

Diabetes and Biomedical Engineering

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What is Biomedical Engineering? Biomedical engineering is the application of using engineering methods and tools in the medical field. Biomedical engineering is the production of technology used to help those suffering of various diseases, such as diabetes.

What is diabetes? Diabetes is chronic disease involving abnormalities in the body's ability to use sugar. This includes elevated blood sugar for a long period of time and a deficiency in circulating insulin.

There are many different types of diabetes, which include; type 1, type2 and gestational diabetes. Type 1 diabetes, also called insulin dependent diabetes mellitus (IDDM), or juvenile onset diabetes mellitus. It is an autoimmune disease, meaning the body's system for fighting disease turns against the body and kills off a part of the body. Type 2 diabetes, also referred to as non-insulin dependent diabetes mellitus (NIDDM), or adult onset diabetes mellitus (AODM), is when the body produces insulin, but not adequately. Gestational diabetes is when blood sugar levels increase during pregnancy. A majority of the women who go through gestational diabetes end up developing type 2 diabetes later in life.

What is insulin? Insulin is a hormone that has profound effects on the metabolism. Insulin makes cells take glucose from the blood, storing it as glycogen in the liver. When insulin isn't present, the body uses fat as an energy source instead of insulin.

Who can be affected by diabetes? Type 1 diabetes occurs in men and women equally. It is most common in white males. Type 2 diabetes is common in older people, especially overweight women. The people who are affected by diabetes must monitor their diabetes greatly, keeping records of their blood sugar level.

How are the different types of diabetes treated? Type 1 diabetes is treated by intense insulin therapy. This includes multiple insulin injections daily, use of insulin pens and pumps, and use of a new type of insulin called Lispro, which replaces actual insulin quickly. Treatment of

type 2 diabetes involves monitoring blood sugar levels up to 7 times a day, depending on how severe the case is.

How does biomedical engineering come into play? Well, in order to provide treatment for diabetes, one needs to use technology, biomedical engineering technology. This includes insulin pumps, glucose meters, etc. One of the most recent developments is called the Medtronic MiniMed's Guardian RT. This is a new glucose monitor which uses sensors to send readings of the glucose level in the diabetic. This recent upbringing of technology has had scientists hoping on creating a new artificial pancreas. This artificial pancreas would take the role of monitoring glucose levels and at the same time providing proper amounts of insulin to the body.

References

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