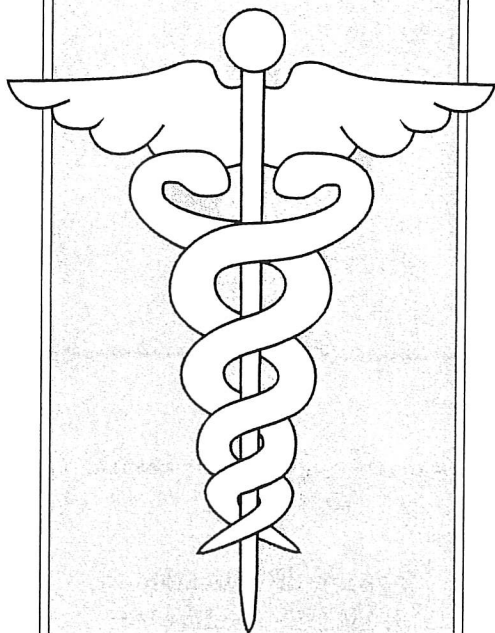


Long Term Care
Network,
A Division of
PRIMEDIA Healthcare

Diabetes: When Blood Sugar Is Out of Control

EDA 311-0193



LTCN™
Long Term Care Network

presenter
Gina Duncan, MSN, RN, CCRN, ACNP, CS
Specialist
University of Texas at Arlington
Arlington, Texas

© MM, PRIMEDIA Healthcare
PLEASE NOTE: Permission granted for duplication by
Long Term Care Network subscribers only.

INTRODUCTION

Diabetes mellitus is a common condition, affecting nearly 16 million Americans. It is a group of disorders or diseases which affect the body's ability to use glucose (blood sugar). This program discusses the role of glucose in the body, explains the classifications of diabetes, and suggests some appropriate interventions when high or low blood sugar is suspected.

TARGET AUDIENCE

The target audience for this activity is certified nursing assistants.

LEARNING OBJECTIVES

After completing this activity, the participant should be able to:

1. define *diabetes mellitus*.
2. explain how glucose works in the body.
3. classify the two types of abnormal blood sugar.
4. identify interventions appropriate when hypoglycemia or hyperglycemia is suspected.

11/00



This syllabus is designed to be used in conjunction with video program EDA 311-0193 by the Long Term Care Network, a division of PRIMEDIA Healthcare. PRIMEDIA Healthcare is a division of PRIMEDIA Workplace Learning.

For questions or general information,
please contact:

Director of Education
PRIMEDIA Healthcare
4101 International Parkway
Carrollton, TX 75007
(800) 624-2272, ext. 5312

*Upon our receipt of the completed
Answer Sheet/Evaluation Form, partici-
pants will receive a Certificate of CE
Credit within four weeks.*

DIABETES: WHEN BLOOD SUGAR IS OUT OF CONTROL

DIABETES DEFINED

Diabetes mellitus is a common condition, affecting nearly 16 million Americans. Each year, more and more Americans are diagnosed with this chronic, life-altering condition. So what is diabetes? It is a group of disorders or diseases which affect the body's ability to use glucose (blood sugar). Diabetes mellitus is a lifelong condition that requires thorough knowledge of the disease, its complications, and treatment.

CAUSE OF DIABETES

The cause of diabetes is related to the dysfunction of the pancreas, one of the organs in the body that helps with digestion. The normal functioning pancreas produces a hormone called *insulin*.

When we eat, most of the foods we eat contain sugar. Since sugar in food is too large to enter the smallest units of our body, called *cells*, the body must break it into smaller parts. Sugar is broken down into units of glucose. Once sugar is split into glucose, insulin carries it into our cells. Once inside the cell, it acts like gasoline would in a car. It allows the body to work.

Glucose is the energy or fuel our bodies must have in order for us to talk, move our body, digest food, move blood through our heart and blood vessels, sleep, think, and even breathe. Therefore, we cannot survive without insulin; insulin is the only way in which glucose can provide fuel to our body.

TYPES OF DIABETES

There are two types of diabetes mellitus, type 1 and type 2.

TYPE 1

Type 1 results when the insulin-producing cells in the pancreas, called *beta cells*, are mistakenly destroyed by our body. For some unknown reason, our body begins to attack these beta cells. The consequence is insulin production is stopped. Once insulin production is stopped, glucose cannot get into the cell to provide fuel for the body, and the body becomes ill very rapidly.

TYPE 2

In type 2 diabetes mellitus, the beta cells in the pancreas have not been attacked and destroyed; however, our body is less efficient than normal. This decreased efficiency can occur in the beta cells, resulting in decreased insulin production. A deficiency can also occur in the other cells of the body, as they become less responsive to the insulin, even if there are normal amounts available. When the cell becomes less sensitive to the insulin, some glucose gets into the cell, but not enough.

In contrast to type 1, type 2 diabetes does not happen rapidly because some glucose is getting into the cells. Instead, diabetes type 2 can take years to develop and may be diagnosed even though no symptoms are present.

HIGH-RISK POPULATIONS

Who is at risk for diabetes type 1 and type 2? Some well-known risk factors include:

- ❖ age greater than 45.

- ❖ decreased physical activity.
- ❖ family history of diabetes.
- ❖ being overweight.

Members of ethnic groups, such as African-Americans, Hispanics, and Native Americans have been recognized as having an increased risk of diabetes.

TYPES OF ABNORMAL BLOOD SUGAR

The two types of abnormal blood sugar are hyperglycemia and hypoglycemia.

Despite the type of diabetes, the major problem is that cells are unable to use glucose, leaving glucose outside the cell and in the bloodstream. Glucose in the bloodstream is normally found in small amounts and can be measured by drawing blood from a vein or sticking the finger for a blood sample. If you work in a hospital or long term care facility, you will often see patients with diabetes have a “finger stick” done before meals to check their blood sugar.

The sample is then analyzed and a number indicating how much glucose is in the blood is available. When blood sugar is increased, the sample indicates a number higher than normal. An elevation in glucose is called *hyperglycemia* (hyper = high; glycemia = glucose).

HYPERGLYCEMIA (HIGH GLUCOSE LEVEL)

A normal glucose level right before eating is usually 80-125 mg/dl. A glucose level greater than 126 is considered elevated. Blood sugars, when elevated, can range from 126 to over 1,000. The higher the glucose level, the more dangerous the situation for the patient. A glucose level of 150 is not as dangerous as a glucose level of 400.

Why is a high glucose level dangerous? When blood sugar (glucose) is elevated, the body tends to accumulate this glucose inside its arteries and around the nerves. This accumulation of glucose can occur in the arteries and nerves that lead to the brain, kidneys, legs, and eyes.

When glucose is present in high amounts in the arteries, the inside of the artery thickens. Over time, thickened arteries become hardened, causing blood flow to be disrupted to the heart muscle, eye, kidney, brain and legs. This can lead to devastating problems such as blindness, kidney failure, heart attack, stroke, and loss of toes, feet or legs.

When glucose accumulates around nerves in the body, the function of the nerve is impaired, leading to such problems as decreased sensation in the feet and legs, impaired walking, and the inability to feel pressure or pain. The inability to feel pressure or pain is dangerous because an individual with diabetes may not be aware of sores or cuts on his or her feet or other areas of the body. This person may also not be aware of chest pain, which could indicate a heart attack.

Symptoms of hyperglycemia. When caring for a patient with diabetes, how will you know if their blood sugar is elevated? Patients may or may not know when their blood sugar is elevated. Some symptoms of increased blood sugar include:

- ❖ thirst.
- ❖ dry mouth.
- ❖ increased urination.
- ❖ increased hunger.
- ❖ blurred vision.

Reasons for Hyperglycemia. What are some of the reasons for increased blood sugar? There are a variety of reasons blood sugar is elevated. Sometimes, it is because the patient is sick. When the body is sick, it is under “stress” to return to a normal state of health. This stress response increases the glucose because the body needs more energy or fuel to repair itself.

Another reason for elevated blood sugar is when a patient does not take his or her medications for diabetes. Patients with type 1 diabetes require insulin because the beta cells of the pancreas make no insulin. Insulin is given by an injection with a small syringe and needle.

Patients with type 2 diabetes may control their condition by diet or by oral medications (pills). Sometimes, if the pills are not effective, a patient with type 2 diabetes may need insulin alone or in combination with oral medications.

Patients who do not follow their diabetes diet may also have increased blood sugar. A diabetes diet balances carbohydrates, protein, fat and calories. It used to be thought that high sugar foods such as cakes, pies, cookies, table sugar and ice cream would increase blood sugar very rapidly. We now know all foods containing sugar (vegetables, fruits, bread, pasta, beans, and sweets) can increase blood sugar equally when eaten in large amounts. The key to diet is moderation and avoiding major changes in food intake.

Blood sugar can also be elevated if the medications are not working effectively. Gradually, the blood sugar rises to higher and higher levels. Once the medications are adjusted, the blood sugar levels begin to decrease to more acceptable levels.

HYPOLYCEMIA (LOW GLUCOSE LEVEL)

Besides hyperglycemia or increased blood sugar, sometimes patients with diabetes experience very low blood sugar, or *hypoglycemia* (hypo = low; glycemia = glucose). When the blood sugar drops too low, this can occur very quickly, causing the patient to feel ill. Most patients have symptoms of hypoglycemia. The symptoms range from nervousness to seizure. This is a dangerous condition, and without treatment, the patient can die.

If you are taking care of a patient with diabetes, be on the lookout for the following signs and symptoms of hypoglycemia, and report them immediately to the nurse caring for the patient:

- ❖ nervousness or irritability.
- ❖ change in mental status or decreased alertness.
- ❖ increased sweating.
- ❖ shaking or convulsions.
- ❖ combativeness or aggressive behavior.
- ❖ weakness.
- ❖ confusion.

Hypoglycemia can occur if the patient was given more insulin than the body required. Also, if a patient is given medication for diabetes before a meal, and that person did not eat enough food during that meal, hypoglycemia can result.

If you suspect a patient is having hyperglycemia or hypoglycemia, you must immediately report this to the nurse caring for the patient. If the patient becomes aggressive or combative or is weak or confused, stay with the patient to prevent injury and send for help immediately.

As a nursing assistant, you have an important role in preventing complications for patients with diabetes. Communication with the healthcare team including nurses, nurse practitioners, and physicians is important in ensuring good management of diabetes. By being aware of the signs and symptoms of blood sugar when it is out of control and by following the tips in Table 1, you will have a major impact on the health and wellness of your patients.

TABLE 1

TIPS FOR NURSING ASSISTANTS

1. Report signs and symptoms of hypoglycemia or hyperglycemia to the nurse immediately.
2. Encourage consistency in diet from day to day to prevent swings in blood sugar.
3. If feeding a resident with diabetes, encourage adequate intake to prevent hypoglycemia.

REFERENCES

American Diabetes Association: www.diabetes.org

Craven, R., & Hirnle, C. (2000). *Fundamentals of nursing: Human health and function* (3rd ed). Philadelphia: Lippincott.

POST TEST

DIABETES: WHEN BLOOD SUGAR IS OUT OF CONTROL

1. Diabetes is a condition that results in decreased blood sugar which may lead to complications in the heart, brain, kidney and eyes.
 - a. True
 - b. False
2. Diabetes type 1 results **in** which?
 - a. Increased insulin secretion
 - b. Decreased insulin secretion
 - c. No change in insulin secretion
 - d. No insulin secretion
3. Diabetes type 2 results **from** which?
 - a. No insulin secretion
 - b. Increased cell sensitivity to insulin
 - c. Decreased cell sensitivity to insulin
 - d. Decreased blood sugar levels
4. All are reasons for hyperglycemia, EXCEPT:
 - a. increased caloric intake.
 - b. decreased effectiveness of medications.
 - c. missed dose of insulin.
 - d. nausea and vomiting.
5. Which is a sign of hyperglycemia?
 - a. Jitteriness
 - b. Increased appetite
 - c. Decreased urine production
 - d. Sweating
6. Obesity is a risk factor for which type of diabetes?
 - a. Type 1
 - b. Type 2
7. Mrs. Smith, a 75-year-old female, is a patient on your unit. She has had diabetes for ten years and only takes diabetes pills at home. When she is in the hospital, she asks you why she needs the insulin shot. What is your best response?
 - a. "You will need this shot from now on because your diabetes is getting worse."
 - b. "You will probably only need this while in the hospital. When you are sick, your glucose goes up."
 - c. "You are getting the shot to decrease your insulin production."
 - d. "You are getting the shot to stimulate your pancreas to make more insulin. If it works, you won't need anymore insulin."
8. The purpose of a fingerstick is to:
 - a. measure the amount of insulin in the body.
 - b. decide how many calories the patient will need.
 - c. monitor the effect of medications and diet on glucose level.
 - d. decide if diabetes medications (pills) need to be given.
9. Which complication indicates nerve damage?
 - a. Retinopathy
 - b. Neuropathy
 - c. Coronary artery disease
 - d. Nephropathy
10. What is a potential result of chronic uncontrolled hyperglycemia?
 - a. Blindness
 - b. Amputation
 - c. Kidney failure
 - d. Heart disease
 - e. All of the above