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

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- 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.

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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.

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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.

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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.

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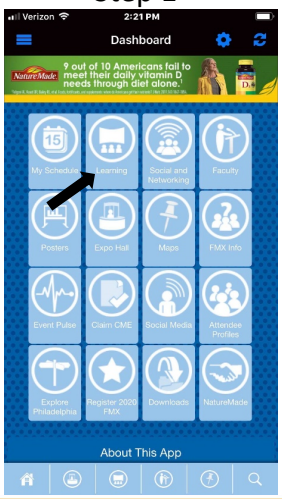
Associated Sessions

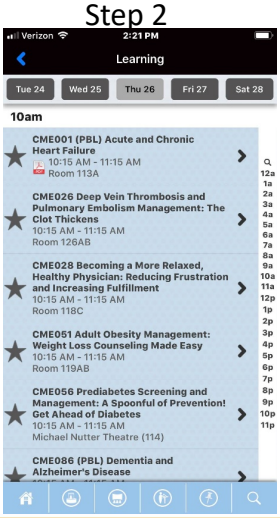
- (PBL) Prediabetes Screening and Management: A Spoonful of Prevention! Get Ahead of Diabetes

Audience Engagement System

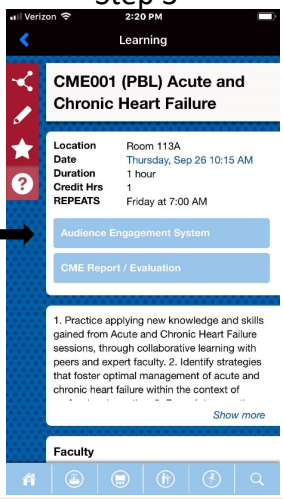
Step 1



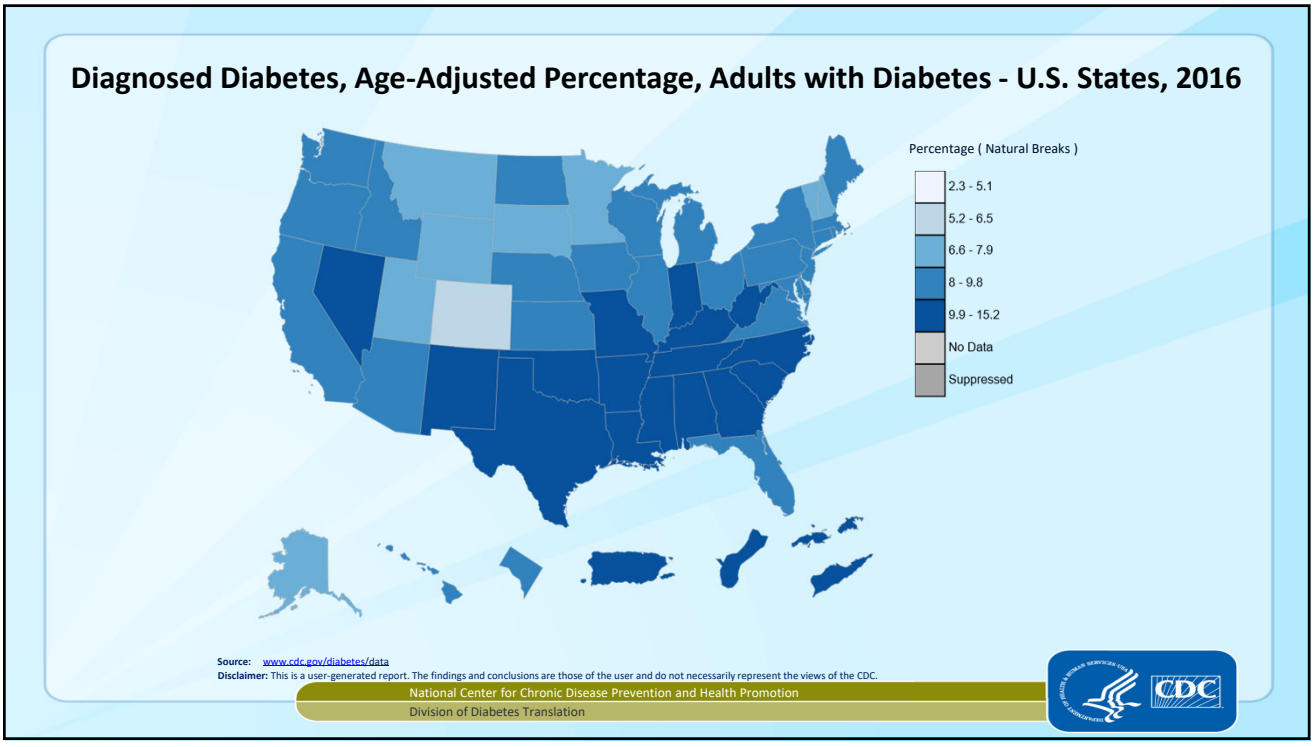
Step 2



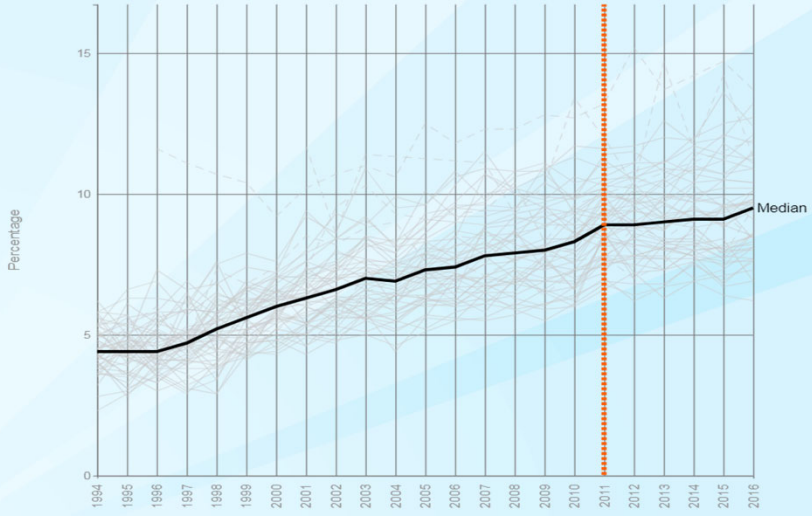
Step 3



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.

National Center for Chronic Disease Prevention and Health Promotion
Division of Diabetes Translation

Prediabetes in the US

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

Characteristic	No. in millions (95% CI)[a]	Percentage (95% CI)[b]	Percentage aware of prediabetes (95% CI)[a,c]
Total	84.1 (78.0–90.4)	33.9 (31.5–36.5)	11.6 (9.9–13.6)

~1 out of **3** adults affected

9 out of **10** are unaware

Centers for Disease Control and Prevention. National Diabetes Statistics Report, 2017. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Dept of Health and Human Services; 2017.

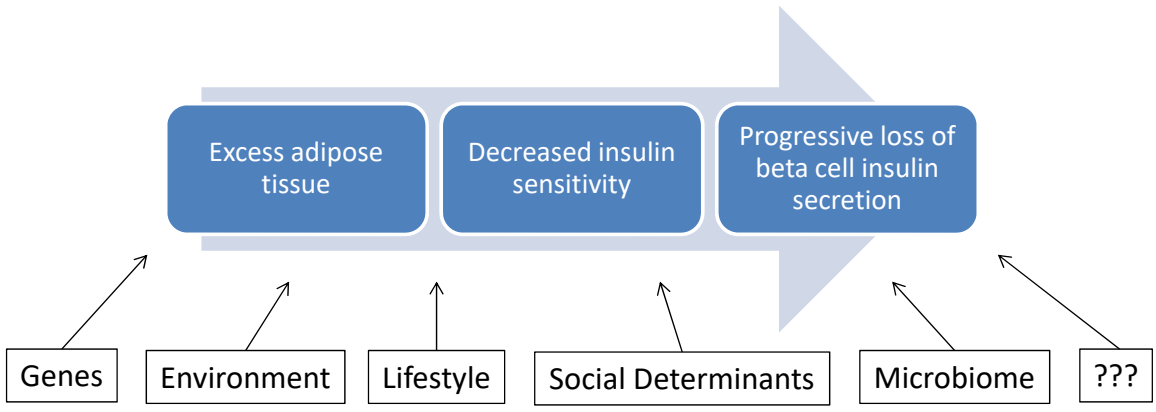
Poll Question #1

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



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

Bellou V, Belbasis L, Tzoulaki I, Evangelou E. Risk factors for type 2 diabetes mellitus: An exposure-wide umbrella review of meta-analyses. *PLoS One*. 2018 Mar 20;13(3):e0194127.

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

Derks IP, Koster A, Schram MT, et al. The association of early life socioeconomic conditions with prediabetes and type 2 diabetes: results from the Maastricht study. *Int J Equity Health*. 2017 Apr 5;16(1):61.

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

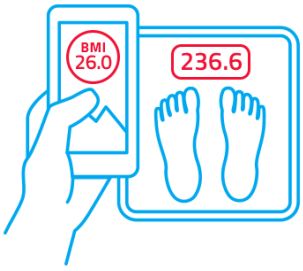
Identification and Screening

Guidelines/Recommendations/Clinical Resources Related to Diabetes Prevention

Organization	Guidelines
United States Preventive Services Task Force	Abnormal Glucose Screening Recommendation (2015)*
American Diabetes Association	Standards of Medical Care in Diabetes (2019)
American Association of Clinical Endocrinologists/American College of Endocrinology	Clinical Practice Guideline for Developing a Diabetes Mellitus Comprehensive Care Plan (2015)
	Comprehensive Type 2 Diabetes Management Algorithm (2019)
Community Preventive Services Task Force	Diabetes Prevention and Control: Combined Diet and Physical Activity Promotion Programs to Prevent Type 2 Diabetes Among People at Increased Risk (2015)
National Diabetes Education Program	Guiding Principles for the Care of People With or At Risk for Diabetes (2018)

**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

U.S. Preventive Services Task Force. Final Recommendation Statement: Abnormal Blood Glucose and Type 2 Diabetes Mellitus: Screening. April 2018. https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/screening-for-abnormal-blood-glucose-and-type-2-diabetes. Accessed March 4, 2019.

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

U.S. Preventive Services Task Force. Final Recommendation Statement: Abnormal Blood Glucose and Type 2 Diabetes Mellitus: Screening. April 2018. https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/screening-for-abnormal-blood-glucose-and-type-2-diabetes. Accessed March 4, 2019.

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

American Diabetes Association. 2.Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes- 2019. *Diabetes Care.* 2019;42(Suppl 1):S13-S28.

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

American Diabetes Association. 2.Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes- 2019. *Diabetes Care.* 2019;42(Suppl 1):S13-S28.

AACE/ACE Clinical Practice Guidelines

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

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

Handelsman Y, Bloomgarden ZT, Grunberger G, et al. American Association of Clinical Endocrinologists and American College of Endocrinology - Clinical Practice Guidelines for Developing a Diabetes Mellitus Comprehensive Care Plan - 2015. *Endocr Pract*. 2015;21(Suppl 1):1-87.

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

Handelsman Y, Bloomgarden ZT, Grunberger G, et al. American Association of Clinical Endocrinologists and American College of Endocrinology - Clinical Practice Guidelines for Developing a Diabetes Mellitus Comprehensive Care Plan - 2015. *Endocr Pract*. 2015;21(Suppl 1):1-87.

Acceptable Laboratory Tests

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

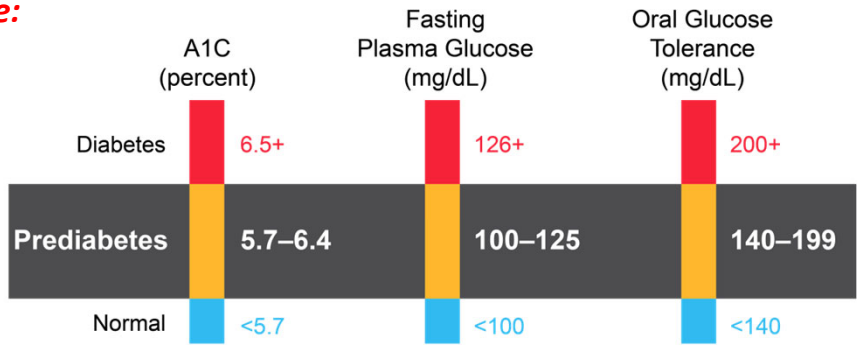
American Diabetes Association. 2.Classification and Diagnosis of Diabetes: Standards of Medical care in Diabetes- 2019. *Diabetes Care.* 2019;42(Suppl 1):S13-S28.
Sacks DB. A1C versus glucose testing: a comparison. *Diabetes Care.* 2011;34(2):518-23.

Management of Abnormal Glucose

Prediabetes Identification

ICD10 code:

R73.03



American Diabetes Association. 2.Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes- 2018. *Diabetes Care.* 2018;41(Suppl 1):S13-S27.

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 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

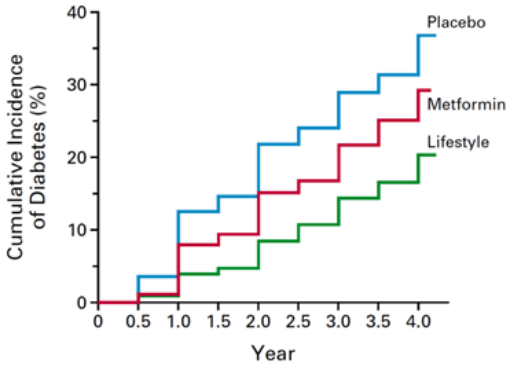


Figure 2. Cumulative Incidence of Diabetes According to Study Group.

Knowler WC, Barrett-Connor E, Fowler SE, et al.; Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med.* 2002;346:393–403.

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

Final Update Summary: Abnormal Blood Glucose and Type 2 Diabetes Mellitus: Screening. U.S. Preventive Services Task Force. September 2016. https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/screening-for-abnormal-blood-glucose-and-type-2-diabete2. Accessed Feb 24, 2019.

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

Programs must deliver approved curriculum and follow national standards

Regular data submission on participant outcomes required for recognition

Key program standard for CDC recognition: Participant body weight loss of 5%

Eligibility for a DPP lifestyle change program

✓ BMI ≥25 (≥23 if Asian American)

AND

✓ One of the following

- ❑ Prediabetes diagnosis

OR

- ❑ History of GDM

OR

- ❑ Elevated risk score (ADA or doihaveprediabetes.org screener)

**do not need a laboratory test; participants can self-refer*

Coverage for DPP lifestyle change programs

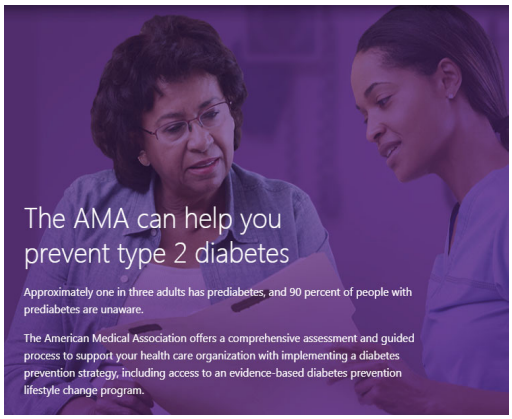
- Medicare coverage began April 2018
- Medicaid coverage in 6 states, with ongoing pilots in 4 states
- State employee coverage in 20 states with 4 pilots
- Growing private insurers offering coverage (Anthem, Cigna)

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



www.amapreventdiabetes.org

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

……..and more to come!

Information about DPP lifestyle change programs

CDC's National Diabetes Prevention Program
https://www.cdc.gov/diabetes/prevention/index.html

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

Kirley K, Sachdev N. Digital Health-Supported Lifestyle Change Programs to Prevent Type 2 Diabetes. *Diabetes Spectr.* 2018 Nov;31(4):303-309.

Metformin

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

Knowler WC, Barrett-Connor E, Fowler SE, et al.; Diabetes Prevention Program Research Group. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. *N Engl J Med.* 2002;346:393–403.

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

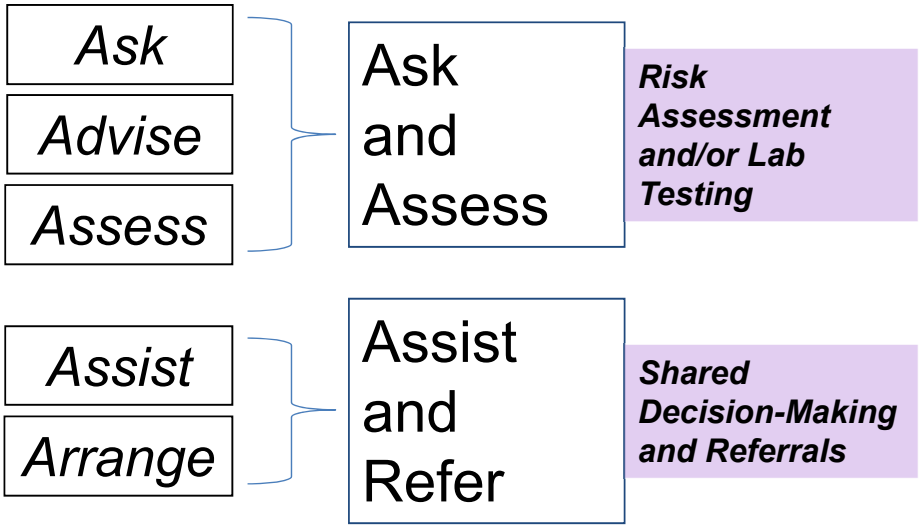
- I'm not really sure what to tell my patients
- Even if I counsel them, my patients still fail to change
- I don't have enough time

Structured Counseling Strategies

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

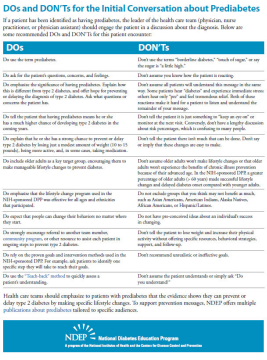
Searight HR. Counseling Patients in Primary Care: Evidence-Based Strategies. *Am Fam Physician*. 2018 Dec 15;98(12):719-728.

Ask/Assess -> Assist/Refer



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



DOs and DON'Ts for the Initial Conversation about Prediabetes

If a patient has been identified as having prediabetes, the leader of the health care team (physician, nurse practitioner, or physician assistant) should engage the patient in a discussion about the diagnosis. Below are some recommended DOs and DON'Ts for this patient encounter:

DOs	DON'Ts
Do use the term prediabetes.	Don't use the terms "borderline diabetes," "touch of sugar," or say the sugar is "a little high."
Do ask for the patient's questions, concerns, and feelings.	Don't assume you know how the patient is reacting.
Do emphasize the significance of having prediabetes. Explain how this is different from type 2 diabetes, and offer hope for preventing or delaying the diagnosis of type 2 diabetes. Ask what questions or concerns the patient has.	Don't assume all patients will understand this message in the same way. Some patients hear "diabetes" and experience immediate stress; others hear only "pre" and feel tremendous relief. Both of these reactions make it hard for a patient to listen and understand the remainder of your message.
Do tell the patient that having prediabetes means he or she has a much higher chance of developing type 2 diabetes in the coming years.	Don't tell the patient it is just something to "keep an eye on" or monitor at the next visit. Conversely, don't have a lengthy discussion about risk percentages, which is confusing to many people.
Do explain that he or she has a strong chance to prevent or delay type 2 diabetes by losing just a modest amount of weight (10 to 15 pounds), being more active, and, in some cases, taking medication.	Don't tell the patient there isn't much that can be done. Don't say or imply that these changes are easy to make.
Do include older adults in a key target group, encouraging them to make manageable lifestyle change to prevent diabetes.	Don't assume older adults won't make lifestyle changes or that older adults won't experience the benefits of chronic disease prevention because of their advanced age. In the NIH-sponsored DPP, a greater percentage of older adults (> 60 years) made successful lifestyle changes and delayed diabetes onset compared with younger adults.
Do emphasize that the lifestyle change program used in the NIH-sponsored DPP was effective for all ages and ethnicities that participated.	Do not exclude groups that you think may not benefit as much, such as Asian Americans, American Indians, Alaska Natives, African Americans, or Hispanic/Latinos.
Do expect that people can change their behaviors no matter where they start.	Do not have pre-conceived ideas about an individual's success in changing.
Do strongly encourage referral to another team member, community program, or other resource to assist each patient in ongoing steps to prevent type 2 diabetes.	Don't tell the patient to lose weight and increase their physical activity without offering specific resources, behavioral strategies, supports, and follow-up.
Do rely on the proven goals and intervention methods used in the NIH-sponsored DPP. For example, ask patients to identify one specific step they will take to reach their goals.	Don't recommend unrealistic or ineffective goals.
Do use the "Teach-back" method to quickly assess a patient's understanding.	Don't assume the patient understands or simply ask "Do you understand."

Health care teams should emphasize to patients with prediabetes that the evidence shows they can prevent or delay type 2 diabetes by making specific lifestyle changes. To support prevention messages, NDEP offers multiple publications about prediabetes tailored to specific audiences.

NDEP National Diabetes Education Program

A program of the National Institutes of Health and the Centers for Disease Control and Prevention

National Diabetes Education Program. Guiding Principles for the Care of People with or at Risk for Diabetes. https://www.niddk.nih.gov/health-information/communication-programs/ndep/health-professionals/game-plan-preventing-type-2-diabetes/how-talk-patients-about-prediabetes-diagnosis/dos-donts-initial-conversation-about-prediabetes. Updated August 2018. Accessed March 4, 2019.

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

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Questions

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