

WHAT IS DIABETES?

Diabetes, often called *diabetes mellitus* by physicians, describes a group of metabolic diseases in which the patient has high blood glucose (blood sugar). This high blood sugar typically is caused by either an inadequate production of insulin or because the body's cells do not respond properly to insulin or both. Patients with diabetes usually experience polyuria (frequent urination), polydipsia (increased thirst) and polyphagia (increased hunger).

Why is it called *diabetes mellitus*? Diabetes comes from Greek, and it means a "siphon". Arêtes the Cappadocian, a Greek physician during the second century A.D., named the condition *diabainein*. He described patients passing too much water (polyuria) like a siphon. The word became "diabetes" from the English adoption of the Medieval Latin diabetes. In 1675, Thomas Willis added mellitus to the term. *Mel* in Latin means "honey", the urine and blood of people with diabetes has excess glucose, and glucose is sweet like honey. *Diabetes mellitus* could literally mean "siphoning off sweet water".

So, what really is diabetes? Diabetes is a disorder of metabolism in which there is an insufficient insulin activity in the body. Insulin is made by the pancreas. Insulin is needed to use the food we eat for energy by allowing glucose to enter cells. When inactivity of insulin does not allow glucose to enter cells, glucose levels rise in the blood which is diabetes.

So what is the pancreas? The pancreas is a large (5-6 inches) elongated gland located behind the stomach. The pancreas has 2 functions.

- a) Secretion of pancreatic enzymes that aid in digestion (exocrine function). 99% of the pancreas does this job.
- b) Secretion of hormones that control various body processes (endocrine function). Insulin is a hormone made by beta cells (Islets of Langerhans) of the pancreas. Only 1% of the pancreas does this job.

So what happens in a person with normal food metabolism?

- a) You eat your breakfast, lunch or dinner.
- b) Food is broken down into simple forms by enzymes in digestive system.

- c) Some of these enzymes are produced in the pancreas.
- d) Most of the food you eat is broken down into glucose and other simple sugars.
- e) Glucose is absorbed into bloodstream to be used by cells for energy.
- f) Some of the non-glucose simple sugars are converted to glucose in the liver.
- g) Blood glucose rises promptly after food is eaten. Insulin is released from the pancreas as blood glucose levels rise up.
- h) Cells have receptor sites on the outside. When insulin attaches to the receptor sites, a passageway opens up and glucose enters the cells. Insulin "opens" the cells like a key.
- i) Most cells need insulin for glucose to enter. Some exceptions are brain, liver and kidney cells receive glucose even with little insulin activity.
- j) Because glucose goes out of the blood into cells, blood glucose levels stay in normal range of 70-115 mg/dl.
- k) Excess food is generally converted to fat and stored.
- l) Usually blood glucose rises to no more than 140mg/dl and returns to normal 2 hours after eating.

So what happens with food metabolism in a person with diabetes?

- a) Food is broken down in the normal way.
- b) Digestive enzymes act in the normal way.
- c) The digestive enzymes produced by the pancreas are not affected by diabetes.
- d) Glucose is absorbed into the bloodstream the normal way.
- e) BUT, there is not enough insulin ACTION.
- f) The key to the cells is missing.
- g) Without insulin action, glucose cannot get into most cells to be used for energy.
- h) Glucose stays in the blood. There is not enough insulin action to maintain normal blood glucose level.
- i) Blood glucose rises, leading to high blood sugar.
- j) Most cells are drowning in glucose on the outside but starving for glucose on the inside.

Current diabetes statistics:

- 8.5% of U.S. population has diabetes- 25.8 million children and adults
- 18.8 million are diagnosed
- 7.0 million are undiagnosed
- 79 million have pre-diabetes
- 1.9 million >20 years old newly diagnosed in 2010
- 215,000 <20 years old have diabetes
- 11.3% of people >20 years old have diabetes- 25.6 million people
- 26.9% of people >65 years old have diabetes- 10.9 million people
- 11.8% of men have diabetes- 13 million men
- 10.8% of women have diabetes- 12.6 million women

There are basically three (3) types of diabetes.

1. Type 1 diabetes- (T1DM), also known as insulin dependent diabetes mellitus (IDDM), juvenile onset diabetes mellitus, and early onset diabetes mellitus. T1DM is the condition where the body does not produce enough insulin. This type accounts for approximately 5% of all cases.
2. Type 2 diabetes- (T2DM), also known as non-insulin dependent diabetes mellitus (NIDDM), adult onset diabetes mellitus, and late onset diabetes mellitus. T2DM is the condition in which the insulin produced is not used properly by the cells (insulin resistance). This type accounts for approximately 95% of all cases.
3. Gestational diabetes- this affects women during their pregnancy.

WHAT IS DIABETES? A REVIEW

1. What is the official medical name for diabetes?
 - a) Diabetes melontosis
 - b) Diabetes major
 - c) Diabetes mellitus
 - d) Diabetes medwise
2. What are the 3 main symptoms of diabetes?
 - a) Polyuria, polydipsia, polyphagia
 - b) Polyester, polygamy, polyover
 - c) Headache, rash, fever
 - d) Headache, rash, polyuria
3. What does the term *diabetes mellitus* mean from Greek language?
 - a) Siphoning of air
 - b) Siphoning of bad air
 - c) Siphoning of water
 - d) Siphoning of sweet water
4. How large is the gland called the pancreas?
 - a) 1-2 inches
 - b) 1-2 centimeters
 - c) 5-6 inches
 - d) 5-6 centimeters
5. Insulin is produced in the pancreas by beta cells in the Islets of what?
 - a) Langerhans
 - b) Longer than hands
 - c) Longer than hats
 - d) Longerhats
6. Insulin "opens" the cells like a what?
 - a) Handle
 - b) Key
 - c) Knob
 - d) Lock

7. What % of U.S. population has diabetes?
- a) 2.5
 - b) 3.5
 - c) 6.5
 - d) 8.5
8. How many people in U.S. has pre-diabetes?
- a) 39 million
 - b) 59 million
 - c) 79 million
 - d) 109 million
9. What type of diabetes is characterized by a lack of insulin production?
- a) 1
 - b) 2
 - c) 3
 - d) 4
10. Gestational diabetes is found in women who are what?
- a) Hard of hearing
 - b) Travels a lot
 - c) Pregnant
 - d) Has more than 6 children