Prediabetes & Type 2 Diabetes Prevention

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Disclosures

- I have no disclaimers.
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>126 mg/dL</td>
<td>6.5%</td>
</tr>
<tr>
<td>Prediabetes Impaired fasting glucose</td>
<td>100 mg/dL</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>100 mg/dL</td>
<td>5.7%</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 $\geq 200$ mg/dL

Considerations diagnosing pre/T2DM

- conditions associated with an altered relationship between A1c and glycemia
  - Sickle cell
  - Pregnancy (second and third trimester)
  - Glucose-6-phosphate dehydrogenase deficiency
  - HIV
  - Hemodialysis
  - Recent blood loss or transfusion
  - Erythropoietin therapy

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
Burden of Diabetes In Arizona

- 682,071 people in Arizona or 12.5% of the adult population have T2DM
- 172,000 have T2DM and don’t know it
- 1.796,000 people in Arizona 37.5% of the adult population, have prediabetes.
- $6.4 billion is spent each year in Arizona.

Case Study

Ms JT, 31-year-old African American female with no significant past medical history is referred by her workplace to a primary care physician for an elevated blood pressure (BP). She presents to the clinic with no complaints. Her mother and grandmother both have diabetes, and her father has hypertension. She has had a 15-pound (lb) weight gain over the last year and has become more sedentary.

Her BP is 142/90 mm Hg, pulse is 88 beats per minute (bpm), weight is 209 lb, and height is 5’ 7”. On examination displays moderate central obesity, but otherwise the examination is normal.

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 ≥25 kg/m² (≥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 ≤3-year intervals
  - More frequently depending on initial test results and risk factors
  - Test yearly if prediabetes

Case Study (cont’d)

Discussion Question
Should Ms. JT 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]


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
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
Metformin For Prediabetes

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

- BMI ≥ 35 kg/m²
- Age < 60 years
- Prior gestational diabetes
- Rising A1C despite lifestyle intervention
Metformin dosage, precautions, side effects

- The usual starting dose of Metformin hydrochloride tablets is 500 mg twice a day or 850 mg once a day, given with meals.
- Assess renal function prior to initiation of Metformin hydrochloride tablets and periodically thereafter.
- Use with caution with patients with a history of liver disease, alcoholism, or heart failure;
- Metformin is contraindicated in patients with an estimated glomerular filtration rate (eGFR) below 30 mL/minute/1.73 m
- Long-term use of metformin can cause Vit B-12 deficiency and lactic acidosis (a buildup of an acid in the blood) that can cause death. Lactic acidosis is a medical emergency and must be treated in the hospital.
- Discontinue Metformin at the time of, or prior to, an iodinated contrast imaging procedure. Re-evaluate eGFR 48 hours after the imaging procedure; restart Metformin hydrochloride if renal function is stable.

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>
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<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>
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</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
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

Questions/Comments
Thank You!