Section 3:

Prevention or Delay of Diabetes and Associated Comorbidities

Screening for Type 2 Diabetes

1. Why Screen?

- Lab testing is safe and cost-effective.
- Screening presents an opportunity to address cardiovascular risk factors (e.g., hypertension and dyslipidemia).

2. How to Screen

- Conduct an informal assessment of risk factors.

–or–

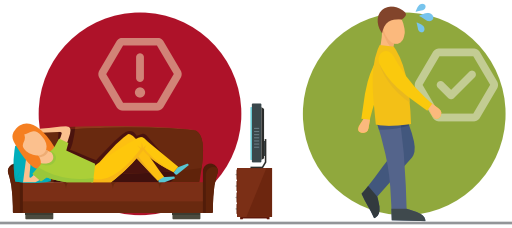
- Use an assessment tool such as the ADA risk test.
- Consider diagnostic testing based on assessment results.

3. When to Screen

- Monitor people with prediabetes at least annually.
- In those without prediabetes who have normal results, repeat screening at least every 3 years.
- Screen after the onset of puberty or after the age of 10 years in children and adolescents with overweight (BMI ≥85th percentile) or obesity (BMI ≥95th percentile) who have at least one risk factor.
- Symptoms suggestive of diabetes or changes in risk

Diet and Physical Activity Recommendations for Adults at Risk for Type 2 Diabetes

Follow a Healthy Eating Pattern	Get Regular Physical Activity
• Emphasize whole grains, legumes, nuts, fruits, and vegetables and minimize refined and processed foods • A variety of healthy eating patterns include: » Mediterranean-style » Low-carbohydrate » Vegetarian or plant-based » DASH (Dietary Approaches to Stop Hypertension)	• ≥150 min/week of moderate-intensity physical activity, such as brisk walking • May include resistance or strength training • Break up prolonged sedentary time



Suggested citation: American Diabetes Association Primary Care Advisory Group. 3. Prevention or delay of diabetes and associated comorbidities: *Standards of Care in Diabetes—2024* abridged for primary care professionals. Clin Diabetes 2024;42:186–188 (doi: 10.2337/cd24-a003)

Where to Refer

- Refer adults with overweight or obesity who are at high risk for type 2 diabetes to a recognized diabetes prevention lifestyle change program (cdc.gov/diabetes/ prevention/ find-a-program.html).

What is the Diabetes Prevention Program?

- The Diabetes Prevention Program (DPP) study demonstrated that intensive lifestyle intervention could reduce the risk of type 2 diabetes by 58% over 3 years. The two major goals of the DPP intensive lifestyle intervention were to achieve and maintain ≥7% weight loss and ≥150 min of moderate-intensity physical activity, such as brisk walking, per week.
- Technology-assisted programs using smartphones, web apps, and telehealth platforms can effectively deliver the DPP lifestyle change program, overcoming barriers, especially for low-income and rural individuals.

Person-Centered Care Goals for Individuals at Risk of Type 2 Diabetes

It is important to weigh the individualized risks and benefits of interventions.		
 Facilitate weight management in those with overweight/obesity.	 Minimize progression of hyperglycemia.	 Reduce cardiovascular risk.

Consider more intensive approaches for individuals at high risk of progression to diabetes.		
 BMI ≥35 kg/m²	 Higher glucose levels (e.g., fasting plasma glucose 110–125 mg/dL [6.1–6.9 mmol/L], 2–h post-challenge glucose 173–199 mg/dL [9.6–11 mmol/L], and A1C ≥6.0% [42 mmol/mol])	 History of gestational diabetes mellitus

What medications can be prescribed to adults to prevent type 2 diabetes?

The U.S. Food and Drug Administration has not approved any drugs for diabetes prevention.

Metformin has the strongest evidence base for diabetes prevention.

Who should be considered for metformin therapy to prevent type 2 diabetes?

- Adults aged 25–59 years with a BMI ≥35 kg/m^2
- Individuals with higher fasting plasma glucose (e.g., ≥110 mg/dL [≥ 6 mmol/L])
- Those with higher A1C (e.g., ≥6.0% [≥42 mmol/mol])
- Individuals with a history of gestational diabetes mellitus

What parameters should be monitoring in people on metformin therapy?

Vitamin B12 should be measured periodically, especially in those with anemia or peripheral neuropathy.

Screening for type 1 diabetes?

1. Screen using autoantibodies
2. In people with preclinical type 1 diabetes, monitor for disease progression using A1C approximately every 6 months and 75-g oral glucose tolerance test (i.e., fasting and 2-h plasma glucose) annually; modify frequency of monitoring based on individual risk assessment based on age, number and type of autoantibodies, and glycemic metrics.

Medication to delay the onset of type 1 diabetes

Teplizumab-mzwv infusion to delay the onset of symptomatic type 1 diabetes should be considered in selected individuals who are ≥8 years of age and have stage 2 type 1 diabetes.

Staging of type 1 diabetes

	Stage 1	Stage 2	Stage 3
Characteristics	• Autoimmunity • Normoglycemia • Presymptomatic	• Autoimmunity • Dysglycemia • Presymptomatic	• Autoimmunity • Overt hyperglycemia • Symptomatic
Diagnostic criteria	• Multiple islet autoantibodies • No IGT or IFG	• Islet autoantibodies (usually multiple) • Dysglycemia: IFG and/or IGT • FPG 100–125 mg/dl (5.6–6.9 mmol/L) • 2-h PG 140–199 mg/dl (7.8–11.0 mmol/L) • A1C 5.7–6.4% (39–47 mmol/mol) or ≥10% increase in A1C	• Autoantibodies may become absent • Diabetes by standard criteria

Adapted from Skyler JS, Bakris GL, Bonifacio E, et al. Differentiation of diabetes by pathophysiology, natural history, and prognosis. Diabetes 2017;66:241–255.. FPG, fasting plasma glucose; IFG, impaired fasting glucose; IGT, impaired glucose tolerance; 2-h PG, 2-h plasma glucose. Alternative additional stage 2 diagnostic criteria of 30-, 60-, or 90-min plasma glucose on oral glucose tolerance test ≥200 mg/dL (≥11.1 mmol/L) and confirmatory testing in those aged ≥ 18 years have been used in clinical trials. Herold KC, Bundy BN, Long SA, et al.; Type 1 Diabetes TrialNet Study Group. An anti-CD3 antibody, teplizumab, in relatives at risk for type 1 diabetes. N Engl JMed 2019;381:603–613.

Does statin therapy increase the risk of developing type 2 diabetes?

- Statin therapy may slightly elevate type 2 diabetes risk in high-risk individuals.
- In primary and secondary prevention of cardiovascular disease, statin benefits outweigh diabetes risk.
- Discontinuing statins based on concerns about increased diabetes risk is not advised.

Does pioglitazone have a role in secondary cardiovascular prevention in people at risk for type 2 diabetes?

Pioglitazone could reduce stroke and myocardial infarction risks in people with a history of stroke and evidence of insulin resistance or prediabetes. However, the benefit must be weighed against potential weight gain, edema, and increased fracture risk. Lower doses may lessen these adverse effects.