Special Note. This month, once again, more important news on how exercise and blood sugar levels are interconnected; and consider how DNA affects the effect of drug therapies.

Taking Control of Your Health

A Monthly Newsletter from Antonella Martino, April 2017

Exercise and Sugar Control

Diabetes today affects nearly half of the USA population including Type I and Type II Diabetics and pre-diabetics already at high risk of being diagnosed with Diabetes if no lifestyle modification is taking place under professional guidance. Diabetes, as it relates to the foods we eat, is a growing concern for the health and wellness of Americans. Nutrition, fitness and education are critical components for preventing and reversing diabetes and other related complications.

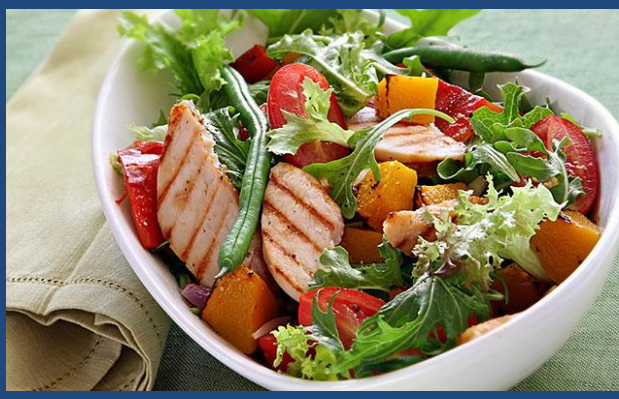
What does exercise have to do with blood sugar control?

The effect that physical activity has on your blood glucose will vary depending on how long you are active, along with several other factors. However, physical activity can lower your blood glucose for up to 24 hours or more after your workout by making your body more sensitive to insulin.

You should become familiar with how your blood glucose responds to exercise. Checking your blood glucose level frequently before and after exercise can help you see the benefits of such activity. You also can use the results of your blood glucose checks to see how your body reacts to different activities. Understanding these patterns can help you prevent your blood glucose from going too high or too low.

Everyone with diabetes should be prepared to treat ***hypoglycemia*** (low blood sugar); people with Type I are at the highest risk for *hypoglycemia* when taking insulin to correct their glucose. People with Type II are less likely to have issues with *hypoglycemia* unless taking several oral medications and insulin to control blood sugar. Keep in mind that low blood glucose can occur during or long after physical activity. It is more likely to occur if you take insulin, skip a meal or don't eat something within 30 minutes to two hours after stopping your exercise for a long or strenuous session.

To maximize your energy for activity, focus on making healthy choices and filling your plate with a balance of non-starchy vegetables, fruits, and healthy fats, while at the same time monitoring your blood sugar closely before and after your exercise.



Make sure you know how to correct for low blood sugar, such as having glucose tablets or a Glucagon pen with you at all times. *It is best not to use soda or candy bars to raise blood sugar.*

Call our Diabetes Education Center for more information.

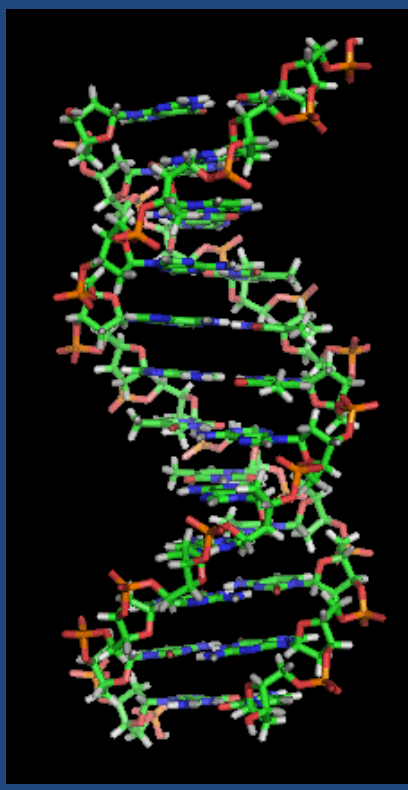
Time To Think of Medications + Your DNA

- **Do you know how important it is for anyone taking medications to have a DNA and pharmacogenomics test?**
- **And are you willing to find out if you are at risk of any future medical conditions?**

Consider some basic information base on Wikipedia's take on the matter.

Pharmacogenomics, a combination of pharmacology and genomics, studies the role of the genome in drug response:

- technology analyzing how the genetic makeup of an individual affects his/her response to drugs; deals with the influence of acquired and inherited genetic variation on drug response by correlating gene expression with ***pharmacokinetics*** and ***pharmacodynamics*** (drug absorption, distribution, metabolism, and elimination), as well as drug receptor target effects.



Both *pharmacogenomics and pharmacogenetics*, used interchangeably, relate to drug response based on genetic influences:

- pharmacogenetics focuses on **single drug-gene interactions**
- pharmacogenomics encompasses **a more genome-wide association approach**, incorporating genomics and epigenetics while dealing with the effects of multiple genes on drug response.

Pharmacogenomics aims to develop rational means of making the most of drug therapy, with respect to the person's genotype, to ensure maximum efficacy with minimal adverse effects.

Pharmacogenomics:

- Seeks to change what is dubbed as the "one-dose-fits-all" approach in treating disease through drug treatments.
- Attempts to eliminate the trial-and-error method of prescribing
- Allows physicians to consider their patient's genes, how these work, and how this may affect the efficacy of the patient's current or future treatments. (It may also explain why past treatments fell short.)

The promise? Precision and even personalized medicine!

- Drugs and drug combinations optimized for each person's unique genetic makeup. Used to explain the response or lack of response to a treatment; act as a predictive tool.
- The hope is better treatment outcomes, greater efficacy, fewer incidents of drug toxicities and adverse drug reactions (ADRs). Facing a lack of therapeutic response to a treatment, alternative therapies could be prescribed to best suit a person's needs.

Pythagoras (yes, that one!) first recognized pharmacogenomics around 510 BC by making a connection between the dangers of fava bean ingestion and hemolytic anemia and oxidative stress. His observation was later validated and attributed to deficiency of ***G6PD*** in the 1950s and called ***favism.*** Although the first official publication dates back to 1961, circa 1950s marked the unofficial beginnings of this science. Reports of prolonged paralysis and fatal reactions linked to genetic variants in people who lacked *butyryl-cholinesterase* ('pseudocholinesterase') following administration of *succinylcholine* injection during anesthesia were first reported in 1956.

Friedrich Vogel of Heidelberg first coined the term ***pharmacogenetic*** in 1959; and ***pharmacogenomics*** first began appearing around the 1990's. The first FDA approval of a pharmacogenetic test was in 2005.

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