetes
- Internet-based social networks
- Distance learning
- DVD-based content
- Mobile applications
- Fitness trackers


Diabetes Prevention Program Program: 10-Year Cost-Effectiveness

- The study found that from a payer perspective, lifestyle was cost-effective and metformin was marginally cost-saving compared with placebo over 10 years
- From a societal perspective, DPP group lifestyle vs. placebo was cost-saving when undiscounted and had an incremental cost-effectiveness ratio of 1,681 at a 3% discount
- Investment in lifestyle as well as metformin as interventions for diabetes prevention in high-risk adults provides good value

Metformin For Prediabetes

Consider metformin therapy for prevention of type 2 diabetes in those with prediabetes, especially for those with

- BMI $\geq$ 35 kg/m$^2$
- Age < 60 years
- Prior gestational diabetes
- Rising A1C despite lifestyle intervention

Referrals

- National Diabetes Prevention Program
  - [cdc.gov/prediabetes](http://cdc.gov/prediabetes)
- Team-based approach to care
  - Physician
  - Nurse practitioner/physician assistant
  - Certified diabetes educator
  - Registered dietitian
  - Pharmacist
  - Exercise physiologist
  - Social worker/psychologist
Medicare Reimbursement for DPP

• Sites that deliver DPP, including non-healthcare settings with lay DPP coaches (e.g. churches, community centers, organizations) register as Medicare DPP suppliers
• Medicare DPP suppliers must be CDC-recognized
• Coverage started 04/01/18
• Pay-for-performance model

Identify and Treat CV Risk Factors in People with Prediabetes

<table>
<thead>
<tr>
<th>Non-modifiable</th>
<th>Modifiable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Physical inactivity</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td>Overweight/obesity</td>
</tr>
<tr>
<td>Gender</td>
<td>Hypertension</td>
</tr>
<tr>
<td>Family history</td>
<td>Smoking</td>
</tr>
<tr>
<td></td>
<td>Abnormal lipid levels</td>
</tr>
</tbody>
</table>

Follow-up Screening/Counseling

• Shown to be important to success
• Provide follow-up screenings for the development of diabetes
  - At least every 12 months for those with prediabetes
  - At least every 3 years if screening is negative
• On a regular basis, search EHR to determine who needs to be screened/rescreened
• Continually screen for modifiable risk factors at each interaction

Continued...


Evaluating Progress – What to Do

• Assess patient's concerns
• Reconcile their medications and lifestyle
• Revise the management plan as needed
  - If it doesn’t work in the patient’s life, it doesn’t work
• Ask the patient to identify one strategy/goal they would like to accomplish
• Provide information about materials available to achieve goals, such as weight loss or physical activity log

Funnell M. Role of Diabetes Education in Patient Management. Therapy for Diabetes Mellitus and Related Disorders.
Conclusions

As a member of the healthcare team, *YOU* can make a difference.

- *Only* 11% of people with prediabetes are aware they have it
- Identify those at risk for diabetes:
  - Proactively assess risk and screen/rescreen
  - Assess/advise with management strategies
  - Refer to Diabetes Prevention Program
  - Continually follow-up and evaluate
- Collaborate with other members of the healthcare team

Helpful Resources
Diabetes Self-Management Education and Support (DSMES)

~15% of ADA's recognized DSMES programs are also Diabetes Prevention Programs
ADA’s DPP Charting Platform

- ADA can assist your organization in becoming a CDC Recognized DPP provider with our web-based DPP Charting Platform that aligns with the CDC DPP data collection reporting requirements.
- ADA conducts free monthly DPP Charting Platform webinars. Register at www.diabetes.org/erpqa

For more information on the DPP Charting Platform contact the ADA at: erp@diabetes.org or 1.888.232.0822

Thank You!