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?

Fasting plasma glucose

- Diabetes
  - Prediabetes Impaired fasting glucose
  - Normal

- Normal

2-h plasma glucose during OGGT

- Diabetes
  - Prediabetes Impaired glucose tolerance
  - Normal

- Normal

Hemoglobin A1C

- Diabetes
  - Prediabetes
  - Normal

- Normal

Any abnormality must be repeated and confirmed on a separate day using the same test

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, 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 an Asian 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. No one in his immediate family has had diabetes but 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 (PCOS)
• 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 ≥25 kg/m² (≥23 in Asian Americans) and additional risk factors
  - If no risk factors, consider screening at age 45 years
- Women who were diagnosed with gestational diabetes should have lifelong testing at least every 3 years
- Patients with prediabetes (IFG or IGT) should be tested yearly
- If normal results
  - repeat testing at ≤3-year intervals
  - More frequently depending on initial test results and risk factors

Mr. N

Introduction

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- Physical exam: height, 5’9” (175 cm); weight, 180 lbs (82 kg); BMI, 26.7 kg/m²; BP, 130/80 mmHg
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
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>577</td>
<td>Lifestyle</td>
<td>6 years</td>
<td>51%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>23 years</td>
<td>45%</td>
</tr>
<tr>
<td>Finnish DPS³,⁴</td>
<td>523</td>
<td>Lifestyle</td>
<td>3+ years</td>
<td>58%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7 years</td>
<td>43%</td>
</tr>
<tr>
<td>Diabetes Prevention Program (DPP)⁵,⁶</td>
<td>3,324</td>
<td>Lifestyle</td>
<td>3 years</td>
<td>58%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 years</td>
<td>34%</td>
</tr>
</tbody>
</table>

Diabetes Prevention Program

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

Major goals of the program:
- Achieve and maintain minimum 7% weight loss
- 150 minutes of physical activity/week (brisk walking)


National Diabetes Prevention Program

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

- achieve and maintain 5-7% loss of initial body weight
- increase moderate-intensity physical activity (such as brisk walking) to at least 150 min/week

[cdc.gov/prediabetes](https://www.cdc.gov/prediabetes)


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:
     - Phase 1 - months 0 – 6 is lifestyle change for weight loss goals (16 weekly sessions)
     - Phase 2 - months 7 – 12 is maintenance (6 monthly sessions)

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
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

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: 10-Year Cost-Effectiveness

- Lifestyle cost-effective
- Metformin cost-saving vs. placebo
- Investment in lifestyle and metformin interventions for diabetes prevention in high-risk adults provides good value

Diabetes Prevention Program: 10-Year Cost-Effectiveness

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

• 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
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

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

ADA’s DPP Charting Platform

• ~15% of ADA’s recognized DSMES programs are also Diabetes Prevention Programs

• 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
**American Medical Association**

- [https://amapreventdiabetes.org](https://amapreventdiabetes.org)
- Diabetes prevention strategy
- Diabetes prevention toolkit

<table>
<thead>
<tr>
<th>Name of Program</th>
<th>Location</th>
<th>Phone number</th>
<th>Nutritionists, Dieticians and Lifestyle Coaches</th>
<th>Access to Gym</th>
<th>Meal Planning</th>
<th>Program Timeline</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baton Rouge General Health and Wellness Center</td>
<td>Baton Rouge</td>
<td>(225) 919-1175</td>
<td>1 Registered Dietitian, Dietitian certified NDEP Coach</td>
<td>Yes</td>
<td>Yes</td>
<td>12 month course: 16 weeks of weekly meetings, plus 60 days of maintenance, 6-9 months monthly meetings</td>
<td>Pending</td>
</tr>
<tr>
<td>Women's Hospital Diabetes Education Services</td>
<td>Baton Rouge</td>
<td>(225) 924-8310</td>
<td>3 Lifestyle Coaches and 1 Nutritional</td>
<td>Yes</td>
<td>Yes</td>
<td>6 months weekly sessions, monthly meetings</td>
<td>Yes</td>
</tr>
<tr>
<td>YMCA of the Capital area</td>
<td>Baton Rouge</td>
<td>(225) 924-3606</td>
<td>Lifestyle Coaches, CDC Certified</td>
<td>Yes</td>
<td>Yes</td>
<td>16 10 week weekly sessions, followed by multiple sessions</td>
<td>Pending</td>
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<tr>
<td>AM Health Services</td>
<td>Lafayette</td>
<td>(337) 456-2400</td>
<td>4 Lifestyle Coaches, CDC Certified</td>
<td>Yes</td>
<td>Yes</td>
<td>6 months weekly sessions, monthly meetings, 3 monthly visits 12 months</td>
<td>Pending</td>
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<tr>
<td>East Jefferson General Hospital</td>
<td>Metairie</td>
<td>(504) 503-4165</td>
<td>2 CDE, Exercise Physiologist, Dietitian</td>
<td>Yes</td>
<td>Yes</td>
<td>4 weekly sessions in Diabetes Education Program</td>
<td>No longer Participating</td>
</tr>
<tr>
<td>Outpatient Medical Center, Inc.</td>
<td>Natchitoches</td>
<td>(318) 352-0390 Ext. 2055</td>
<td>3 Lifestyle Coaches, CDC Certified</td>
<td>No</td>
<td>Yes</td>
<td>10 weekly sessions plus 84 Month sessions total for program</td>
<td>Pending</td>
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<tr>
<td>Best Life Pharmacy and Restaurant</td>
<td>New Orleans</td>
<td>(504) 264-5100</td>
<td>None</td>
<td>No</td>
<td>In Development</td>
<td>Program in Development</td>
<td>Pending</td>
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<tr>
<td>Care Matters, Inc</td>
<td>New Orleans</td>
<td>(504) 493-8894</td>
<td>Pharmacist, CDE, Lifestyle coach</td>
<td>Unknown, Incorporates Exercise Education</td>
<td>Yes</td>
<td>10 weekly sessions then 2 months then monthly for remaining 6 months</td>
<td>Pending</td>
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<tr>
<td>University Medical Center of New Orleans</td>
<td>New Orleans</td>
<td>(504) 702-3000</td>
<td>Certified diabetes educator, Dietitian</td>
<td>No</td>
<td>ND</td>
<td>ND</td>
<td>Pending</td>
</tr>
<tr>
<td>VELT</td>
<td>New Orleans</td>
<td>(504) 255-0400</td>
<td>None</td>
<td>No</td>
<td>Yes</td>
<td>6 week Exercise and Dietary Education Classes</td>
<td>No longer seeking Certification</td>
</tr>
<tr>
<td>YMCA of Greater New Orleans</td>
<td>New Orleans</td>
<td>(504) 568-9622</td>
<td>4 Lifestyle Coaches, CDC Certifed</td>
<td>No</td>
<td>ND</td>
<td>10 weekly sessions, Monthly 2 months, then bi-monthly</td>
<td>Pending</td>
</tr>
<tr>
<td>Diabetes Assessment and Management Center of Shreveport</td>
<td>Shreveport</td>
<td>(318) 212-1194</td>
<td>2 Lifestyle Coaches, CDC certified, Licensed Diетitian and exercise coach</td>
<td>No</td>
<td>Yes</td>
<td>Complete 10 weekly sessions for 16 months, then bi-monthly for 6 months</td>
<td>Pending</td>
</tr>
<tr>
<td>MLC Health Center and Pharmacy</td>
<td>Shreveport</td>
<td>(318) 227-2912 Ext. 1</td>
<td>2 Lifestyle Coaches, CDC certified, Licensed Diетitian and exercise coach</td>
<td>No</td>
<td>Yes</td>
<td></td>
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</tr>
</tbody>
</table>

**Legend**

- ND: No Data
- * Must complete total 22 sessions, but typically 26 sessions completed per patient
- † Kitchen for cooking and meal planning
- ‡ No longer participating in NDEP due to cost and poor retention, have Diabetic Education Program as noted
- ¶ Participants given free 3 month membership after 5th session if continuing to participate
- ▲ Required to complete 56 sessions in total
CONCLUSIONS
As we observed in 2004, rates of screening are high. HbA1c is still used less frequently than glucose for screening but is more likely to result in a clinical diagnosis.

OBJECTIVE
We examined changes in screening practices for prediabetes and diabetes since January 2010, when HbA1c was first recommended as an option for screening and diagnosis.

Thank You!