Web-Based Tools that Support People with Diabetes and Educate Others

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**GlucoSim**

A web-based educational simulation package for glucose-insulin interaction in the human body, may be used by healthy and diabetic patients.

- Enhanced the Graphical User Interface of the web pages
- Provided more functionality to the web-site
- The Glucose-Insulin level simulations were enhanced
- The graphs were separated by individual body parts depicted by click-able regions
- More explanations provided

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**Diabetes**

Diabetes is a life-long disease characterized by high levels of blood sugar levels. It is a result of too little insulin, resistance to insulin, or both.

**Types of Diabetes**

1. **Type 1**
   - Usually diagnosed in childhood
   - The body makes little or no insulin
   - Daily injections of insulin are required to sustain life

2. **Type 2**
   - Usually occurs in adulthood
   - The body does not respond properly to insulin, resulting in inadequate glucose levels
   - Far more common than type 1
   - Makes up 90% or more of all cases of diabetes
   - Becoming much more common due to:
     - Growing number of older Americans
     - Increasing obesity
     - Failure to exercise

**Gestational diabetes**

- High blood glucose
- Develops at any time during pregnancy in a person who does not have diabetes.

**Pre-Diabetes**

- Occurs when the blood glucose levels are above average
- Not high enough to be counted as diabetes
- Often a precursor to type 2 diabetes

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**Who is at Risk?**

Risk factors for diabetes include, but are not limited to:

- Some ethnic groups (particularly African Americans and Hispanic Americans)
- High blood pressure
- Over the age of 65
- Having little or no exercise
- Delivering a baby weighing more than 9 pounds
- High blood cholesterol levels
- Obesity
- Having a parent or sibling with diabetes

The American Diabetes Association recommends that all adults be screened for diabetes at least every three years. A person at high risk should be screened more often.

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**Complications from Diabetes**

**Emergency Complications**

- **Hyperglycemia** occurs when the blood sugar levels are too high and the body has too little insulin. If not treated immediately, coma or death may occur.
- **Hypoglycemia** occurs when the blood sugar levels are too low. If hypoglycemia is not treated immediately, serious complications arise. These include confusion, drowsiness, change in behavior, coma, and seizure.

**Long-term Complications and Results**

- Kidney failure
- Heart disease
- Limb amputations

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**Statistics**

- All statistics are from the American Diabetes Association (www.diabetes.org)

**For the USA**

- Total Numbers: 20.8 million people (about 7.0% of the population) have diabetes
- Diagnosed: 14.6 million people
- Undiagnosed: 6.2 million
- Pre-diabetes: 41 million
- 1 in 3 Americans born in 2000 will develop diabetes in their lifetime
- Diabetes is the 5th leading cause of death listed on US death certificates in 2002. However, this number is likely to be underestimated

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**Nutritional Information Page:** Information on how to maintain a healthy balanced diet.

**Meal Planning:**

A Nutritional software to assist people in planning their meals and instill a tendency to make healthier food choices.

- Enhanced to make it more user-friendly
- Surveyed 30 individuals with diverse backgrounds for feedback on how to improve the Nutritional website
- Sample meals were added to the site to guide the user towards planning his/her healthy meal.
- A body mass index (BMI) was added to help the user assess his/her obesity level.
- Type 1 and type 2 diabetes information pages added
- 1500 entries added of glycemic index values
- Reference document added defining confusing or unknown terms

**Reference:**

- American Diabetes Association (www.diabetes.org)