



# Diabetes

## Teaching plan

This lesson is designed to help workers learn about diabetes. To use this lesson for self-study, the learner should read the materials, do the case study activity, and take the test. For group study, the leader should give every learner a copy of the learning guide and use the suggested group activities to teach the lesson. *Approximate lesson time: One hour.*

### Learning objectives

Participants in this activity will be able to:

1. Explain what diabetes is and does.
2. Describe the four key elements of treatment for diabetes.
3. List the symptoms of low blood sugar and high blood sugar.
4. Know how to respond to a diabetic emergency.

### Teaching tip

When lecturing, move around the room a little to provide visual interest. Focus attention by writing main points on a board.

## Suggested group activities

### Introductory activity:

Give the learners a copy of the case study activity. Ask them to read the case studies and think about their responses. Explain that they will learn answers to these problems today.

### What diabetes is and does:

Go over the material in the learner guide about what diabetes is, the two types of diabetes, and the long-term effects of diabetes. You can do this as a mini-lecture. Point out that the pancreas is located behind the stomach, in front of the lower part of the backbone.

### The four key elements of treatment:

Review and discuss the material together, asking learners to read portions of the lesson aloud to the others. Emphasize the points that are of particular concern in your facility.

### Diabetic emergencies:

Ask the workers to study the symptoms of low blood sugar and high blood sugar for a minute. Quiz them by calling out a symptom and asking if it indicates high blood sugar or low blood sugar. Explain that some similar symptoms occur in both conditions, but low blood sugar happens suddenly. High blood sugar symptoms usually appear gradually and become worse.

Ask the learners to tell you how to respond to each type of diabetic emergency. Be sure they know that low blood sugar can cause heart attacks and strokes if not treated promptly.

### Conclusion:

Review the case studies again with the group, asking what should be done in these situations. See if their responses have changed since learning this material. Guide them to understand the correct procedures to follow in your agency, using the answer sheet to assist you.

Have the learners take the test, then grade the test together. Hand out certificates.



# Diabetes



## Learning guide

**D** *iabetes* is a disease that changes the way our bodies use food. It causes the level of sugar in the blood to be too high. The extra sugar harms the blood vessels and other organs in the body over time. Diabetes can cause great damage before any symptoms appear.

When we eat, our bodies digest the food and turn it into sugar, or **glucose**. In a normal healthy person, an organ called the **pancreas** produces **insulin**, a hormone. Insulin helps the body's cells use glucose to produce energy. The cells use this energy to keep our bodies healthy.

In someone with diabetes, either the pancreas is not producing enough insulin or the body does not use its insulin effectively. The cells cannot turn sugar into energy, and the sugar builds up in the blood. The cells are starved for energy, and the blood carries dangerously high levels of sugar that can't be used.

### There are two main types of diabetes:

**Type I** means that the pancreas is not producing insulin, or is producing very little. This type always requires shots of insulin injected into the body every day.

**Type II** means that the pancreas is producing insulin, but not enough, or that the body does not use its insulin effectively.

Nine out of ten cases of diabetes are Type II. It usually occurs in people over age 45 who are overweight. It can be treated by diet, exercise, and/or medications that are taken by mouth. Sometimes it also requires insulin injections.

### Why is it important to control diabetes?

The goal of treatment for diabetes is to keep the individual's blood sugar as close to normal as possible for that person. Doing this will lower the person's chances of getting:

- Stroke
- Heart disease
- Kidney failure
- Stomach disease
- High blood pressure
- Eye disease, loss of vision, or blindness
- Nerve damage, with pain or loss of feeling in hands, feet, legs, or other parts of the body

A high level of sugar in the blood over a long period of time can cause these problems.

### There are four parts to diabetic treatment:

1. Diet
2. Exercise
3. Medicine
4. Monitoring

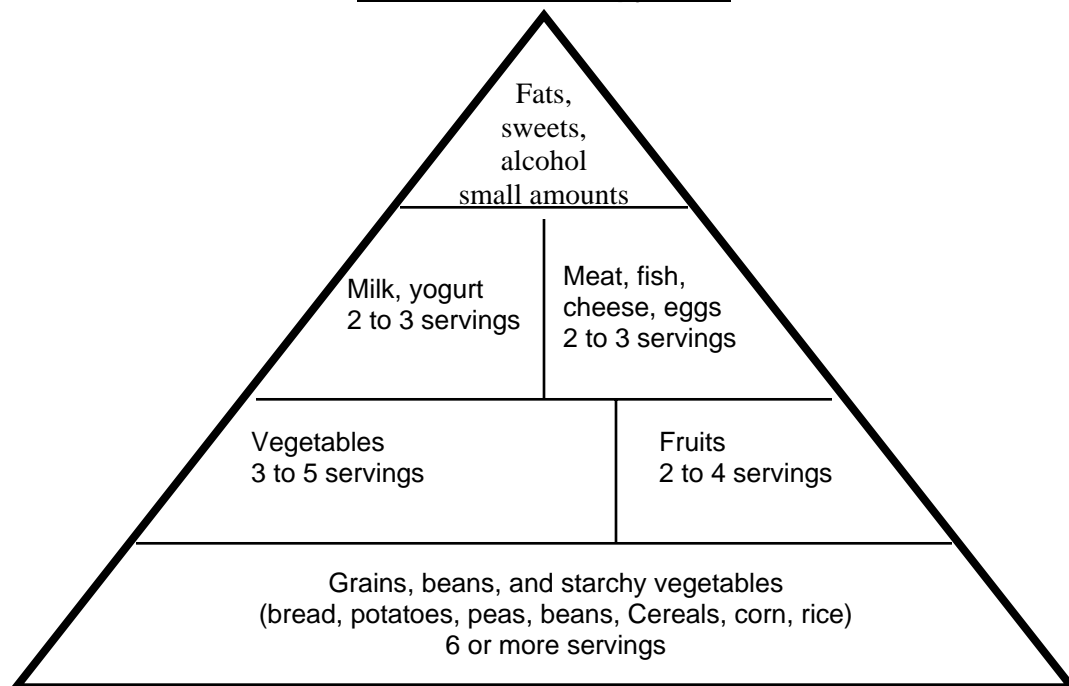
We will discuss each of these elements of treatment. Anyone who helps a diabetic person should be familiar with the medicine, exercise regimen, monitoring program, and diet that the individual is supposed to follow.

## 1. Diet

There is no one diabetic diet designed for every diabetic person, but there are guidelines to help diabetics with food choices. These guidelines are very similar to the kind of eating that is healthy for anyone. These are the main rules that should be followed:

1. Eat few sugary foods.
2. Eat less fat, especially saturated fat and cholesterol (butter, margarine, oils).
3. Eat a variety of fresh fruits, vegetables, lean meats, and fish.
4. Eat just enough calories to stay at a healthy weight.

### The diabetes food pyramid



Diabetics should eat the recommended number of servings from all the food groups on this pyramid every day, except for the fats, sweets, and alcohol. No one needs sweets or alcohol for good nutrition (they can be an occasional treat), and we get plenty of fats from the other food groups. The exact number of servings a diabetic should have from each group depends on individual calorie and nutrition needs, weight goals, exercise level, and preferences.

Many people think that diabetics are not allowed to eat sugar of any kind. This is no longer required. Sugar is a carbohydrate, like bread or potatoes, and can be part of the diabetic's food plan. However, most sugary foods provide calories without many vitamins or minerals, and they are often high in fat. It is better to eat more foods rich in nutrients, like vegetables and fruits, and very few fatty, sweet foods like ice cream and candy.

Dieticians sometimes teach diabetics and those who care for them to use Exchange Lists. These lists are a way to plan meals by putting foods in a category, such as a starch exchange or fruit exchange. Foods on a list can be substituted for each other and sometimes for foods on other exchange lists. The diabetic person eats only a certain number of each type of exchange every day, as ordered by a doctor or established by the dietitian.

## 2. Exercise

Exercise usually lowers blood sugar and may help insulin work better. It helps control weight, it improves blood flow, and it strengthens the heart. People with diabetes should exercise at least three times a week. Before a diabetic starts a new exercise program, a doctor should approve what kind, how often, and how long the diabetic exercises. Elderly and disabled people need to exercise also and should be helped to find an exercise they can do.

It is important that a diabetic not develop low blood sugar while exercising. Since the body burns sugar during exercise, the diabetic should “fuel up” with a piece of fruit or half a sandwich within an hour before starting any exercise. It is also a good idea for the diabetic to check his or her blood sugar level before he or she starts exercising. If the blood sugar reading is less than 70, he or she should eat something and wait for the blood sugar level to come up over 70 before exercising.

If a diabetic feels faint, sweaty, dizzy, or confused while doing any activity, he or she should stop and immediately drink fruit juice or a sweet (not diet) soft drink. He or she must respond quickly to this feeling, because it means his or her blood sugar level is too low.

## 3. Medication

Diabetics might receive insulin shots or they may take pills by mouth. Only a doctor can decide what medication and how much of it a diabetic should receive. It can be VERY dangerous to change a diabetic’s medication in any way unless it is ordered by a doctor. Diabetics must receive the exact amount of medicine their doctor has ordered, at the times the doctor has ordered. Timing of medicine and meals is important to prevent low blood sugar.

## 4. Monitoring

Close monitoring of a diabetic’s blood sugar level is one of the best ways for him or her to prevent long-term complications from the disease. Diabetics check their blood sugar by pricking a finger with a needle and testing a drop of blood with a special blood glucose meter. The meter, also called a monitor, gives a number that tells the level of glucose in the blood. These monitors must be kept clean and should be checked for accuracy periodically.

Most diabetics need their blood sugar level tested at least once a day, usually in the morning before breakfast. Depending on the type of diabetes, the age of the person, and other factors, the individual may need his or her blood glucose tested as much as five times a day. Sometimes insulin dosages are adjusted depending on the blood sugar level. This chart from the National Diabetes Education Program shows the recommended blood sugar levels at different times of the day:

Before Meals	80–130
At Bedtime	100–150

A doctor must set the acceptable ranges for each person, and they might differ from the normal ranges given in the chart. When a blood glucose level falls outside the range set by the doctor, the doctor must be notified as soon as possible. If you are assisting a diabetic with monitoring his or her blood sugar, be sure you know the correct range for him or her.

Another important part of monitoring is watching the feet and skin of a diabetic. Diabetes can turn a small sore or wound into a very large problem. Sores, blisters, and wounds on a patient’s feet and skin must always be reported to your supervisor or a nurse.

# DIABETIC EMERGENCIES AND HOW TO RESPOND

Diabetes can cause both long-term and short-term problems. Blood sugar that is too low or extremely high can lead rapidly to unconsciousness and even death. You must know the symptoms of both conditions and know how to respond.

**H**ypoglycemia means that the level of sugar in the blood is too low (less than 70). Too much insulin or oral medication, too much exercise, not eating enough food, or drinking alcohol can cause it. Hypoglycemia can cause strokes and heart attacks in the elderly. This problem is also called **insulin reaction** or **insulin shock**.

Symptoms of low blood sugar: These symptoms occur suddenly and without warning:

- Shaky, nervous
- Sweaty and cold
- Pale, clammy skin
- Weak and tired, drowsy
- Sudden hunger
- Blurred or double vision
- Tingling of hands, lips or tongue
- Confusion
- Personality change
- Slurred speech
- Loss of consciousness
- Dizziness, or a staggering walk
- Nausea
- Headache
- Fast heartbeat
- Itching

Note: Elderly people and people with other diseases and disabilities can be especially sensitive to low blood sugar, and it can be very dangerous for them. Some people may have a reaction even when their blood sugar is not below 70. Any diabetic suddenly showing any of the signs listed above must receive immediate attention.

Treatment:

- The person should drink a sweet drink such as sweetened coffee or tea, orange juice, or soda.
- Or, the diabetic could eat sugar, corn syrup, or candy, or take glucose tablets.

**H**yperglycemia means that the level of sugar in the blood is too high (above 180). It can be caused by infections, illness, stress, injury, not enough insulin, not enough exercise, or eating too much food. Very high levels of sugar can cause coma and death.

Symptoms of high blood sugar: These symptoms occur gradually and get worse over time:

- Extreme thirst and/or hunger
- Rapid weight loss
- Frequent urination
- Vision changes
- Dry skin and mouth
- Fatigue, drowsiness
- Nausea
- Fruity-smelling breath
- Very deep, gasping breathing
- Unconsciousness

Treatment:

The first seven symptoms in this list should be reported to your supervisor or a nurse as soon as possible. Fruity-smelling breath, deep gasping breathing, and unconsciousness are emergency symptoms that can lead quickly to death. Call 911 or access emergency medical care at once.

## Case study activity

The following case studies are examples of things that sometimes happen in personal care homes. Read each case study and discuss possible ways of handling the situation. If you are doing this lesson by yourself, think about what you should do and how you would respond to these situations. You can write your ideas below.

### Case study #1

Mrs. Jarvis is diabetic. One day as you are assisting her with her shower, you notice that she seems confused. She doesn't seem to understand what you say to her, and she acts nervous. Her skin feels cool and damp and looks paler than usual.

What do you think might be happening to Mrs. Jarvis? What, if anything, should you do?

### Case study #2

One morning Mr. Young's blood sugar reading is 250. He seems fine and says he feels great. Mr. Young's doctor said his blood sugar should not go above 220.

What should you do in this situation?

### Case study #3

Mrs. Bond checks her blood sugar and gives herself insulin every morning. You are supposed to remind her to do this. When you remind her, she always tells you that she has done it or is about to do it. Lately you've noticed that Mrs. Bond seems to be losing weight. You watch to be sure she is eating, and you see that she is eating a large amount of food. She has started urinating on herself sometimes, and when you help her get cleaned up she says that she is urinating a lot and sometimes she just can't make it to the bathroom. When you suggest that she should cut back on the water she is drinking, she tells you that she is thirsty all the time.

What is going on with Mrs. Bond? What action, if any, should you take?

## Case study activity answers

Here are the suggested answers for the case study activity. You might need to add additional information because of specific protocols and procedures in your facility.

### Case study #1

Mrs. Jarvis is diabetic. One day as you are assisting her with her shower, you notice that she seems confused. She doesn't seem to understand what you say to her, and she acts nervous. Her skin feels cool and damp and looks paler than usual.

What do you think might be happening to Mrs. Jarvis? What, if anything, should you do?

#### Answer:

Mrs. Jarvis is probably suffering from low blood sugar. She should be given a drink of fruit juice or other sweetened drink (tea or coffee with sugar, non-diet soda), or assisted to take some sugar cubes or glucose tablets. If possible, her blood sugar should be checked.

If Mrs. Jarvis does not get better or gets worse, or if her blood sugar is outside her approved range and does not improve when rechecked, medical assistance should be summoned.

### Case study #2

One morning Mr. Young's blood sugar reading is 250. He seems fine and says he feels great. Mr. Young's doctor said his blood sugar should not go above 220.

What should you do in this situation?

#### Answer:

Mr. Young's blood sugar is too high and must be reported to his physician. Even though he has no symptoms, this condition could worsen without treatment. In addition, a blood sugar this high is causing hidden long-term problems in his body. Follow your facility's protocol for notifying your supervisor, a nurse, or the doctor.

### Case study #3

Mrs. Bond checks her blood sugar and gives herself insulin every morning. You are supposed to remind her to do this. When you remind her, she always tells you that she has done it or is about to do it. Lately you've noticed that Mrs. Bond seems to be losing weight. You watch to be sure she is eating, and you see that she is eating a large amount of food. She has started urinating on herself sometimes, and when you help her get cleaned up she says that she is urinating a lot and sometimes she just can't make it to the bathroom. When you suggest that she should cut back on the water she is drinking, she tells you that she is thirsty all the time.

What is going on with Mrs. Bond? What action, if any, should you take?

#### Answer:

Mrs. Bond might have an inaccurate glucose monitor machine, she might not be taking her insulin correctly, or she might be forgetting to take it in spite of your reminders. Her symptoms indicate that her blood sugar is too high. Her blood sugar should be checked. Even if her blood sugar is normal, these symptoms must be reported to her doctor.

# Diabetes

## Test

Name: \_\_\_\_\_ Score: \_\_\_\_\_ (12 points required)

1. Fill in the chart of normal recommended blood sugar levels with the missing numbers: (Worth two points)

Before Meals	
At Bedtime	

2. Write the four parts of diabetic treatment: (Worth four points)

a. \_\_\_\_\_ b. \_\_\_\_\_ c. \_\_\_\_\_ d. \_\_\_\_\_

3. If a diabetic person becomes weak, tired, and dizzy, you should first: (circle one)
- Have her lie down until it wears off.
  - Give her something sweet to drink.
  - Call 911.
4. Diabetics should never eat candy, ice cream, or cake. True or False (circle one)
5. You should call 911 if a diabetic has the following symptoms: (circle one)
- Confusion and personality change
  - Weakness and dizziness
  - Fruity-smelling breath or deep, gasping breathing
  - Itchy skin
6. Having high levels of sugar in the blood over a long period of time can cause heart disease, blindness, and loss of feeling in the feet. True or False (circle one)
7. For most people, blood sugar is too low if it reads less than \_\_\_\_\_ on a glucose meter.
8. For most people, blood sugar is too high if it reads more than \_\_\_\_\_ on a glucose meter.
9. All diabetics must take insulin shots. True or False (circle one)
10. All diabetics should monitor their blood sugar, control their diet, exercise, and take their medicines. True or False (circle one)
11. If you notice sores or wounds on the \_\_\_\_\_ or \_\_\_\_\_ of a diabetic, you must report them to your supervisor or a medical person. (Worth two points)
12. Low blood sugar can cause heart attacks and strokes in the elderly. True or False (circle one)