

RECOMMENDATIONS FOR DIABETES SCREENING PROGRAMS

INTRODUCTION

The goal of a diabetes screening program is to identify undiagnosed asymptomatic individuals at high risk for developing Type 2 diabetes mellitus. Type 2 diabetes accounts for about 90% of all diagnosed cases. This form of the disease is often present without symptoms for many years. Individuals indicating they have any physical symptoms of diabetes (below) should be referred to a physician immediately. Symptoms include

- ◆ Polyuria
- ◆ Polydipsia
- ◆ Blurred vision
- ◆ Weight loss, sometimes with polyphagia

The most common cause of death among persons who have diabetes in the United States is coronary heart disease. Risk factors for coronary heart disease (i.e. high blood pressure [$>140/90$], lipid abnormalities) are more commonly observed in individuals with diabetes than in the general population.

Population groups at risk for Type 2 diabetes can reduce their cardiovascular disease risk by controlling obesity (with increased physical activity and a low-calorie, low-fat, high-fiber diet) (see weight chart, page A-10); high blood pressure, and high blood cholesterol, and stopping smoking. These lifestyle changes are equally important in reducing diabetes risk.

OBJECTIVES

An effective diabetes screening program will:

- ◆ Increase Iowans' knowledge of diabetes symptoms and risk factors
- ◆ Increase Iowans' awareness of diabetes as a risk factor for coronary heart disease
- ◆ Encourage Iowans with high blood glucose to seek professional advice and follow-up.

SCREENING RECOMMENDATIONS

Consider the following points in planning community diabetes screening programs:

Screening for elevated blood glucose should never be done except as a component of a comprehensive cardiovascular screening program. Identification of high risk individuals should be made using the risk assessment test (Page A-6) with referral to a physician for those scoring 10 or above. If glucose screening is performed, adherence to guidelines for administering the appropriate test and for referrals/recommendations is essential.

Only individuals identified as at-risk for Type 2 diabetes after completing the Diabetes Risk Test (see Appendix A) should be screened for elevated blood glucose levels. Individuals should have fasted (no food or beverage other than water) for a minimum of eight (8) hours before testing.

Community diabetes screening is not appropriate for children, adolescents, or other individuals at risk for Type 1 diabetes; pregnant women; the general public (individuals not identified as at-risk); or individuals with diagnosed diabetes. These individuals should be evaluated and monitored by a physician.

You may screen for elevated blood glucose with either a Fasting Plasma Glucose (venipuncture) or Fasting Capillary Blood Glucose (home/fingerstick) test. Fasting Plasma Glucose testing is more accurate and is the preferred test.

Education programs for health care providers, parents, and the general public should be implemented to increase awareness of clinical signs and symptoms of Type 2 diabetes.

RECRUITMENT STRATEGIES

High risk groups for Type 2 diabetes are:

1. Individuals previously identified as having impaired glucose tolerance.
2. Individuals diagnosed as having hypertension.
3. Individuals with an HDL-cholesterol level ≤ 35 mg/dl and/or a triglyceride level ≥ 250 mg/dl.
4. Women who have a history of gestational diabetes mellitus or have delivered a baby weighing over 9 pounds.

The major risk factors for Type 2 diabetes are:

1. Family history - parents or siblings with diabetes.
2. Obesity - $> 20\%$ over ideal body weight (refer to weight chart, A-10).
3. Race/Ethnicity - Native American, African-American, Hispanic, or Pacific Islander.
4. Age - over 45 with any of the risk factors listed above.

DETECTION

Test to be Used

The fasting plasma glucose test is the preferred method of identifying individuals with elevated blood glucose. Individuals to be tested should have had no food or beverage other than water for at least 8 hours before testing. A fasting plasma glucose level > 126 mg/dl indicates the need for diagnostic testing. Individuals with plasma glucose levels < 126 mg/dl should be retested within three years if they are still at-risk.

You may screen at-risk individuals with a Fasting Capillary Blood Glucose (home) test. Note, however, that this test is less accurate. Individuals with fasting capillary blood glucose levels ≥ 110 mg/dl should be referred to a physician for diagnostic testing. The Fasting Capillary Blood Glucose test may not be considered the first step in diagnosis.

Some medications including glucocorticoids, furosemide, thiazides, estrogen-containing products, beta-blockers, and nicotinic acid may produce hyperglycemia.

Procedure for Screening

1. Inform participants that today's test detects higher than normal blood sugar levels, but does not diagnose diabetes. Explain that they will be referred to a physician for diagnostic testing if necessary.
2. Identify at-risk individuals by having each participant complete the "Diabetes Risk Test" (Appendix A-6).
3. Determine the participant's fasting status, and test only if the participant has had no food or beverage (other than water) for 8 hours.

Infection Control/Blood Precautions

Diabetes screening is an invasive procedure. Your agency should develop policies and procedures for handling blood and blood contaminants. The local board of health, public health nursing agency and/or members of the local medical community can assist you with policy development.

Principles for developing infection control and blood precaution policies for a cardiovascular screening program can be found in section IV of this guide.

EDUCATION

All participants should be given verbal and written information about diabetes by knowledgeable health professionals.

To ensure a useful diabetes screening experience, all participants should be provided education on

1. The need to identify and limit screening to those individuals at risk for Type 2 diabetes mellitus;
2. Diabetes risk factors;
3. The need for follow-up blood glucose measurement by a physician before diagnosis of diabetes.
4. The relationship of diabetes to coronary heart disease.

The Bureau of Health Promotion has developed teaching guidelines (Appendix B) and fact sheets for diabetes screening (Appendix C). Limited copies may be obtained by contacting the Iowa Substance Abuse Information Center at 800/247-0614.

Individuals with readings in the referral criteria range will require more formal individualized education. Participants in your blood glucose screening program should complete a Participant Screening Form and a Diabetes Risk Test to identify risk factors for diabetes and cardiovascular disease. Completing these forms will help you recommend appropriate lifestyle changes for those at risk but not testing in the referral range.

Individuals with diagnosed diabetes should not participate in your diabetes screening program, but may participate in your cardiovascular screening program. Participants with elevated blood pressure or blood cholesterol and diabetes require additional education.

REFERRAL

Blood glucose testing at a screening site does not result in diagnosis. Participants should be given their blood glucose reading and recommended follow-up. Those whose tests are in the normal range should be advised to be tested at 3 year intervals unless they develop symptoms.

The following criteria should be used to evaluate screening results:

Fasting Plasma glucose test (no food or beverage, other than water, for at least eight hours preceding the test):

< 126 mg/dl Retest in three years based on results of new Diabetes Risk Test.

> 126 mg/dl Refer to physician for diagnostic testing.

Fasting Capillary blood glucose Test (no food or beverage, other than water, for at least eight hours preceding the test):

> 110 mg/dl Refer to physician for diagnostic testing.

FOLLOW-UP

You should develop follow-up procedures to ensure that the majority of screenees referred to a physician actually seek medical evaluation. Telephone calls, mailings, and direct participant contacts are effective follow-up strategies. Results of follow-up contacts can be used in evaluating your screening program.

QUALITY ASSURANCE

Staff in a quality diabetes screening program must be adequately trained, demonstrate competency in the testing procedure employed, and know the program policies and procedures. Screening program personnel should be able to

- administer a risk assessment questionnaire;
- perform the Fasting Plasma Glucose and/or Fasting Capillary Blood Glucose test;
- collect and distribute screening test data;
- follow infection control procedures;
- follow waste disposal procedures;
- appropriately refer participants; and
- educate participants based on results of screening procedures.

COMPLETION OF CARDIOVASCULAR RISK REDUCTION SCREENING FORMS

We encourage you to use Cardiovascular Risk Reduction Program Screening forms developed by IDPH in your screening programs. Samples of the forms and instructions for their use are in Appendix A.

REFERENCES

American Diabetes Association. Position Statement Clinical Practice Recommendations: Screening for Type 2 Diabetes. *Diabetes Care*, 21(suppl.1):20-22, 1998.

American Diabetes Association. *Diabetes Alert*, 1998.

DIABETES SCREENING TEACHING GUIDELINES

Objectives

To provide a useful diabetes screening experience, educate participants on the following:

1. The need to identify individuals at risk for diabetes mellitus and screen only those individuals.
2. Diabetes risk factors.
3. Symptoms of diabetes.
4. Enhance awareness of the seriousness of diabetes and its complications.
5. The need for follow-up blood glucose measurement by a physician to diagnose diabetes.
6. Diabetes as a risk factor for coronary heart disease.

Suggested Teaching Outline

1. Who should be screened for diabetes?

Approximately 6% of the general population have diagnosed diabetes. Another 6% of the population have undiagnosed diabetes. Certain specific population groups have a higher prevalence of the disease than the population as a whole. These population groups have risk factors that either directly cause diabetes or are associated with it.

The major objective of a community-screening program is to identify individuals at high risk for having undiagnosed diabetes. Use of a verbal or written diabetes risk test or questionnaire is essential, with those identified to be at high risk referred to a physician. The correlation of a risk factor with the development of diabetes is never 100%. The greater the number of risk factors an individual exhibits, the greater his/her risk of developing diabetes. Random diabetes screening of the general population is not likely to detect asymptomatic individuals with diabetes. Screening only high risk groups increases the likelihood of detecting individuals with undiagnosed diabetes.

Individuals with classic symptoms of diabetes should be referred to a physician.

- ◆ Polyuria
- ◆ Polydipsia
- ◆ Weight loss, sometimes with polyphagia
- ◆ Blurred vision

The main goal of a diabetes screening program is to identify asymptomatic individuals with Type 2 diabetes mellitus because the disease often progresses without symptoms for many years. About 90% of all diagnosed cases of diabetes are Type 2.

Only persons identified as “at risk” currently or in the future should be screened at a community-based diabetes screening program.

2. Who is at risk for diabetes?

The major risk factors for Type 2 diabetes mellitus are

- Family history - parents or siblings with diabetes;
- Obesity - > 20% over normal body weight;
- Race - American Indian, Hispanic, African-American; or Asian/Pacific Islander;
- Age - over 45years of age with any of the risk factors listed above.

“At risk” groups for Type 2 diabetes mellitus are

- Individuals with previously identified impaired glucose tolerance
- Individuals with diagnosed hypertension or significant hyperlipidemia (cholesterol > 240 mg/dl or triglycerides > 250 mg/dl);
- A woman with a history of gestational diabetes mellitus or delivery of a baby weighing more than 9 pounds.

3. How is diabetes diagnosed?

Blood glucose testing at a screening site does not constitute diagnosis. Diagnosis is made on the basis of additional testing by a physician on a subsequent day. Each participant should be given his/her blood glucose test result and advised of the need for periodic measurement, if currently normal. Use the following criteria to evaluate screening results:

Fasting capillary blood glucose test (no food or beverage, other than water, for at least 8 hours before testing):

< 110 mg/dl Retest in 3 years if participant still has one or more diabetes risk factor(s).

≥ 110 mg/dl Refer to physician for diagnostic testing.

Fasting plasma glucose test (no food or beverage, other than water, within 8 hours before testing):

≥ 126 mg/dl Refer to physician for diagnostic testing.

4. What is the relationship of diabetes to coronary heart disease risk?

The most common cause of death among persons with diabetes in the United States is coronary heart disease. Risk factors for coronary heart disease (i.e. high blood pressure, lipid abnormalities) are more commonly observed in people with diabetes than in the general population.

To reduce the risk of cardiovascular disease in individuals identified as “at risk” for diabetes, it is important to control weight, high blood pressure, high blood cholesterol, and stop smoking. These are the same lifestyle changes important in reducing diabetes risk.

*SPECIAL EDUCATIONAL CONSIDERATIONS FOR PERSONS WITH DIABETES:
Many communities have outpatient diabetes education programs. If available in your area, individuals diagnosed with diabetes should be referred to such a program.*

IOWA DEPARTMENT OF PUBLIC HEALTH
Participant Result
Blood Glucose Screening

Type of Blood Glucose Test

_____ Fasting Plasma Glucose (No food or beverage, other than water, for at least 8 hours before testing).

Your Test Results _____ mg/dl

_____ Normal (<126 mg/dl)

_____ Above Normal (\geq 126 mg/dl) → Contact your doctor to determine need for further testing.

_____ Fasting Capillary Blood Glucose (No food or beverage, other than water, for at least 8 hours before testing).

Your Test Results _____ mg/dl

_____ Normal (<110mg/dl)

_____ Above Normal. (\geq 110 mg/dl) → Contact your doctor to determine need for further testing.

Participant Name: _____

Date: _____

Screening Agency: _____

Instructions

Place a checkmark in the space provided before the name of the test your agency performed.

Write the participant's blood glucose result in the provided space that corresponds to the test performed.

Place a checkmark in the space before the appropriate action based on the participant's test result. Educate and refer the participant based on the suggested action.

Write in the participant's name and date, and your agency's name.

Give the form to the participant during the education and referral phase of your screening program.

AT-RISK WEIGHT CHART

Height feet/inches without shoes	Weight pounds without clothing
4'10"	129
4'11"	133
5'0"	138
5'1"	143
5'2"	147
5'3"	152
5'4"	157
5'5"	162
5'6"	167
5'7"	172
5'8"	177
5'9"	182
5'10"	188
5'11"	193
6'0"	199
6'1"	204
6'2"	210
6'3"	216
6'4"	221

If you weigh the same or more than the amount listed for your height, you may be at risk for diabetes. This chart is based on a measure called the Body Mass Index (BMI). The chart shows unhealthy weights for men and women age **35 or older** at the listed heights. At-risk weights are lower for individuals under age 35.

Source: American Diabetes Association. Diabetes Alert, 1998.

DIABETES RISK TEST

ARE YOU AT RISK? TAKE THIS TEST. KNOW THE SCORE.

Find out if you are at risk for having diabetes NOW. Write in the points next to each statement that is true for you. If a statement is not true, put a zero. Then add your total score.

- My weight is equal to or above that listed in the chart. Yes 5
- I am under 65 years of age and I get little or no exercise during a usual day. Yes 5
- I am between 45 and 64 years of age. Yes 5
- I am 65 years old or older. Yes 9
- I am a woman who has had a baby weighing more than nine pounds at birth. Yes 1
- I have a sister or brother with diabetes. Yes 1
- I have a parent with diabetes. Yes 1

TOTAL _____

IF YOU SCORED 3-9 POINTS

You are probably at low risk for having diabetes now. But don't just forget about it - especially if you are Hispanic, African American, American Indian, Asian American, or Pacific Islander. You may be at higher risk in the future. Guidelines recommend everyone age 45 and over should consider being tested for the disease every three years. However, people at high risk should consider being tested at a younger age.

IF YOU SCORED 10 OR MORE POINTS

You are at high risk for having diabetes. Only a doctor can determine if you have diabetes. See a doctor soon and find out for sure.

Source: American Diabetes Association. Diabetes Alert, 1998.