

## THE SOUTHERN DIABETES INITIATIVE



*Screen, Assess, Treat, Repeat*

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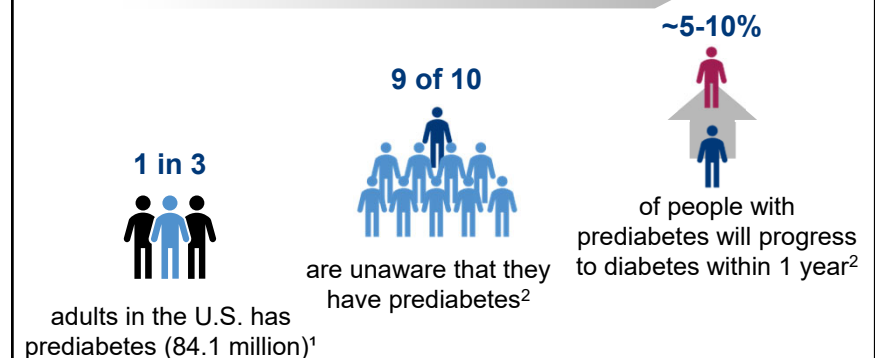
## Learning Objectives

- ❖ Improve screening and diagnosis of prediabetes and diabetes
- ❖ Prevent T2DM and delay progression through patient education and lifestyle interventions

## Abbreviations

<b>FPG</b>	Fasting plasma glucose
<b>HbA1c</b>	Hemoglobin A1c
<b>IFG</b>	Impaired fasting glucose
<b>IGT</b>	Impaired glucose tolerance
<b>OGTT</b>	Oral glucose tolerance test
<b>PG</b>	Plasma glucose

## Steps on the Road to Diabetes



(1) CDC and Prevention. National Diabetes Statistic Report, 2017; (2) Tabak AG, et al. Prediabetes: a high-risk state for the development. Lancet.2012;379:2279-2290.

Syllabi/slides for this program are a supplement to the live CME session and are not intended for other purposes.

## Prediabetes Has Consequences

### Prediabetes and diabetes are a continuum

#### Pre-diabetes:

↑risk of **microvascular and macrovascular complications**

#### Lack of clinician awareness of these risks:

↓**vigilance** and ↓**early intervention**

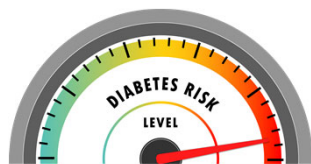


Brannick, B, et al. Exp Biol Med (Maywood). 2016;241(12):1323-1331; Decode Study Group. Lancet. 1999;354:617-662; Huang Y, et al. Diabetologia. 2014 Nov; 57(11):2261-2269.



## Screening for Prediabetes and Diabetes

## Screening Adults for Prediabetes and Diabetes



### For asymptomatic adults:

Use **informal assessment of risk factors** and **validated tools** to screen for prediabetes and risk for future diabetes

### Additional screening option:

<https://www.diabetes.org/risk-test>

*Focuses on seven categories*

- |                  |                  |
|------------------|------------------|
| 1 AGE            | 4 BLOOD PRESSURE |
| 2 GENDER         | 5 WELLNESS       |
| 3 FAMILY HISTORY | 6 ETHNICITY      |
|                  | 7 BMI            |

ADA. Diabetes Care. 2019; 42(1):S13-27.

## Audience Response Question



The ADA suggests testing which of the following patients for prediabetes and diabetes?

1. A 25-year-old Latina woman with BMI 33 kg/m<sup>2</sup> and PCOS
2. A 30-year-old African American man with a BMI 27 kg/m<sup>2</sup> and a first degree relative with T2DM
3. A 47-year-old Caucasian woman with a BMI 23 kg/m<sup>2</sup> and no risk factors for T2DM
4. A 35-year-old Asian woman with a BMI 23 kg/m<sup>2</sup> who is physically inactive
5. All of the above

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## Testing Adults for Prediabetes and Diabetes

The ADA recommends testing

Anyone **age ≥45 years**

Anyone **overweight** (BMI ≥25 or ≥23 kg/m<sup>2</sup> in Asian Americans) **AND at least one additional risk factor:**

- ☐ Physical inactivity
- ☐ First degree relative with diabetes
- ☐ Member of high-risk ethnic population
- ☐ Known previous prediabetes
- ☐ CVD, hypertension, or dyslipidemia
- ☐ Polycystic ovary syndrome
- ☐ History of gestational diabetes or delivered a baby weighing >9 lbs
- ☐ Other clinical conditions associated with insulin resistance (e.g., acanthosis nigricans)

ADA. *Diabetes Care*. 2019; 41(1):S13-27.

## Rationale

- ☒ A 25-year-old Latina woman with BMI 33 kg/m<sup>2</sup> and PCOS  
Yes, she has a BMI ≥25 kg/m<sup>2</sup> and an additional risk factor (PCOS)
- ☒ A 30-year-old African American man with a BMI 27 kg/m<sup>2</sup> and a first degree relative with T2DM  
Yes, he is a member of a high-risk ethnic group with a BMI ≥25 kg/m<sup>2</sup> and a first degree relative with diabetes
- ☒ A 47-year-old Caucasian woman with a BMI 23 kg/m<sup>2</sup> and no risk factors for T2DM  
Yes, she is ≥45 years old
- ☒ A 35-year-old Asian woman with a BMI 23 kg/m<sup>2</sup> who is physically inactive  
Yes, data suggest that for an Asian American a BMI ≥23 kg/m<sup>2</sup> may be overweight and she has another risk factor (physical inactivity)
- ☒ All of the above  
Best answer

## Audience Response Question

?

Which of the following does the ADA consider the best screening test for prediabetes and diabetes?

1. Fasting plasma glucose (FPG)
2. 2-hour plasma glucose during 75-g oral glucose tolerance test (OGTT)
3. HbA1c
4. All are equally appropriate

## Diagnostic Criteria for Prediabetes and Diabetes in Non-pregnant Adults

Normal	Prediabetes	Diabetes
FPG <100 mg/dL	<b>IFG</b> FPG 100-125 mg/dL	FPG ≥126 mg/dL
2-h PG <140 mg/dL	<b>IGT</b> 2-h PG ≥140-199 mg/dL	2-h PG during OGTT ≥200 mg/dL <b>OR</b> Random PG ≥200 mg/dL + symptoms (polydipsia, polyuria, polyphagia, weakness, unexplained weight loss, blurred vision)
HbA1c <sup>†</sup> <5.6%	5.7 to 6.4%	≥6.5%

Absent unequivocal hyperglycemia, a diagnosis of diabetes should be confirmed with a **2nd** abnormal test

ADA. *Diabetes Care*. 2019; 42(1):S13-28.  
<sup>†</sup>performed using a method that is certified by the NGSP and standardized or traceable to the Diabetes Control and Complications Trial (DCCT) reference assay

**FPG** = fasting plasma glucose; **IFG** = impaired fasting glucose; **IGT** = impaired glucose tolerance; **OGTT** = oral glucose tolerance test; **PG** = plasma glucose

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## Rationale



- ☒ Fasting plasma glucose (FPG)
- ☒ 2-hour plasma glucose during 75-g oral glucose tolerance test (OGTT)
- ☒ HbA1c
- ☒ All are equally appropriate Best answer

## Audience Response Question



According to the 2019 ADA guidelines for screening adults for T2DM, which of the following is true?

1. If results are normal, screening should be repeated every 5 years
2. Patients with pre-diabetes should have repeat testing every 6 months
3. Screening frequency should be dependent on initial screening results and risk status
4. Women with a h/o gestational diabetes should be screened every year

## Rationale Screening Frequency in Adults



- |  |   |
|--|---|
| <input checked="" type="checkbox"/> If results are normal, screening should be repeated every 5 years                    | If results are normal, screening should be repeated every 3 years   |
| <input checked="" type="checkbox"/> Patients with pre-diabetes should have repeat testing every 6 months                 | Patients with pre-diabetes (HbA1c $\geq$ 5.7%, IGT, or IFG) should have repeat testing every 12 months at a minimum, so every 6 months is not incorrect |
| <input checked="" type="checkbox"/> Screening frequency should be dependent on initial screening results and risk status | Correct   |
| <input checked="" type="checkbox"/> Women with a h/o gestational diabetes should be screened every year                  | They should have lifelong testing at least every 3 years  |

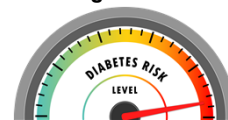
ADA. *Diabetes Care*. 2019; 42(1):S13-28.

## Screening Asymptomatic Children for Prediabetes and Diabetes

### Criteria

Consider for all children who are **overweight** ( $\geq$ 85% percentile) or **obese** ( $\geq$ 95 percentile) and who have **1 of any of the following risk factors**:

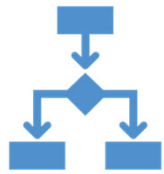
- ☐ Family history of T2DM in first- or second-degree relative
- ☐ High-risk race/ethnicity
- ☐ Signs of insulin resistance/conditions associated with insulin resistance
- ☐ Maternal history of DM or GDM during child's gestation



- Risk-based screening should begin at  **$\geq$ 10 years/onset of puberty**
- If tests are normal, repeat testing at least **every 3 years** (more frequently if BMI is increasing)
- **HbA1C test** is recommended for diagnosis

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## Treating Prediabetes and Diabetes

### Audience Response Question



According to the ADA, which of the following recommendations can help prevent a patient with prediabetes from progressing to T2DM?

1. 150 min/week of brisk walking or exercise of similar intensity
2. Achieve and maintain a 5% weight loss in 6 months
3. Exercise at least 2×/week
4. All of the above

### Treating Prediabetes and Preventing Diabetes (The Diabetes Prevention Program)

Intensive lifestyle intervention programs that...

Achieve and maintain loss of **7-10%** of initial body weight



Maintain moderate-intensity physical activity at least **150 min/week**



**58%**

Can **reduce the incidence of T2DM by 58%** over 3 years, with sustained reduction in the rate of conversion to T2DM

ADA. *Diabetes Care*. 2019; 42(1):S29-33.

### Physical Activity Recommendations for Adults with T2DM

#### Get Active



Moderate to vigorous intensity physical activity at least **3×/week** (≥150 min/week)



Flexibility and balance training **2-3×/week** for older adults with diabetes



Resistance exercise **2-3×/week**, non-consecutive days

#### Stay Active



No more than 2 consecutive days without exercise



Decrease sedentary time

ADA. *Diabetes Care*. 2018; 41(1):S38-50.

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## Rationale



<input checked="" type="checkbox"/>	150 min/week of brisk walking or exercise of similar intensity	Yes
<input checked="" type="checkbox"/>	Achieve and maintain a minimum of 5% weight loss in 6 months	Achieve and maintain a minimum of 7% weight loss in 6 months
<input checked="" type="checkbox"/>	Exercise at least 2×/week	Exercise at least 3×/week
<input checked="" type="checkbox"/>	All of the above	Incorrect

## Pharmacologic Treatment of Prediabetes

### 2019 ADA

Metformin therapy for prevention of T2DM should be considered in those with prediabetes, especially for those with BMI  $\geq 35$  kg/m<sup>2</sup>, those aged <60 years, and women with prior gestational DM **A**

ADA. *Diabetes Care*. 2019; 42(1):S29-33.

## Metformin



### General benefits:

Effective, low risk of hypoglycemia, promotes weight loss



### CV benefit:

May decrease heart failure hospital readmissions and reduce the risk of cardiovascular events and death



### Side effects:

Nausea, vomiting, diarrhea, abdominal discomfort, dehydration, possible B12 malabsorption, rare lactic acidosis



Obtain eGFR prior to starting. Initiation not recommended if eGFR between 30-45 mL/min/1.73 m<sup>2</sup>

Contraindicated in patients with chronic kidney disease (CKD) and eGFR  $\leq 30$  mL/min/1.73 m<sup>2</sup>

ADA. *Diabetes Care*. 2018;41 (S1):S73-S85; Garber AJ, et al. *Endocr Pract*. 2018;24(1):91-120; Crowley MJ, et al. *Ann Intern Med*. 2017;166(3):191-200; FDA Drug Safety Communication: FDA revises warnings regarding use of the diabetes medicine metformin in certain patients with reduced kidney function 4/08/2016.

## Summary for Patients with Prediabetes



Screen for development of diabetes **at least annually**



Refer to an intensive behavioral lifestyle intervention program modeled on the DPP



- Achieve and maintain **7% loss of initial body weight**



- Moderate-intensity physical activity (such as brisk walking) at **least 150 min/week**



Screen and treat for other CV risk factors

Consider **metformin**

ADA. *Diabetes Care*. 2019; 42(1):S29-33.

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## Audience Response Question



According to the ADA, which of the following is NOT a fundamental aspect of diabetes care?

1. Diabetes self-management education and support (DSMES)
2. Physical activity
3. Referral for bariatric surgery if BMI > 35 kg/m<sup>2</sup>
4. Psychosocial care
5. Smoking cessation

## Answer



According to the ADA, which of the following is NOT a fundamental aspect of diabetes care?

Diabetes self-management education and support (DSMES)

Physical activity

Referral for bariatric surgery if BMI > 35 kg/m<sup>2</sup> Is NOT a fundamental aspect of diabetes care according to the ADA

Psychosocial care

Smoking cessation

## Lifestyle Management of T2DM

Diabetes Self-Management Education and Support (DSMES)

Psychosocial Care

Medical Nutrition Therapy

Smoking Cessation Counseling

Physical Activity

**Fundamental Aspects of Diabetes Care**

ADA. *Diabetes Care*. 2018; 41(1):S38-50.

## Diabetes Self-Management Education Support (DSMES)



All patient should be assessed for:

### Nutrition

With a registered dietitian for medical nutritional therapy

**Education**  
Diabetes self-management education and support

### Emotional Health

With a mental health professional if needed

Powers, et al. *Diabetes Care*. 2015;38:1372-1382.

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## DSMES



### DSMES services have a positive impact on<sup>1</sup>

- ☐ Eating patterns
- ☐ Activity levels
- ☐ HbA1c levels
- ☐ Prevention or delay of diabetes complications
- ☐ Quality of life

### DSMES services can address a patient's<sup>2</sup>

Health beliefs  
Current knowledge  
Cultural needs  
Family support  
Financial status  
Physical limitations  
Emotional concerns  
Medical history  
Health literacy

Other factors that influence their ability to meet the challenges of self-management

1) Powers MA, et al. *J Acad Nutr Diet*. 2015;115(8):1323-1334; 2) Powers MA, et al. *Diabetes Care*. 2015;38(7):1372-1382.

## Psychosocial Care?

**A patient-centered approach including psychosocial care should be provided to ALL people with diabetes**

### Psychosocial screening

- Attitudes about diabetes, expectations, mood and affect, general and diabetes-related QOL, psychiatric history, available resources, more...

### Assess for symptoms of diabetes distress, depression, anxiety, disordered eating, cognitive capacity

- Initially, at intervals, when there a change in patient health or life status

ADA. *Diabetes Care*. 2018; 41(1):S38-50.

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