

# What is Diabetes?

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2 credit hour course

Diabetes is a group of diseases caused by defects in the body's ability to produce insulin, which in turn results in abnormal blood glucose levels. Diabetes can lead to serious conditions in a person's body, even resulting in early death. There are several ways a person can control the disease, lowering the risk of serious health issues occurring.

So what exactly is insulin, and why is it so important? The pancreas produces what are called beta cells inside our bodies. These beta cells then produce a hormone called insulin, a hormone that regulates the levels of glucose in the blood. Glucose is another name for sugar, the main source of energy used by the cells of the human body. Insulin allows glucose to enter the cells, where they can be stored for later use or burned for energy. When the body has trouble making insulin or cells in the body don't respond to the insulin how they should, diabetes is the result.

## **Type 1 Diabetes**

Type 1 diabetes develops when the immune system in someone begins destroying pancreatic beta cells, thus shutting down insulin production. In order to survive, a person with type 1 diabetes must have insulin delivered by injection or by a pump. Children and young adults are the ones usually struck by type 1, though it can occur at any age. In adults, type 1 diabetes accounts for 5-10% of all diagnosed cases.

## **Type 2 Diabetes**

Type 2 diabetes, in adults, accounts for about 90-95% of all diagnosed cases. It will normally begin as insulin resistance, where cells do not use insulin properly. As the need for insulin increases, the pancreas eventually loses the ability to produce it.

## **WHAT CAUSES DIABETES?**

The exact origin of most cases of diabetes is uncertain. The list below gives a brief overview of some of the causes of diabetes:

**Hereditary/Inherited Traits**-Many researchers believe that due to some genes being passed from one generation to the next, an individual can inherit diabetes. Blood relationship plays a large part, if the mother has diabetes, the chances the child will also increase, same if the father has diabetes. If both parents have it, the risk is even greater that the child will have it.

**Age**-Despite the fact that diabetes may occur at any age, 80% of cases occur in people 50 years and older. Incidents increase with age being a factor.

**Malnutrition**-Poor nutrition, low protein and fiber intake, eating more refined foods are thought to contribute to the development of diabetes.

**Obesity**-Someone who is overweight will have increased insulin resistance. If a person's body fat is more than 30%, Body Mass Index (BMI) of 25+, waist of 35 inches or more in women or 40 inches in men.

**Sedentary Lifestyle**-People who are not physically active are more prone to diabetes than a person who exercises at least 3 times per week.

**Stress**- Emotional or physical stress is frequently blamed for the initial onset of the disease.

**Drugs**-There are several drugs, including Clozapine, olanzapine, risperidone, quetiapine and ziprasidone that have been known to induce this disease in people.

**Infection**-There are some strains of streptococci that may be a factor for infection of the pancreas.

**Sex**-Diabetes is shown to be more prevalent in the elderly, especially males. It is also shown to be strong in women who have had multiple pregnancies or suffering from Polycystic Ovarian Syndrome.

**Hypertension**-There have been many studies that show a correlation between high systolic pressure and diabetes.

**Serum lipids and lipoproteins**-High cholesterol and high triglyceride levels in the blood are directly related to higher blood sugar levels. It has even been shown in a few cases that people with low HDL levels are at risk for developing diabetes.

### WHO GETS DIABETES?

Type 2 diabetes is the type that affects most adults; it is not discriminatory when it comes to who will develop the disease. There are several factors that can contribute to a higher risk for developing the disease:

- Being overweight with a body mass index of 25+
- Physical inactivity
- Fat around the waist and stomach
- High blood pressure (140/90 mm/Hg or higher)
- Being 50 years or older
- Having family history of type 2 diabetes
- Being of African-American, Latino, Asian-American, or Native American descent
- Having had gestational diabetes or having a baby who weighed 9lbs or more.
- High triglyceride levels (250 or more)
- Low HDL cholesterol (less than 35)

Type 2 diabetes at one time was exceptionally rare before middle age. Today, it affects more and more children who are overweight and physically inactive. Being overweight and sedentary, even as a child, is a large risk factor in developing diabetes later in life.

### SYMPTOMS OF DIABETES

Diabetes has a tendency to start slowly in adults. There are perhaps millions of people throughout the world that have diabetes; they just don't know it yet. People may feel tired at first, and then later may also develop the following symptoms:

- Increased frequency in urination, the body trying to get rid of excess sugar in the blood
- Increased thirst as the body needs to replace lost fluid
- Frequent infections
- Weight loss even with increased caloric intake
- Blurred vision
- Nausea
- Sores on the skin that don't seem to heal

The important thing to remember is that the symptoms signaling the onset of diabetes may not be the same for everyone. The symptoms of someone with type 2 diabetes may come on gradually, with some people not having any symptoms at all, not knowing they have the disease.

Untreated diabetes can cause some serious health problems in an individual such as blindness, heart and blood vessel damage as well as permanent nerve damage. It is very important to see your doctor on a regular basis to determine your risk for diabetes and maintaining a healthy lifestyle.

### DIAGNOSIS

The most common way to test for diabetes is by measuring the body's fasting glucose levels. If that value is lower than the value that is necessary to diagnose diabetes but the physician suspects that the patient may still have diabetes, is when an oral glucose tolerance test may be performed. This test will show how well the body uses glucose.

A person should talk with their physician about how often they should be tested for diabetes. How frequently someone is tested is dependent on their age and risk factors for contracting the disease. If a person is 50 years or older they should get tested, even if they do not have any risk factors. If an individual is younger than 50 and has one or more risk factors, then they too should be tested. Once a person is past the age of 50, they should be tested for diabetes every three years.

### YOUR ROLE AS A CAREGIVER

It is very important to become familiar with the signs of insulin shock (hypoglycemia) and diabetic coma. The following are symptoms of insulin shock:

- Complaints of hunger, weakness, dizziness, shakiness
- Skin is cold, moist, clammy, pale
- Rapid, shallow respirations
- Nervousness and excitement
- Rapid pulse
- Unconsciousness
- No sugar in the urine
- Low blood sugar test results

If the patient is awake and alert, treatment can include intake of orange juice, milk, or another easy to absorb carbohydrate such as hard candy. If the patient is unconscious, the doctor or the nurse may administer glucagon, causing a rapid rise in blood sugar.

Another thing to be aware of are the signs of diabetic coma:

- Early headache, drowsiness, confusion
- Sweet, fruity odor to the breath
- Deep breathing, labored respirations
- Full, bounding pulse
- Low blood pressure
- Nausea or vomiting
- Flushed, dry, hot skin
- Weakness
- Unconsciousness
- Sugar in the urine
- High blood sugar test results

The course of treatment for someone in a diabetic coma is insulin, fluids and electrolytes.

If you are alerted to the signs of insulin shock or a diabetic coma, report them **immediately** to the nurse. Also become acquainted with where things such as orange juice or easily absorbed carbohydrates are stored. If caring for a patient at home, keep these things readily available, as well as serving the patient

proper meals. Make sure to not give extra nourishment to the patient without permission from the doctor or nurse. Carefully document what the patient eats, report any uneaten food to the nurse.

It is also very important to pay attention to the patient's personal hygiene, oral care and keeping clean. Diabetics must bathe on a regular basis to prevent the appearance of skin infections. However, they should not spend long periods of time soaking in the bathtub, possibly leading to a skin breakdown from softening tissue. If you observe areas on the skin such as yellowish pimples, boils, or red areas in the skin folds (under the breasts, armpits, groin), let the nurse know. Help the patient with their brushing and flossing if they need it. Foot care is also imperative, drying well between the toes is especially important. Listed below are things to remember when it comes to foot care:

- Patient's feet should be washed daily, drying well between the toes.
- Look over feet closely for any skin breaks or irritation.
- Report anything odd to the nurse.
- Do not let moisture collect between the toes.
- The toenails of a diabetic should only be cut by a podiatrist or a nurse, someone licensed to provide foot care.
- Shoes and socks/stockings should fit well, clean, no holes.
- Patient should not go barefoot.

Remember, if you see any kind of abnormality on the skin of the patient report it to the nurse or doctor immediately. Untreated skin breaks on the feet can lead to Gangrene, and then amputation.

When it comes to testing blood sugar levels in the patient, please consult the plan of care and the nurse for specific instructions. Normal blood sugar values will differ with each company, facility, or plan of care. Learn the normal values for the patient. Values that are well above or below the normal range may signal serious diabetic issues. Inform the nurse immediately of the blood sugar results. Other signs and symptoms of blood sugar problems may include:

- Eating food not on the diet
- Not enough food
- Not enough fluids
- Refusal to eat
- Vomiting, nausea, diarrhea
- Complaints of racing heart, dizziness, shakiness
- Excessive activity

As always, if you detect any abnormalities or symptoms with the patient, inform the nurse immediately.

# Test Questions

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1. Diabetes is a group of diseases caused by defects in the body's ability to produce \_\_\_\_\_.
  - A. Antibodies
  - B. White blood cells
  - C. Insulin
  - D. Adrenaline
2. Insulin is produced by \_\_\_\_\_, which are themselves produced in the \_\_\_\_\_.
  - A. Red blood cells, Liver
  - B. White blood cells, spleen
  - C. Beta cells, pancreas
  - D. Hemoglobin, kidneys
3. Insulin allows \_\_\_\_\_ to enter the cells of the human body.
  - A. Glucose
  - B. Protein
  - C. Carbohydrates
  - D. Lipids
4. A person with Type 1 diabetes has slight insulin resistance that can be controlled by a proper diet and exercise. T F
5. Type 2 diabetes accounts for nearly 50% of all diagnosed cases. T F
6. The following are all examples of causes of diabetes except:
  - A. Malnutrition
  - B. Age
  - C. Race
  - D. Stress
7. 80% of diabetes cases occur in people 35 years and older. T F

8. Factors contributing to type 2 diabetes include the following except:

- A. Obesity
- B. 30+ years old
- C. physical inactivity
- D. high blood pressure

9. Type 1 diabetes accounts for 5-10% of all diagnosed cases. T F

10. Possible symptoms of diabetes include the following except:

- A. Paranoia
- B. Increased thirst
- C. Blurred vision
- D. Nausea

11. Untreated diabetes can cause all these issues except:

- A. Permanent nerve damage
- B. Blood vessel damage
- C. Cancer
- D. Blindness

12. Once past 50 years of age, a person should be tested for diabetes every \_\_\_\_ years.

- A. 1
- B. 2
- C. 3
- D. 4

13. Hypoglycemia is also known as \_\_\_\_\_ .

- A. Sugar coma
- B. Glucose deficiency
- C. Insulin shock
- D. Sugar shock

14. Four symptoms of insulin shock include the following except:

- A. Body is overheated
- B. Rapid pulse

- C. Hunger**
  - D. Weakness**
15. Orange juice, milk, or other easy to absorb \_\_\_\_\_ like hard candy are important to have on hand.
- A. Proteins**
  - B. Carbohydrates**
  - C. Vitamins**
  - D. Lipids**
16. Four signs of diabetic coma include the following except:
- A. Low blood pressure**
  - B. Full, bounding pulse**
  - C. Numbness of extremities**
  - D. Weakness**
17. The course of treatment for someone in a diabetic coma is insulin, fluids and \_\_\_\_\_.
- A. Candy**
  - B. Proteins**
  - C. Lipids**
  - D. Electrolytes**
18. Personal hygiene, \_\_\_\_\_ and keeping clean are very important to watch when caring for someone with diabetes.
- A. Oral care**
  - B. Mental stability**
  - C. Family treatment**
  - D. Energy levels**
19. Long periods of soaking in the bathtub should be avoided to prevent skin breakdowns. T F
20. Symptoms that may signal blood sugar problems in a patient include the following except:
- A. Refusal to eat**
  - B. Vomiting**
  - C. Memory loss**

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