Prediabetes Screening and Management: A Spoonful of Prevention!
Get Ahead of Diabetes

Kate Kirley, MD, MS
Neha Sachdev, MD

ACTIVITY DISCLAIMER

The material presented here is being made available by the American Academy of Family Physicians for educational purposes only. Please note that medical information is constantly changing; the information contained in this activity was accurate at the time of publication. This material is not intended to represent the only, nor necessarily best, methods or procedures appropriate for the medical situations discussed. Rather, it is intended to present an approach, view, statement, or opinion of the faculty, which may be helpful to others who face similar situations.

The AAFP disclaims any and all liability for injury or other damages resulting to any individual using this material and for all claims that might arise out of the use of the techniques demonstrated therein by such individuals, whether these claims shall be asserted by a physician or any other person. Physicians may care to check specific details such as drug doses and contraindications, etc., in standard sources prior to clinical application. This material might contain recommendations/guidelines developed by other organizations. Please note that although these guidelines might be included, this does not necessarily imply the endorsement by the AAFP.
DISCLOSURE

It is the policy of the AAFP that all individuals in a position to control content disclose any relationships with commercial interests upon nomination/invitation of participation. Disclosure documents are reviewed for potential conflict of interest (COI), and if identified, conflicts are resolved prior to confirmation of participation. Only those participants who had no conflict of interest or who agreed to an identified resolution process prior to their participation were involved in this CME activity.

All individuals in a position to control content for this session have indicated they have no relevant financial relationships to disclose.

The content of my material/presentation in this CME activity will include discussion of unapproved or investigational uses of products or devices as indicated:

• Will include discussion of Metformin for the indication of prediabetes treatment. This is a non-FDA approved (off-label) use of Metformin despite high quality evidence of efficacy and safety.

Kate Kirley, MD, MS

Director of Chronic Disease Prevention, Improving Health Outcomes group, American Medical Association (AMA), Chicago, Illinois

After graduating from the University of Michigan Medical School, Ann Arbor, Dr. Kirley completed her family medicine residency at the University of Illinois at Chicago (UIC)/Illinois Masonic Medical Center. She subsequently completed a research fellowship at the University of Chicago. Currently, she serves as the lead clinician for the AMA’s diabetes prevention initiatives. Prior to joining the AMA, Dr. Kirley was a practicing family physician and health services researcher at NorthShore University HealthSystem, and a clinical assistant professor in the University of Chicago’s Department of Family Medicine. She also served as assistant director of NorthShore’s Quality and Patient Safety Fellowship and as assistant director of the Ambulatory Primary Care Innovations Group, a practice-based research network.
Neha Sachdev, MD

Director of Health Systems Relationships in Improving Health Outcomes, American Medical Association, Chicago, Illinois

In her role, Dr. Sachdev works with physicians, care teams, and health care organizations to implement evidence-based strategies for the prevention of cardiovascular disease. Prior to joining the American Medical Association (AMA), she was a core faculty attending physician at the Virtua Health family medicine residency program. After earning her medical degree from Sidney Kimmel Medical College at Thomas Jefferson University, Philadelphia, Pennsylvania, Dr. Sachdev completed her family medicine residency training at McGaw Medical Center of Northwestern University and Erie Family Health Center in Chicago, Illinois, as part of the Teaching Health Center Graduate Medical Education (THCGME) program. She holds a Bachelor of Arts degree in Hispanic Studies and Health and Societies from the University of Pennsylvania.

Learning Objectives

1. Recognize the pathogenesis, progression risks, and management strategies for patients with pre-diabetes.

2. Establish evidence-based systematic protocols for screening patients for diabetes mellitus.

3. Use evidence-based recommendations and guidelines to order appropriate diagnostic tests to diagnose and confirm the etiology of diabetes.

4. Counsel patients on lifestyle modifications they can make to reduce their risk for developing diabetes and comorbidities, including diet, exercise, smoking cessation and alcohol consumption.
Associated Sessions

• (PBL) Prediabetes Screening and Management: A Spoonful of Prevention! Get Ahead of Diabetes

Audience Engagement System

Step 1

Step 2

Step 3
Epidemiology and Pathogenesis
Diagnosed Diabetes, Age-Adjusted Percentage, Adults with Diabetes - U.S. States

Source: www.cdc.gov/diabetes/data
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.

Source: Prediabetes in the US

Prediabetes in the US

Table 3. Estimated number, percentage, and awareness of prediabetes among adults aged ≥18 years, United States, 2015

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. in millions (95% CI)</th>
<th>Percentage (95% CI)</th>
<th>Percentage aware of prediabetes (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>84.1 (78.6–90.4)</td>
<td>33.9 (31.5–36.5)</td>
<td>11.6 (9.9–13.6)</td>
</tr>
</tbody>
</table>

~1 out of 3 adults affected  9 out of 10 are unaware
Poll Question #1

Which of the following is **not** a risk factor for abnormal glucose metabolism?

A. African American race  
B. Obesity  
C. Hypertension  
D. Smoking  
E. Alcohol use

Pathogenesis

Complex, incompletely understood

Excess adipose tissue  
Decreased insulin sensitivity  
Progressive loss of beta cell insulin secretion

Genes  Environment  Lifestyle  Social Determinants  Microbiome  ???
Risk Factors for Type 2 Diabetes

- Adiposity
  - BMI, waist circumference
- Lifestyle factors
  - Physical activity level, sedentary time, smoking status
- Medical history
  - Gestational diabetes, metabolic syndrome
- Dietary factors
  - Dietary pattern, sugar sweetened beverage intake
- Other factors
  - Psychosocial factors, biomarkers

+ family history and racial/ethnic background


Social Determinants and Risk

- Low early life socioeconomic conditions
  - 1.54 OR for prediabetes
  - 1.46 OR for type 2 diabetes

- Low adulthood socioeconomic conditions
  - 1.67 OR for prediabetes
  - 3.43 OR for type 2 diabetes

Poll Question #2

A 55 yo woman comes to see you for an annual wellness visit. She last had a fasting glucose test checked 4 years ago that was normal. What is the most appropriate way to screen her for abnormal glucose?

A. Fasting plasma glucose
B. Hemoglobin A1c
C. 2-hour glucose tolerance test
D. No screening – she is up to date

Identification and Screening
Guidelines/Recommendations/Clinical Resources Related to Diabetes Prevention

<table>
<thead>
<tr>
<th>Organization</th>
<th>Guidelines</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States Preventive Services Task Force</td>
<td>Abnormal Glucose Screening Recommendation (2015)*</td>
</tr>
<tr>
<td>American Diabetes Association</td>
<td>Standards of Medical Care in Diabetes (2019)</td>
</tr>
<tr>
<td>Community Preventive Services Task Force</td>
<td>Diabetes Prevention and Control: Combined Diet and Physical Activity Promotion Programs to Prevent Type 2 Diabetes Among People at Increased Risk (2015)</td>
</tr>
<tr>
<td>National Diabetes Education Program</td>
<td>Guiding Principles for the Care of People With or At Risk for Diabetes (2018)</td>
</tr>
</tbody>
</table>

*in process of being updated

United States Preventive Services Task Force (USPSTF) Abnormal Glucose Screening Recommendation

**Grade B recommendation**

- Screen all adults ages 40-70 AND who have a BMI ≥ 25
- Screen with a fasting glucose, hemoglobin A1C or oral glucose tolerance test

*USPSTF standards suggest testing patients every 3 years*

United States Preventive Services Task Force (USPSTF) Abnormal Glucose Screening Recommendation

Consider testing adults of a lower age or BMI if risk factors present.

- **Family history**
  - Family history of type 2 diabetes includes first-degree relatives (a person's parent, sibling or child)

- **Medical history**
  - Gestational diabetes
  - Polycystic ovary syndrome

- **Racial & ethnic minorities**
  - African Americans
  - American Indians
  - Alaskan Natives
  - Asian Americans
  - Hispanics or Latinos
  - Native Hawaiians or Pacific Islanders

ADA Standards of Medical Care in Diabetes

- Informal risk assessment or validated risk assessment tool should be considered in asymptomatic adults to guide on need for diagnostic testing

- Consider testing adults at any age with BMI ≥25 (≥23 for Asian Americans) and one or more risk factors
  - First degree relative with DM
  - High-risk race/ethnicity
  - History of CVD
  - HTN
  - HDL <35 mg/dL and/or Triglycerides >250mg/dL
  - Women with PCOS
  - Physical inactivity
  - Conditions associated with insulin resistance
ADA Standards of Medical Care in Diabetes

- Begin testing all adults at age 45
- Equally appropriate to use A1C, fasting plasma glucose or 2 hour oral glucose tolerance for testing
- If initial results are normal, repeat testing at a minimum of 3 year intervals
- Women with a history of gestational diabetes should have lifelong testing at least every 3 years

AACE/ACE Clinical Practice Guidelines

**Risk factors for prediabetes/type 2 diabetes: Criteria for testing in asymptomatic adults**

<table>
<thead>
<tr>
<th>Age ≥45 years without other risk factors</th>
<th>CVD or family history of type 2 DM</th>
<th>BMI that is overweight or obese*</th>
<th>Sedentary lifestyle</th>
<th>Member of at-risk racial or ethnic group</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDL &lt; 35 and/or Triglycerides &gt;250</td>
<td>IGT, IFT or metabolic syndrome</td>
<td>PCOS, Acanthosis Nigricans, NAFLD</td>
<td>Hypertension (BP &gt;140/90 or on therapy)</td>
<td>History of gestational diabetes or delivery of baby &gt; 4kg</td>
</tr>
</tbody>
</table>

Antipsychotic therapy for schizophrenia/bipolar disease

| Chronic glucocorticoid exposure | Sleep disorders in presence of glucose intolerance including OSA, chronic sleep deprivation and night shift occupation |

*At-risk BMI may be lower in some ethnic groups; consider using waist circumference or other factors

BMI = body mass index; BP = blood pressure; CVD=cardiovascular disease; HDL-C = high density lipoprotein cholesterol; IFG = impaired fasting glucose; IGT = impaired glucose tolerance; NAFLD = nonalcoholic fatty liver disease; PCDS = polycystic ovary syndrome
AACE/ACE Clinical Practice Guidelines

- Testing should be considered in all adults who are obese and all adults who are overweight with additional risk factors
- Individuals with 2 or more risk factors- consider annual screening
- Individuals at risk with glucose values in the normal range- screen every 3 years
- Metabolic syndrome (based on NCEP criteria) should be considered a prediabetes equivalent
- A1C should be used only for screening - diagnosis of prediabetes should be confirmed with glucose testing

Acceptable Laboratory Tests

<table>
<thead>
<tr>
<th>Lab Test</th>
<th>Advantages/Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1C</td>
<td>Convenient&lt;br&gt;Accuracy of test is monitored&lt;br&gt;Representative of glucose over months&lt;br&gt;Cost (not covered by Medicare)&lt;br&gt;Relationship with glycemia can be altered by certain conditions</td>
</tr>
<tr>
<td>FPG</td>
<td>Widely available&lt;br&gt;Biological variability- can be affected by recent activities of patient&lt;br&gt;Often hard to assess if previous lab results were fasting&lt;br&gt;Variability amongst lab measurement and with blood source</td>
</tr>
<tr>
<td>OGTT</td>
<td>Assesses response to glucose challenge- sensitive indicator&lt;br&gt;Requires time and extensive patient preparation&lt;br&gt;Expensive</td>
</tr>
</tbody>
</table>

Management of Abnormal Glucose

Prediabetes Identification

ICD10 code:
R73.03
Poll Question #3

Your 55 year-old patient has a lab result consistent with prediabetes. What do you do next?

A. Counsel her to lose weight
B. Document the diagnosis and educate the patient about her diagnosis
C. Refer her to an intensive weight loss or lifestyle change program
D. Prescribe Metformin
E. None of the above

Diabetes Prevention Program Program RCT

- NIH-funded 3-arm RCT (N=3234) comparing placebo vs metformin vs intensive lifestyle counseling
  - Low calorie, low fat diet plus moderate physical activity
  - Program goal: ≥7% weight loss

- The lifestyle intervention **reduced the incidence by 58%** compared to placebo
  - Metformin reduced the incidence by 31% compared to placebo

United States Preventive Services Task Force (USPSTF) Abnormal Glucose Screening Recommendation

Offer or refer patients with abnormal glucose to intensive behavioral counseling interventions to promote a healthful diet and physical activity

National Diabetes Prevention Program lifestyle change program

- Designed to slow and prevent the development of type 2 diabetes
- Comprehensive program focused on weight loss through increased physical activity and diet and behavior modification
- Can be delivered in-person, online or via distance learning
- Can be delivered in community or clinical settings

Emphasis is on prevention and empowerment through a personal action plan

Trained lifestyle coaches teach group classes; coaches can be health professionals but do not have to be
National Diabetes Prevention Program
lifestyle change program

- Quality assurance through the Centers for Disease Control and Prevention
- CDC is mandated by Congress to oversee the program
- Program providers apply for recognition to the CDC

Eligibility for a DPP lifestyle change program

✓ BMI ≥25 (≥23 if Asian American)

AND

✓ One of the following
  - Prediabetes diagnosis
  - History of GDM
  - Elevated risk score (ADA or doihaveprediabetes.org screener)

*do not need a laboratory test; participants can self-refer
Coverage for DPP lifestyle change programs

- Medicare coverage began April 2018
- Medicaid coverage in 6 states, with ongoing pilots in 4 states
- State employee coverage in 20 states with 4 pilots
- Growing private insurers offering coverage (Anthem, Cigna)

The Role of Physicians and Care Teams in Diabetes Prevention

- Identify patients at risk for type 2 diabetes
- Engage in shared decision-making with patients and manage with evidence-based treatment option
- Support individuals in their treatment plan

Everyone with prediabetes should be aware of the condition and receive treatment.
Tools for Diabetes Prevention

- Patient risk assessment
- Patient education handouts
- Clinical protocols
- Relevant ICD10 and CPT codes
- Evidence summary

..........and more to come!

www.amapreventdiabetes.org

Information about DPP lifestyle change programs

CDC’s National Diabetes Prevention Program

To locate a program
https://nccd.cdc.gov/DDT_DPRP/Programs.aspx
Access Challenges

No DPP lifestyle change program near you?

*Explore the possibility of starting a program within your organization*

Patients with transportation or time limitations?

*Refer patients to CDC-recognized digital programs*

Digital DPP lifestyle change programs

- Participant experience
  - Complete curricula on their own time (asynchronously)
  - Can use smart scales to monitor weight or wearables to track activity
  - Personalized health coaching via messaging
  - Group support on online platform
- Effective for achieving clinically meaningful weight loss (5% of body weight)
- Recognized by CDC; currently over 25 providers
  - Examples: Noom, Omada, Livongo

Metformin

- Not FDA-approved for diabetes prevention
- High-quality evidence demonstrates effectiveness
- Consider in those with
  - BMI $\geq 35$ kg/m$^2$
  - Age $<60$
  - Women with h/o GDM
  - Worsening glucose despite lifestyle intervention


Poll Question #4

Your patient is overwhelmed by her diagnosis of prediabetes. She is hearing that she has to lose weight and make changes but she's tried before with no success. What can you tell her?

A. You can reduce your risk by losing only 5% of your body weight
B. Your risk of diabetes is high if you don’t change
C. You can take a pill
D. We can keep monitoring you to see if it gets worse
Common Physician Concerns

• I’m not really sure what to tell my patients
• Even if I counsel them, my patients still fail to change
• I don’t have enough time

Structured Counseling Strategies

<table>
<thead>
<tr>
<th>Transtheoretical (Stages of Change)</th>
<th>Assesses patients’ motivation for change; focused on specific health behavior and adherence; can guide choice of subsequent counseling model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Five A’s (Ask, Advise, Assess, Assist, Arrange)</td>
<td>Stepwise approach, assumes patients lack complete knowledge and will respond to direct advice; impact of each A varies</td>
</tr>
<tr>
<td>FRAMES (Feedback, Responsibility of Patient, Advice to Change, Menu of Options, Empathy, Self-efficacy Enhancement)</td>
<td>Precursor to MI, provides new information; encourages personalized selection to treatment, shared decision-making</td>
</tr>
<tr>
<td>Motivational Interviewing</td>
<td>Recognizes and acknowledges ambivalence to change, provides systematic approach to increase motivation; relates health behavior to patient values</td>
</tr>
</tbody>
</table>

Counseling Patients- Key Messages

• Your blood glucose is higher than normal but not at the level of diabetes. This condition is called prediabetes.

• Prediabetes is a serious condition: It poses a high risk of eventually progressing to diabetes and raises your risk of other medical conditions.

• Prediabetes is treatable and can be reversible
  • The goal is to lose a modest amount of weight (5-7% of body weight) and lead a healthier lifestyle
  • A lifestyle change program can support you to do this and help you make lasting healthy behavior changes

Practice Recommendations for Physicians & Care Teams

• Involve the entire care team in identifying patients at risk for abnormal glucose and those with prediabetes
  – Diagnose those who have the condition and document the diagnosis

• Utilize the electronic health record
  – Establish a prediabetes registry
  – Incorporate clinical decision support
  – Provide regular reports to care teams

• Implement structured counseling strategies and shared decision-making

• Monitor patients
  – Schedule follow-up to support patient engagement in lifestyle change
  – Repeat labs/order additional tests as needed

Contact Information

• Kate Kirley
  Kate.Kirley@ama-assn.org
  @KateKirley

• Neha Sachdev
  Neha.Sachdev@ama-assn.org
Questions