

DIABETES



NORTH CAROLINA FARMWORKER HEALTH PROGRAM

Office of Research, Demonstrations, and Rural Health Development
Department of Health and Human Services

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DIABETES

Self-Assessment

(to be completed before reading Diabetes content)

1. In people with diabetes, which of the following is at higher-than-normal levels in the blood?
 - a. water
 - b. glucose
 - c. sodium

 2. Which hormone is important in diabetes and helps cells absorb glucose?
 - a. insulin
 - b. glucagon
 - c. oxytocin
 - d. testosterone

 3. In which type of diabetes does the body stop producing enough insulin?
 - a. type I
 - b. type II
 - c. type III
 - d. type IV

 4. What is the most common type of diabetes?
 - a. type I
 - b. type II
 - c. type III
 - d. type IV

 5. Which of the following is not a possible complication of diabetes?
 - a. diabetic ketoacidosis
 - b. cardiovascular disease
 - c. nerve damage
 - d. Alzheimer's disease
 - e. digestive problems
 - f. sexual dysfunction

 6. Which of the following may indicate that someone has undiagnosed diabetes?
 - a. frequent urination
 - b. increased thirst
 - c. darkened skin folds
 - d. all of the above
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7. Which of the following is not a risk factor for developing type II diabetes?
 - a. under age 20
 - b. obesity
 - c. high blood pressure
 - d. high cholesterol
 - e. history of cardiovascular disease

8. Which of the following is an appropriate treatment for diabetes?
 - a. dietary modification
 - b. aerobic exercise
 - c. medications that reduce blood glucose levels
 - d. insulin therapy
 - e. all of the above

9. In general, how often should people with diabetes who are doing well see a health care professional for follow-up?
 - a. once a year
 - b. at least once every three to six months
 - c. at least once a month
 - d. at least once a week

Answers: 1(b), 2(a), 3(a), 4(b), 5(d), 6(d), 7(a), 8(e), 9(b)

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Supporting Information for Outreach Workers

What is diabetes, and why does it occur?

Diabetes is a disease that occurs in individuals whose bodies become unable to control the sugar levels in their blood appropriately. When people eat and digest food, the body breaks down the food into molecules that circulate in the bloodstream. These molecules are absorbed by cells and used for energy production and growth. Glucose, which may also be referred to as blood sugar, is an especially important molecule which many cells need to be able to carry out their normal functions. To allow these cells to absorb glucose from the bloodstream, the body also produces a hormone called insulin. If the body stops producing enough insulin or the cells that absorb glucose become resistant to insulin, glucose will not be removed from the bloodstream, causing high blood sugar (glucose) levels. This condition is referred to as diabetes mellitus, or more commonly, just diabetes. Diabetes may cause abnormalities in the way the body uses fats for energy as well. Once an individual develops diabetes, it can be treated to reduce or delay the development of complications, but the disease cannot be cured. Although diabetes may run in families due to genetic factors, it is not a contagious disease and thus cannot be passed from person to person.

There are two main types of diabetes: type I and type II. Type I diabetes, which is also called insulin-dependent diabetes mellitus (IDDM), is caused when the body stops producing enough insulin. About 10% of people with diabetes have Type I diabetes, which is usually diagnosed before age 20. This type of diabetes is caused when the body attacks its own insulin-producing cells and is not related to obesity or a family history of insulin resistance. It often occurs in thin- to normal-weight people, and although its development may be affected by environmental factors, it generally cannot be prevented by lifestyle modifications. The life expectancy of people diagnosed with type I diabetes before age 30 is 10-15 years less than that of the general population, usually due to kidney failure or heart disease.

Type II diabetes, which is also called non-insulin-dependent diabetes mellitus (NIDDM), is caused when cells become resistant to insulin and fail to remove the appropriate amount of glucose from the blood. About 90% of people with diabetes have type II diabetes. It has traditionally occurred primarily in individuals over age 40, although type II diabetes is now developing more often in younger adults and children because of an increase in the prevalence of obesity, which is a significant risk factor. If cells have developed some resistance to insulin, but the resistance is not severe enough to be classified as diabetes, an individual may be diagnosed with impaired glucose tolerance (pre-diabetes) which can later develop into type II diabetes. The life expectancy in individuals with type II diabetes is about one-third less than individuals of the

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same age (e.g. a healthy 40-year-old might expect to live to age 85, whereas a 40-year-old with diabetes might only expect to live to age 70).

Diabetes is much more common than many people realize. The prevalence of diabetes for various groups within the United States in 2005 is listed below: (source: National Diabetes Statistics – National Diabetes Information Clearinghouse (NDIC))

Group	Prevalence
All U.S. residents	7%
People under age 20	0.22%
People age 20 or older	9.6%
People age 60 or older	20.9%
Men over age 20	10.5%
Women over age 20	8.8%
Non-Hispanic whites	8.7%
Non-Hispanic blacks	13.3%
Mexican Americans	9.5%
American Indians and Alaskan Natives	~15.1%

What can happen if diabetes is not treated appropriately?

Diabetes was the sixth leading cause of death listed on U.S. death certificates in 2002, even though it is likely to be underreported as a cause of death. It is a serious disease that can have many complications if it is not kept under control. Two conditions that may occur in undiagnosed or untreated diabetes due to high blood sugar levels are diabetic ketoacidosis or non-ketotic hyperglycemia. These conditions can be life-threatening and must be treated immediately. Initial symptoms may include increased urination, increased thirst, and unintended weight loss, and as the condition worsens, individuals may develop visual changes, seizures, dizziness, confusion, nausea/vomiting, abdominal pain, and coma. An individual with these symptoms should seek medical care immediately.

The most common chronic medical conditions that can be caused or worsened by diabetes are cardiovascular (heart and blood vessel) disease and diabetic neuropathy (damage to the nerves). Two out of every three people with diabetes die from heart disease or stroke. Diabetic neuropathy can cause pain, numbness, tingling, or weakness, especially in the feet and hands, and may also cause digestive problems, urinary problems, sexual dysfunction, dizziness or faintness, increased or decreased sweating, and visual changes. Other common complications of diabetes include the following:

- Eye damage and vision problems: may eventually cause blindness
 - Kidney damage: may result in kidney failure
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- Foot problems due to nerve damage or poor circulation: may result in foot ulcers or gangrene
- Skin problems: may include more frequent bacterial or fungal infections, itching, development of darkened, brown, or scaly patches, loss of sensation, rashes, bumps, and blisters
- Gastroparesis: nerve damage causes delay of stomach emptying, possibly resulting in heartburn, nausea, vomiting, abdominal bloating, and reflux
- Dry mouth, tooth decay, and gum disease
- Depression

What are some symptoms or signs that may indicate that a person has diabetes?

A symptom is something that an individual can feel but that cannot be directly observed by another person, like nausea, and a sign is something that can be directly observed and recorded by another person, like weight loss. Many of the symptoms or signs present in undiagnosed or untreated diabetes are due to the complications described above. Frequent urination, increased thirst, and unintended weight loss are more commonly seen in type I diabetes. People with type II diabetes may have no symptoms initially but can develop visual difficulties, unexplained numbness or tingling, and darkened skin folds. They may also be more susceptible to frequent infections.

Who should be screened or tested for diabetes?

Anyone with the symptoms listed above, especially excessive thirst, frequent urination, unintended weight loss, blurred vision, or fatigue, should be tested for diabetes. People who do not have any symptoms may be screened once every three years if it is determined that they may be at increased risk for developing diabetes based on known risk factors for type II diabetes. All individuals age 45 and above should be screened. Also, anyone with two or more of the following risk factors should be screened, as well as anyone with a high-risk ethnicity (African-American, Hispanic-American, Native American, Pacific-American, or Pacific Islander) who also has one of the following risk factors for developing type II diabetes:

- Overweight (BMI 25 or above)
 - Parent, sibling, or child has diabetes
 - Sedentary lifestyle (does not exercise)
 - Previously identified glucose intolerance or pre-diabetes
 - History of gestational diabetes (diabetes caused by pregnancy) or giving birth to baby weighing over 9 lbs.
 - Hypertension
 - Polycystic ovarian syndrome
 - High cholesterol
 - History of cardiovascular disease (e.g. heart attack, blocked arteries, stroke)
 - Acanthosis nigricans (areas of darkened skin in creases along neck, under arms, behind elbows and knees, and in groin area)
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- Recurrent infections

Screening or testing is usually done in one or two visits to a doctor's office which may require fasting prior to the visit. Specific blood tests can usually determine if a person has impaired glucose tolerance or diabetes (see "Supplemental Information" at the end of this section for an in-depth description of these tests).

How is diabetes treated?

The complications due to diabetes can be delayed or prevented by keeping blood glucose levels in the normal range and not allowing glucose levels to become too high or low. This can be achieved with one or more of the following: insulin therapy, dietary modifications, exercise, or medications that reduce blood glucose levels. Monitoring blood glucose is often the first step in helping to determine diet and exercise goals and what medications may be needed. It is important to try to keep blood glucose levels within a normal range (90-130 mg/dL before meals and less than 180 mg/dL 2 hours after starting a meal) to prevent complications. Diabetic individuals may need to check their blood glucose levels one or more times a day with finger-stick devices. Blood glucose control may also be monitored by checking hemoglobin A_{1C} levels in the blood; this is usually done at a doctor's office. Hemoglobin A_{1C} levels help determine whether blood glucose levels are remaining stable over several months and should remain less than 7% in diabetic patients.

All people with diabetes should follow a healthy diet that is high in fiber. The Diabetes Food Pyramid, which is based on the USDA Food Guide Pyramid suggests an appropriate number of servings for each food group. Individuals who do not exercise frequently or need to lose weight should choose serving amounts at the lower end of the range, and those who are more active may have more servings. The recommended daily number of servings in each food group is as follows (for more information, see "Recommended Resources"):

- grains and starches (including starchy vegetables like potatoes, corn, beans, and peas): 6-11 servings
- vegetables (not including starchy vegetables): 3-5 servings
- fruit: 2-4 servings
- milk and dairy (non-fat/low-fat): 2-3 servings
- meat and meat substitutes: 4-6 ounces
- fats, sweets, and alcohol: 0-1 servings

Since 80% of people with type II diabetes are overweight or obese, a diet that restricts fat, sugar, and overall calories in combination with aerobic exercise is recommended since even modest weight loss of at least 10 pounds can significantly improve the body's ability to control blood glucose levels. An aerobic exercise of at least 30 minutes per day five days a week is optimal, although this goal should be reached gradually. Diabetic individuals should exercise after

meals if possible and should avoid exercise immediately after injecting insulin or if blood glucose levels are over 300. People with type II diabetes may be prescribed medications that can be taken orally and lower the level of glucose in the blood. All individuals with type I diabetes require insulin therapy, and individuals with type II diabetes may eventually require insulin as well if diet, exercise, and other medications do not control their blood glucose sufficiently. People who need to take insulin as part of their diabetes regimen are usually taught how to administer insulin themselves since it is injected into the body with a needle and may need to be taken several times a day. Some people may need to wear an insulin pump with a tube that can deliver insulin on a strict schedule. Insulin therapy performs the same function as the insulin that a normal body naturally produces, allowing cells to remove glucose from the blood.

Because complications of diabetes can develop at any time, even if people are receiving treatment, it is especially important to visit a health care professional for regular check-ups, including eye, nerve, cardiovascular, skin, and foot examinations and blood tests. If any diabetes-related problems are found, they should be treated right away because the problems will continue to worsen and will not improve on their own. People with diabetes should see a physician at least once every three to six months and more frequently if they are not able to keep their blood glucose levels under control.

How can diabetes be prevented?

Type I diabetes is not preventable with lifestyle modifications. However, anyone who has one or more risk factors for developing type II diabetes, especially individuals who have already been diagnosed with pre-diabetes, need to eat a diet high in fiber and low in sugary foods, exercise for 30 minutes 5 times a week, and reduce their weight by at least 10 pounds and preferably to a BMI of less than 24. This can dramatically reduce their risk of developing diabetes. Since obesity is a strong risk factor for type II diabetes, weight loss is particularly helpful in reducing the likelihood that a person will develop diabetes. Anyone can use the same healthy diet and exercise recommendations that people with diabetes use to maintain a healthy weight and reduce their risk of developing not only diabetes but other health problems like high blood pressure and cardiovascular disease.

Supplemental Information

This information is more in-depth and may be reviewed if you would like to know more about how diabetes is diagnosed but does not need to be included in farmworker health education discussions (unless you are really motivated).

How is diabetes screened for and diagnosed?

Diabetes is diagnosed by measuring the level of glucose (sugar) in the blood. A person with diabetes will have higher blood glucose levels resulting from the inability of cells to take glucose out of the bloodstream due to decreased insulin production (Type I diabetes) or decreased sensitivity to insulin (Type II diabetes). One or more of the following blood tests is often used to establish a diagnosis of diabetes:

- 1) *Fasting plasma glucose (FPG)*: This is the ideal test for screening individuals for diabetes or confirming a diagnosis. The person being tested needs to abstain from smoking, drinking, or eating for 8 or more hours before the test. An FPG below 100 is normal. If the FPG level is between 100-125, the person may have impaired fasting glucose (pre-diabetes) and should be re-tested in 6-12 months. If the FPG level is 126 or greater, the person may have diabetes and should be re-tested on another day as soon as possible, since two consecutive tests where the FPG level is at least 126 are required to confirm a diagnosis of diabetes.
- 2) *Random plasma glucose measurement*: This test is often used for convenience since it does not require fasting, but a person with an abnormal result (>200) must also have signs or symptoms of diabetes to be diagnosed with the condition. If the person does not have any symptoms but has an elevated test result, follow-up testing with a fasting plasma glucose test should be done to determine if he/she may have impaired glucose tolerance or diabetes.
- 3) *Two-hour glucose tolerance test*: The fasting requirements for this test are the same as for the fasting plasma glucose test. After a FPG level is measured, the individual is given a test dose of glucose. Any blood glucose measurement within 2 hours of the test dose that exceeds 200 confirms a diagnosis of diabetes. If the measurement after test dose administration is 140-199, the individual has impaired glucose tolerance (pre-diabetes) and should be re-tested in 6-12 months.

A person who is unable to complete a fasting test or whose results are unclear may also have a Hemoglobin A_{1C} test, which measures the amount of abnormal hemoglobin in the blood, although this test is more commonly used to monitor ongoing control of blood sugar in patients who have already been diagnosed with diabetes.

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Self-Assessment

(to be completed after reading Diabetes content)

1. What causes diabetes?
 2. What are some differences between type I and type II diabetes?
 3. What are some short-term and long-term medical problems that can be caused by diabetes?
 4. List some symptoms and signs that may indicate undiagnosed diabetes.
 5. When deciding whether someone should be screened or tested for diabetes, what risk factors should be considered?
 6. Why is it important for diabetic individuals to closely monitor their blood glucose levels?
 7. What are some treatment options for someone who has been diagnosed with diabetes?
 8. Describe some diet or exercise goals that would be appropriate for treating or preventing diabetes.
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DIABETES

Self-Assessment

(Answers)

1. What causes diabetes?
[the body becomes unable to produce enough insulin or becomes resistant to the effects of insulin, which keeps cells from utilizing glucose normally; glucose levels in the bloodstream then increase; processing of fats may also be abnormal]

2. What are some differences between type I and type II diabetes?

Type I Diabetes	Type II Diabetes
Body stops producing enough insulin Type I = 10% of diabetes cases Usually occurs in thin or normal-weight people Generally cannot be prevented by lifestyle modifications Always requires insulin therapy Cannot be treated with glucose-lowering (hypoglycemic) drugs	Cells become resistant to insulin Type II = 90% of diabetes cases Usually occurs in overweight or obese people Can reduce risk of development through diet, exercise, and weight loss May or may not require insulin therapy Can be treated with glucose-lowering (hypoglycemic) drugs

3. What are some short-term and long-term medical conditions that can be caused by diabetes?
[diabetic ketoacidosis, non-ketotic hyperglycemia, cardiovascular disease, diabetic neuropathy (nerve damage), eye damage and vision problems, digestive problems including gastroparesis, urinary problems, sexual dysfunction, kidney damage, foot problems, skin problems, gum disease and tooth decay, depression]
4. List some symptoms and signs that may indicate undiagnosed diabetes.
[frequent urination, increased thirst, unintended weight loss, frequent infections, vision changes, unexplained numbness or tingling, acanthosis nigricans (areas of darkened skin in creases around neck, under arms, behind elbows and knees, and in groin area)]
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5. When deciding whether someone should be screened or tested for diabetes, what risk factors should be considered?
[anyone with symptoms listed above or individuals above age 45, with two or more of the following risk factors, or with a high-risk ethnicity (African-American, Hispanic-American, Native American, Pacific-American, or Pacific Islander) who also has one or more of the following risk factors: overweight or obese, immediate family member with diabetes, sedentary lifestyle, glucose intolerance or pre-diabetes, history of gestational diabetes or baby over 9 lbs. at birth, hypertension, polycystic ovarian syndrome, high cholesterol, history of cardiovascular disease, acanthosis nigricans, recurrent infections]

 6. Why is it important for diabetic individuals to closely monitor their blood glucose levels?
[complications of diabetes can be delayed or prevented by keeping blood glucose in a normal range; monitoring blood glucose levels also helps determine diet, exercise, and medication needs]

 7. What are some treatment options for someone who has been diagnosed with diabetes?
[dietary modification, aerobic exercise, medications that reduce blood glucose levels, insulin therapy]

 8. Describe some diet or exercise goals that would be appropriate for treating or preventing diabetes.
[healthy diet that is high in fiber, is low in fats and sweets, and follows the Diabetic Food Pyramid; weight loss through decreasing sugars, fats, and calories if obese or overweight; aerobic exercise at least 30 minutes per day five days a week]
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Teaching Objectives

The facilitator and farmworker participants will discuss:

- 1. What is diabetes and what causes it?**
 - a. inability of body to produce or respond appropriately to insulin
 - b. causes high blood glucose as well as many other complications
 - c. type I vs. type II diabetes – may be caused by body attacking insulin-producing cells or cells becoming unresponsive to insulin

 - 2. What are the consequences of not treating diabetes?**
 - a. diabetic ketoacidosis/ non-ketotic hyperglycemia
 - b. cardiovascular disease
 - c. diabetic neuropathy (nerve damage)
 - d. other complications which may be due to or exacerbated by (b) or (c): eye damage/ vision problems, digestive problems including gastroparesis, urinary problems, sexual dysfunction, kidney damage, foot problems, skin problems, gum disease and tooth decay, depression

 - 3. Who should be tested or screened for diabetes?**
 - a. individuals with frequent urination, increased thirst, unintended weight loss, blurred vision, and/or fatigue
 - b. individuals over age 45
 - c. individuals with two or more of the listed risk factors
 - d. individuals of high-risk ethnicity with one or more of the listed risk factors

 - 4. How can diabetes be treated?**
 - a. monitoring and keeping blood glucose levels in normal range
 - b. insulin therapy
 - c. dietary modification
 - d. exercise
 - e. medications that lower blood glucose levels

 - 5. How can diabetes be prevented?**
 - a. weight loss/ maintaining healthy weight
 - b. healthy diet low in fat and sugar and high in fiber
 - c. aerobic activity at least 30 minutes per day five days a week
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Motivating/Learning Activity

The motivating / learning activity is an opportunity to support knowledge acquisition and comprehension among participants on a given health topic. These activities should be interactive and should begin to engage farmworkers in critical thought about the application of health information.

This is an opportunity to engage the group and to assess the comfort level and knowledge on the subject. You may find that the workers are very familiar with the topic and only require a review, or you may find that this topic is new or that there are misconceptions or mistaken ideas among the group. For this reason, it is a good idea to briefly note comments by the workers for further discussion.

A few suggested activities are:

- Cabbage game with questions related to diabetes, causes, consequences, prevention, treatment, control, etc.
 - Show pictures of diabetes-related complications (available on <http://www.diabetes.org>) and brainstorm ways to prevent these from occurring
 - Work through one or more online tutorials on diabetes (see Recommended Resources) with farmworkers and their families (requires computer with high-speed Internet connection); choose prevention or treatment topics as appropriate
 - Read through fotonovela “Un Cambio para Lucia” with farmworker families; compare and contrast their lives with Lucia’s
 - Use “Jeopardy” game to review specifics about diabetes (especially if the group seems familiar with the topic)
 - If farmworkers already have diabetes, review their management regimen with them to assess knowledge of medications and lifestyle modifications
 - Brainstorm ways to integrate exercise and healthy eating into daily lives; discuss benefits and ways to overcome challenges
 - Put sugar water or corn syrup (“high glucose blood”) in a clear plastic bottle and water (“normal glucose blood”) in another clear plastic bottle; color both with red food color. Show farmworkers how the liquids flow differently within the bottle and explain how this is similar to the way that blood with high glucose levels (syrupy blood) flows through smaller vessels. This can help individuals better understand the impact and potential damage of high blood glucose levels.
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Empowerment Activity

The goal of an empowerment activity is to develop skills, learn a new task, consider action to change one's situation, and / or begin exploring how to help oneself.

This is an important opportunity to identify what the farmworkers can do to reduce the likelihood of developing type II diabetes themselves.

- Are they aware of the risk factors for developing type II diabetes?
- Do they know which of the risk factors affect them personally and which risk factors can be modified?
- Do they have a plan to reduce their number of modifiable risk factors for diabetes?

Discuss the risk factors for developing type II diabetes (see list below). Help farmworkers and their families identify which of the factors affect them personally and which of the factors can be changed. Brainstorm ways to reduce or eliminate these risk factors and help individuals make a time-specific plan detailing the steps they are going to take to reduce their risk of developing type II diabetes.

Risk factors for type II diabetes:

- Age 45 or greater
- High-risk ethnicity (African-American, Hispanic-American, Native American, Pacific-American, or Pacific Islander)
- Overweight (BMI 25 or above)
- Parent, sibling, or child has diabetes
- Sedentary lifestyle (does not exercise)
- Previously identified glucose intolerance or pre-diabetes
- History of gestational diabetes (diabetes caused by pregnancy) or giving birth to baby weighing over 9 lbs.
- Hypertension
- Polycystic ovarian syndrome
- High cholesterol
- History of cardiovascular disease (e.g. heart attack, blocked arteries, stroke)
- Acanthosis nigricans (areas of darkened skin in creases along neck, under arms, behind elbows and knees, and in groin area)
- Recurrent infections

(Note: modifiable risk factors tend to be those related to diet or exercise.)

Reality check

- If you have not previously done diabetes-related health education activities with the farmworkers, they may be unfamiliar with some of the health terminology. Make sure to involve farmworkers in the discussion and invite them to ask questions whenever something is unclear.
 - Farmworkers may have multiple modifiable risk factors for type II diabetes, and making plans to reduce or eliminate all of the factors at one time may be impractical. It is okay to attempt to eliminate one risk factor at a time.
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Sample Class Plan

Subject: diabetes

Date:

Time:

Topic: What are the consequences of not treating diabetes?
(teaching objective 2 from diabetes module)

Key points, information, skills, or activities

As a result of this health education session, participants will:

1. Identify conditions that can result from not treating diabetes.
2. Increase their perceived susceptibility and the perceived severity of this disease, increasing the likelihood of behavior change.
3. Identify ways to monitor the development of complications.

Teaching methods

- Use of visual aids and drawing
- Discussion of handout materials
- Interactive tutorials
- Brainstorming
- Personal sharing
- Self-empowerment
- Cabbage game/Jeopardy game

Materials and preparation needed

- Large sheet of paper, markers or crayons, and stickers
- Diabetes Prevention Series handouts
- Computer with Internet access
- “cabbage” with questions (if using)
- “Jeopardy” question cards (if using)
- brochures from clinics or health department

Supporting media

Brochures or flyers appropriate for language and reading levels to distribute
NCFHP-approved content in case of questions

To begin, invite participants to reflect on their experiences with diabetes. What do participants already know? What would they like to learn?

1. Identify conditions that can result from not treating diabetes.

Diabetes-related illnesses or complications can occur if an individual has undiagnosed diabetes or if the disease is not kept under control. Diabetic ketoacidosis and non-ketotic hyperglycemia can develop rapidly (over the course of a few hours) and are medical emergencies. Chronic conditions that develop over a longer period of time may include cardiovascular disease, diabetic neuropathy (nerve damage), eye damage and vision problems, digestive problems including gastroparesis, urinary problems, sexual dysfunction, kidney damage, foot problems, skin problems, gum disease and tooth decay, and depression.

▼ Learning activities

- Draw a large outline of a person; if children are present, this could be done by tracing the outline of the child, or the drawing could be done beforehand. Have farmworkers place stickers on, draw, or circle the areas of the body that can be affected by diabetes-related complications. Discuss the symptoms related to these problems (e.g. foot problems can include sores, areas of numbness, or even gangrene leading to amputation).
- Use handouts from the Diabetes Prevention Series (see “Recommended Resources” section) to discuss complications that the farmworker identifies as of interest or concern.

2. Increase farmworkers’ perceived susceptibility and the perceived severity of this disease, increasing the likelihood of behavior change.

According to the Health Belief Model, increasing farmworkers’ awareness of their susceptibility to diabetes and the severity of the conditions that can result from not treating diabetes properly can increase the likelihood that they will be willing to make lifestyle changes to decrease their risk of developing diabetes.

▼ Learning activities

- Share statistics about the percentage of individuals in farmworker-specific groups (e.g. males or females, children, Hispanics/Latinos or African-Americans, age groups) that are affected by diabetes or diabetes-related complications to make farmworkers aware of the prevalence of these conditions.
 - If activities are done in a group setting, invite individuals who have diabetes to share any problems or struggles they have had with the disease and how they dealt with these problems. (It may be a good idea to identify these individuals beforehand and make sure that they are comfortable with sharing this information with the group.)
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- Work through online tutorials to help farmworkers become aware of the severity of complications.

3. Identify ways to monitor the development of complications.

Farmworkers may be unaware of their health care options, including screening or treatment options. Once they are aware of the potential complications of diabetes, they can watch for symptoms themselves or seek further medical care.

▼ *Learning activities*

- Invite a nurse or other health care professional to talk with and show farmworkers about what health care workers look for when screening for diabetic complications.
- Brainstorm ways that farmworkers with diabetes can help each other remember to watch for diabetes-related medical problems.
- Distribute brochures from local health departments or clinics that describe available services and discuss ways that farmworkers might be able to access these services.
- Work through online tutorials (e.g. Diabetes-Eye Complications, Diabetes-Foot Care) to help farmworkers become more aware of their own abilities to monitor health conditions.

Suggested review activities (choose one or two)

- play the cabbage game with a variety of questions to assess learning
 - play “Jeopardy” or other competitive game with prizes
 - ask if there were any points that were unclear
 - invite questions from the group
 - distribute written/pictorial information to reinforce the information learned
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Support for Learning Activities

These are a few suggested questions for the cabbage game. Feel free to write your own questions in addition to or instead of these. If the question is true/false, have the worker or another participant restate the sentence so that it will be true.

- Are blood sugar levels usually too high or too low in diabetes?
- Is diabetes contagious?
- What is the most common kind of diabetes?
- You should call 911 immediately if a diabetic person is having what kind of symptoms?
- What are some medical problems that can be caused by diabetes?
- Name some symptoms that people who don't know they have diabetes might have.
- At what age should people start regular screening for diabetes?
- Name some risk factors for developing type II diabetes.
- What are some ways that diabetes can be treated?
- How are obesity and diabetes related?

Possible “Jeopardy” questions (with suggested point values):

- 100: Are older people or younger people more at risk for type II diabetes?
- 100: True or false: overweight people are more likely to develop type II diabetes.
- 100: True or false: diabetes can cause vision problems.
- 200: Which is more common: type I or type II diabetes?
- 200: True or false: diabetes doesn't really lead to any other medical problems.
- 200: At what age should people start regular screening for diabetes?
- 300: Name three risk factors for developing type II diabetes.
- 300: Why is type II diabetes becoming more common?
- 300: Are people with high cholesterol more at risk for developing diabetes?
- 400: What is the BMI range for normal body weight?
- 400: To help prevent diabetes, how often should a person do aerobic exercise?
- 400: Which type of diabetes occurs more often in children?
- 500: What are the two most common chronic medical conditions that can be caused by diabetes?
- 500: How often should people with diabetes see a doctor?
- 500: How many daily servings of fats, sweets, and alcohol does the Diabetic Food Pyramid recommend?
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Recommended Resources for Outreach Workers

There are MANY resources available discussing diabetes prevention and treatment; the list below is by no means comprehensive. The “resources” section on the Migrant Clinicians Network Web site (<http://www.migrantclinician.org>) lists numerous publications, Web sites, and other resources for diabetes education. A Web search for information relevant to the population you are working with will also yield a large number of sites with useful tips or educational materials.

- Article **What is diabetes?**
Farmworker News Vol 9 Issue 4
2003
Available in English/Spanish
Outreach workers, farmworkers and their families

This article provides a brief overview of the risk factors, symptoms, and preventive measures associated with diabetes and would be useful as a follow-up handout to reinforce presented information.

Available online from: http://www.ncfh.org/00_ns_fn.php

- Article **Can children get diabetes too?**
Farmworker News Vol 9 Issue 4
2003
Available in English/Spanish
Outreach workers, farmworkers and their families

A dialogue between two mothers discusses symptoms that might be related to diabetes in children; this article might be relevant for farmworker families with children.

Available online from: http://www.ncfh.org/00_ns_fn.php

- Article **Diabetes and Oral Health**

Farmworker News Vol 9 Issue 4

2003

Available in English/Spanish

Outreach workers, farmworkers and their families

Information about dental problems caused by diabetes and how to maintain oral health.

Available online from: http://www.ncfh.org/00_ns_fn.php

- Flyers

1) Daily Foot Care

2) Diabetes: Dental Tips

3) Diabetes: Information for Healthy Living

4) Meal Planning for People with Diabetes

National Center for Farmworker Health

Available in English and Spanish

Farmworkers

Brief information sheets (1-2 pages) that provide information on lifestyle modifications and preventive measures for individuals who are already living with diabetes.

Information available from: <http://www.ncfh.org/search-results.php?fieldSearch=yes&category=DIABETES%20and%20NUTRITION>

- Fotonovela **Un Cambio para Lucia (A Change for Lucy)**

Migrant Clinicians Network

2005

Available in Spanish/English

Farmworkers and their families

Bilingual fotonovela for diabetes education and awareness that walks through the discovery of one woman that she has developed Type II Diabetes, and the emotions and life style changes that she goes through to adjust to the reality of having diabetes. Contact sarah@migrantclinician.org for more information. (description from MCN website)

Available from: http://www.migrantclinician.org/_resources/Fotonovela2005.pdf

NORTH CAROLINA FARMWORKER HEALTH MODULES

- **Clinical Practice Guidelines Adapting Your Practice: Treatment and Recommendations for Homeless Patients with Diabetes Mellitus**
HCH Clinicians' Network
June 2002
Available in English
Health care providers and outreach workers

Although these guidelines for providing appropriate health care to diabetic patients were written with the homeless population in mind, many of the suggestions are pertinent to migrant workers who may not have a permanent residence or the resources to adhere to a diabetes treatment regimen.

Available from: http://www.nhchc.org/Publications/clinical_guidelines_dm.pdf

- **Web Site North Carolina Diabetes Prevention and Control Branch**
NC Department of Health and Human Services
2006
Available in English/Spanish
Health care providers, outreach workers, and farmworkers

This Internet site provides a wealth of information on diabetes-related issues specific to the state of North Carolina. Some of the topics covered include information for people with diabetes, county- and state-specific epidemiological data, local diabetes prevention/treatment initiatives throughout the state, information for health care professionals, and a section in Spanish discussing information relevant specifically to the Hispanic and Latino population.

Available from: <http://www.ncdiabetes.org/>

- **Web Site American Diabetes Association**
2006
Available in English/Spanish
Health care providers, outreach workers, and farmworkers

This Internet site provides everything you ever wanted to know about diabetes. Pages within the "Community Programs and Local Events" section provide information specifically relevant to Latinos and African-Americans. Information about the Diabetes Food Pyramid and exercise recommendations are also available in the corresponding sections.

Available from: <http://www.diabetes.org>

NORTH CAROLINA FARMWORKER HEALTH MODULES

- Handouts **Diabetes Prevention Series**
National Diabetes Information Clearinghouse (NDIC)
National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) and
NIH
2006
Available in English/Spanish
Outreach workers, farmworkers and their families

These handouts address various complications that may result from diabetes and how to treat them or prevent them from occurring. Handouts contain charts and diagrams to help readers think more about their own healthy behaviors.

Available from: <http://diabetes.niddk.nih.gov/dm/pubs/complications/index.htm>

NDIC Web site: <http://diabetes.niddk.nih.gov/>

NIDDK Web site: <http://www.niddk.nih.gov/>

- Online Tutorials: **Diabetes-Carbohydrate Counting, Diabetes-Eye Complications, Diabetes-Foot Care, Diabetes-Introduction, Diabetes and Meal Planning, Healthy Eating, Diabetic Retinopathy, Diabetic Retinopathy and Photographic Screening, Hypoglycemia, Managing Cholesterol, Pancreatitis, Taking Insulin, Type I Diabetes, Type II Diabetes, Using Your Blood Glucose Meter**
Patient Education Institute
2006
Available in English and Spanish
Outreach workers, farmworkers and their families

Interactive online tutorials in slide show format with graphics and audio. Discuss diabetes-related topics: some are relevant specifically to individuals who already have the disease.

Tutorial available online: <http://www.x-plain.net> (search for topic “diabetes”)
