

Diabetes Screening

Guideline: Each person should be evaluated for the risk of diabetes according to the recommendations of nationally recognized health organizations.

The following Guideline is intended to help physicians, nurses, and others involved in clinical decision-making by describing the recommended course of action for Diabetes Screening for individuals served by SCDDSN. As much as possible, the recommendations reflect the strength of evidence and magnitude of net benefit (benefits minus harms) as reported by the U.S. Preventive Services Task Force, the American Diabetes Association, Centers for Disease Control and Prevention, and other nationally recognized health organizations. Decisions about screening for each individual should be based on clinical history, assessment, and other factors unique to the individual.

DEFINITIONS:

Diabetes mellitus: A disease characterized by high levels of blood glucose resulting from defects in insulin production, insulin action, or both. Diabetes can be associated with serious complications and premature death.¹

Fasting: The individual consumes no food or beverage for at least 8 hours prior to laboratory blood tests.²

Health screening: The process of assessing the present health status of an individual through periodic health examinations.

Individual's record: A permanent legal document that provides comprehensive information about the individual's health care status.

Medical progress notes: The section of the individual's record where primary care providers document their findings and provide rationale for treatment plans.

Prediabetes: A term used to distinguish people who are at increased risk of developing diabetes. People with prediabetes have impaired fasting glucose (IFG) or impaired glucose tolerance (IGT).¹

Primary care providers: Physicians, nurse practitioners, and physician assistants who provide primary care services and are authorized to prescribe medications and treatments for people on their assigned caseloads.

Risk factor: Anything that increases a person's chance of getting a disease. However, when a person develops a disease, it is not possible to say with certainty that a particular risk factor was the cause.

Type 1 diabetes: A disease caused by a deficiency of insulin. Five percent of diabetics have type 1 diabetes. This form of diabetes usually strikes children and young adults, although disease onset can occur at any age. Type 1 diabetes was previously called insulin-dependent diabetes mellitus (IDDM) or juvenile onset diabetes.¹

Type 2 diabetes: A disease that usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce insulin. Type 2 diabetes is associated with older age, obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity, and race/ethnicity. Type 2 diabetes is increasingly being diagnosed in children and adolescents. Type 2 diabetes was previously known as non-insulin dependent diabetes mellitus (NIDDM) or adult onset diabetes.¹

RATIONALE:

1. The purpose of health screening is to identify persons at high risk for specific conditions and to provide early detection and intervention for asymptomatic persons with health conditions.
2. Diabetes can affect many parts of the body and can lead to serious complications such as blindness, kidney damage, lower-limb amputation, and premature death from heart disease and stroke.
3. Treatment for diabetes is most successful when symptoms are detected and treated early.
4. Diabetes is the nation's 7th leading cause of death.¹

EXPECTED OUTCOMES:

1. Staff should be aware of the warning signs of diabetes.¹
 - a. **Type 1 diabetes:** The symptoms usually develop over a short period of time and include:
 1. increased thirst and urination
 2. constant hunger
 3. weight loss
 4. blurred vision
 5. extreme fatigue
 6. nausea, vomiting or stomach painIf not diagnosed and treated with insulin, a person with type 1 diabetes can lapse into a life threatening diabetic coma, known as diabetic ketoacidosis.
 - b. **Type 2 diabetes:** The symptoms develop gradually and their onset is not as sudden as type 1 diabetes. Symptoms of type 2 diabetes are no less important than symptoms of type 1 diabetes and should receive prompt medical attention. Some people, however, have no symptoms. Symptoms may include:
 1. Fatigue
 2. frequent urination
 3. unusual thirst
 4. extreme hunger
 5. weight loss
 6. sudden vision changes
 7. tingling or numbness in hands or feet
 8. very dry skin
 9. frequent infections, and
 10. slow healing of wounds or sores.¹
2. Changes in a person's appearance, activity-level, or behavior that may suggest any early signs or symptoms of diabetes should be reported promptly to health personnel. The nurse should document reported information and observations in the nursing notes.
3. Prompt and thorough follow-up should be completed and documented when signs and/or symptoms of diabetes are detected.
 - a. The medical plan of care should be documented in the medical progress notes.
 - b. Nursing strategies, interventions, and follow-up should be documented in the nursing notes.

Screening Guidelines for Diabetes³

Type 1 diabetes

1. Most cases of type 1 diabetes are detected soon after onset of symptoms.
2. Widespread clinical testing of asymptomatic individuals is not recommended to identify people at risk.

Type 2 diabetes

1. Screening for abnormal blood glucose as part of cardiovascular risk assessment in adults aged 40 to 70 years who are overweight or obese.
2. Rescreening every 3 years should be considered for adults with normal blood glucose levels.
3. Glucose abnormalities can be detected by measuring hemoglobin A1c or fasting plasma glucose or with an oral glucose tolerance test. Diagnosis of IFG, IGT, or type 2 diabetes should be confirmed with repeated testing (the same test on a different day is the preferred method of confirmation).
4. The A1c test measures the amount of glucose in a person's blood over a 2 to 3 month period and is a tool to monitor diabetes. Higher levels of hemoglobin A1c may mean that a person's diabetes is out of control.
5. Individuals with abnormal blood glucose should be engaged in behavioral counseling interventions to promote a healthful diet and physical activity.
6. The following table provides values for normal glucose metabolism, impaired glucose, and type 2 diabetes.

Test Values for Normal Glucose Metabolism, IFG or IGT, and Type 2 Diabetes⁴

Test	Normal	IFG* or IGT**	Type 2 Diabetes
Hemoglobin A_{1c} level %	<5.7	5.7 – 6.4	≥6.5
Fasting plasma glucose level			
<i>mmol/L</i>	<5.6	5.6 – 6.9	≥7.0
<i>mg/dL</i>		100 - 125	≥126
Oral Glucose Tolerance Test (OGTT) after 2 hours			
<i>mmol/L</i>	7.8	7.8 – 11.0	≥11.1
<i>mg/dL</i>		140 - 199	≥200

*Impaired Fasting Glucose

**Impaired Glucose Test

Risk Factors for Diabetes^{1,3,5}

Type 1 diabetes

The following factors increase the risk of people having type 1 diabetes:

1. Genetic factors/family history
2. Diseases of the pancreas
3. Infection or illness that damaged the pancreas

Risk Factors for Diabetes cont'd

Type 2 diabetes

The following factors increase the risk of people having type 2 diabetes:

1. 45 years old or older
2. Obesity or being overweight
3. Family history of diabetes
4. Genetic predisposition (having a genetic makeup that makes one more likely to develop diabetes)
5. High risk based on race/ethnicity:
 - a. African Americans
 - b. Hispanic/Latino Americans
 - c. Native Americans
 - d. Asian Americans, Pacific Islanders, Alaska natives
6. Impaired glucose tolerance
7. Insulin resistance
8. High blood pressure (over 140/90)
9. Low levels of HDL (good cholesterol) and high levels of triglycerides
10. History of gestational diabetes
11. Polycystic ovary syndrome
12. Physical inactivity

Complications of Diabetes⁶

1. Heart disease and stroke

- a. Heart disease is the leading cause of diabetes-related deaths.
- b. Adults with diabetes have heart disease death rates 1.7 times higher than adults without diabetes.
- c. The risk for stroke is 2-4 times higher in people with diabetes.
- d. About 65% of deaths among people with diabetes are due to heart disease and stroke.

2. High blood pressure

About 71% of adults with diabetes have blood pressure greater than or equal to 140/90 or use prescription medication for higher pressure.

3. Blindness

- a. Diabetes is the leading cause of new cases of blindness in adults 20 to 74 years old.
- b. Diabetic retinopathy – 28.5% of people with diabetes mellitus aged 40 or older had diabetic retinopathy

4. Kidney disease

Diabetes is the leading cause of end-stage renal disease, accounting for about 44% of new cases.

5. Nervous system disease

- a. About 60% to 70% of people with diabetes have mild to severe forms of nervous system damage which often includes impaired sensation or pain in the feet or hands, slowed digestion of food in the stomach, carpal tunnel syndrome, and other nerve problems.

Nervous system disease cont'd

- b. Almost 30% of people with diabetes aged 40 years or older have impaired sensation in the feet.
 - c. Severe forms of diabetic nerve disease are a major contributing factor of lower extremity amputations.
6. **Amputations**
More than 60% of non-traumatic lower limb amputations in the United States occur among people with diabetes.
7. **Dental disease**
a. Periodontal disease is more common among people with diabetes.
b. Almost one third of people with diabetes have severe periodontal disease.
8. **Complications of pregnancy**
Poorly controlled diabetes before conception and during the first trimester can cause major birth defects in 5% to 10% of pregnancies and spontaneous abortions in 15% to 20 % of pregnancies.
9. **Other complications**
a. People with diabetes are more susceptible to other illnesses such as pneumonia and influenza than people who do not have diabetes.
b. Diabetes can cause life-threatening events such as diabetic ketoacidosis and hyperosmolar nonketotic coma.
c. People with diabetes are twice as likely to have depression.

REFERENCES

1. Centers for Disease Control and Prevention (March 31, 2015). Basics About Diabetes. <http://www.cdc.gov/diabetes/basics/diabetes.html>
2. WebMD (September 2, 2014) Diabetes Health Center – Glossary of Diabetes Terms. <http://www.webmd.com/diabetes/guide/diabetes-glossary-terms?page=2>
3. US Preventive Services Task Force (October 2015). Abnormal Blood Glucose and Type 2 Diabetes Mellitus: Screening. <http://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/screening-for-abnormal-blood-glucose-and-type-2-diabetes>
4. Centers for Disease Control and Prevention (July 29, 2014). Laboratory Quality Assurance and Standardization Programs. http://www.cdc.gov/labstandards/diabetes_measurements.html
5. WebMD (September 2, 2014) Diabetes Health Center. <http://www.webmd.com/diabetes/guide/risk-factors-for-diabetes>
6. Centers for Disease Control and Prevention. (2014). *National Diabetes Statistics Report: Estimates of Diabetes and Its Burden in the United States*. Atlanta, GA: U.S. Department of Health and Human Services; 2014. <http://www.cdc.gov/diabetes/pubs/statsreport14/national-diabetes-report-web.pdf>