# Screening for Type 2 Diabetes

The effectiveness of screening may depend on the setting in which it is performed. In general, community screening outside a health care setting may be less effective because of the failure of people with a positive screening test to seek and obtain appropriate follow-up testing and care or, conversely, to ensure appropriate repeat testing for individuals who screen negative. That is, screening outside of clinical settings may yield abnormal tests that are never discussed with a primary care provider, low compliance with treatment recommendations, and a very uncertain impact on long-term health. Community screening may also be poorly targeted, i.e., it may fail to reach the groups most at risk and inappropriately test those at low risk (the worried well) or even those already diagnosed.

## General Recommendations for the Evaluation of High-Risk Individuals

Based on the lack of data from prospective studies on the benefits of screening and the relatively low cost-effectiveness of screening suggested by existing studies, the decision to test for diabetes should ultimately be based on clinical judgment and patient preference.

On the basis of expert opinion, screening should be considered by health care providers at 3-year intervals beginning at age 45, particularly in those with BMI ≥25 kg/m$^2$. The rationale for this interval is that false negatives will be repeated before substantial time elapses, and there is little likelihood of an individual developing any of the complications of diabetes to a significant degree within 3 years of a negative screening test result. Testing should be considered at a younger age or be carried out more frequently in individuals who are overweight and have one or more of the other risk factors shown in Table 1.

**Table 1—** Risk factors for type 2 diabetes

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| Age ≥45 years |
| Overweight (BMI ≥25 kg/m$^{2*}$) |
| Family history of diabetes (i.e., parents or siblings with diabetes) |
| Habitual physical inactivity |
| Race/ethnicity (e.g., African-Americans, Hispanic-Americans, Native Americans, Asian-Americans, and Pacific Islanders) |
| Previously identified IFG or IGT |
| History of GDM or delivery of a baby weighing >9 lbs |
| Hypertension (≥140/90 mmHg in adults) |

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| HDL cholesterol ≤35 mg/dl (0.90 mmol/l) and/or a triglyceride level ≥250 mg/dl (2.82 mmol/l) |
| Polycystic ovary syndrome |
| History of vascular disease |

[*] *May not be correct for all ethnic groups.*

The incidence of type 2 diabetes in children and adolescents has been shown to be increasing. Consistent with screening recommendations for adults, only children and youth at substantial risk for the presence or the development of type 2 diabetes should be tested. Although there are insufficient data to make definite recommendations, the American Diabetes Association consensus statement titled "Type 2 Diabetes in Children and Adolescents" recommends that overweight (defined as BMI >85th percentile for age and sex, weight for height >85th percentile, or weight >120% of ideal [50th percentile] for height) youths with any two of the risk factors listed below be screened. Testing should be done every 2 years starting at age 10 years or at the onset of puberty if it occurs at a younger age. Testing may be considered in other high-risk patients who display any of the following characteristics:

- Have a family history of type 2 diabetes in first- and second-degree relatives;
- Belong to a certain race/ethnic group (Native Americans, African-Americans, Hispanic Americans, Asians/South Pacific Islanders);
- Have signs of insulin resistance or conditions associated with insulin resistance (acanthosis nigricans, hypertension, dyslipidemia, polycystic ovary syndrome).

The best screening test for diabetes, the fasting plasma glucose (FPG), is also a component of diagnostic testing. The FPG test and the 75-g oral glucose tolerance test (OGTT) are both suitable tests for diabetes; however, the FPG test is preferred in clinical settings because it is easier and faster to perform, more convenient and acceptable to patients, and less expensive.

The A1C test values remain a valuable tool for monitoring glycemia, but it is not currently recommended for the screening or diagnosis of diabetes. Pencil and paper tests, such as the American Diabetes Association's risk test, may be useful for educational purposes but do not perform well as stand-alone tests. Capillary blood glucose testing using a reflectance blood glucose meter has also been used, but because of the imprecision of this method, it is better used for self-monitoring rather than as a screening tool.

## Other Considerations

In screening for disease, it is crucial that an interpretation of the screening test results be provided to the patient and that follow-up evaluation and treatment are made available.

Also, it is important to consider that certain drugs, including glucocorticoids and nicotinic acid, may produce hyperglycemia.

## Community Screening

Although there is ample scientific evidence showing that certain risk factors predispose individuals to development of diabetes, there is insufficient evidence to conclude that community screening is a cost-effective approach to reduce the morbidity and mortality associated with diabetes in presumably healthy individuals. While community screening programs may provide a means to enhance public awareness of the seriousness of diabetes and its complications, other less costly approaches may be more appropriate, particularly because the potential risks are poorly defined. Thus, based on the lack of scientific evidence, community screening for diabetes, even in high-risk populations, is not recommended.

## Summary of Major Recommendations

Recommendations

Evaluation for type 2 diabetes should be performed within the health care setting. Patients, particularly those with a BMI ≥25 kg/m$^{2*}$, should be screened at 3-year intervals beginning at age 45; testing should be considered at an earlier age or be carried out more frequently in those who are overweight if additional diabetes risk factors are present.

The FPG is the recommended screening test. The OGTT may be necessary for the diagnosis of diabetes when the FPG is normal. The FPG is preferred for screenings because it is faster and easier to perform, more convenient, acceptable to patients, and less expensive.

Diagnostic testing should be performed in any clinical situation in which such testing is warranted; health care providers should not consider whether a person meets screening criteria in such cases.

Screening outside of health care settings, or community screening, has not been shown to be beneficial and may result in some harm; this type of screening is not recommended.

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*Diabetes Care* 27:S11-S14, 2004


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