



## Insulin Resistance and Metabolic Syndrome

Insulin resistance is a condition in which the body produces insulin but does not use it properly. Insulin, a hormone made by the pancreas, helps the body use glucose for energy. Glucose is a form of sugar that is the body's main source of energy (fuel).

The body's digestive system breaks food down into glucose, which then travels in the bloodstream to cells throughout the body. Glucose in the blood is called blood glucose, also known as blood sugar. As the blood glucose level rises after a meal, the pancreas releases insulin to help cells take in and use the glucose.

When people are insulin resistant, their muscle, fat, and liver cells do not respond properly to insulin. As a result, their bodies need more insulin to help glucose enter cells. The pancreas tries to keep up with this increased demand for insulin by producing more. Eventually, the pancreas fails to keep up with the body's need for insulin. Excess glucose builds up in the bloodstream, setting the stage for diabetes. Excess glucose in the bloodstream also converts into fat and shows up on laboratory test as high triglycerides. Many people with insulin resistance have high levels of glucose, insulin and fat circulating in their blood at the same time.

Insulin resistance increases the chance of developing type II diabetes and heart disease. Insulin Resistance also wreaks havoc on the rest of the endocrine system—the system of glands that controls many bodily functions including the gonads, pituitary, thyroid, and adrenal glands.

Symptoms of Insulin Resistance include:

- fatigue after meals
- craving sweets
- eating sweets does not relieve cravings for sweets
- needing sweets after meals
- increased thirst or appetite
- difficulty losing weight
- PCOS (polycystic ovarian syndrome) in women

Many people with Insulin Resistance also have high adrenal function with elevated cortisol that includes symptoms of:

- difficulty falling asleep
- excessive perspiration



- feeling stressed
- waking up tired even after adequate sleep
- weight gain under stress

Insulin Resistance may also cause testosterone levels to rise in women causing increased facial hair, acne, and aggression and estrogen levels to rise in men causing growth of the breasts, loss of libido, more emotional expression, and depression.

Insulin Resistance is caused by, in some instances, genetics and most commonly by the SAD SAL—the Standard American Diet, consisting of ever increasing amounts of refined carbohydrates and bad fats, and the Standard American Lifestyle of skipping breakfast, grabbing unhealthy food on the run, not enough exercise, high amounts of caffeine, too much alcohol, high stress and not enough sleep.

Many people with insulin resistance and high blood glucose have other conditions that increase the risk of developing type II diabetes and damage to the heart and blood vessels, also called cardiovascular disease. These conditions include having excess weight around the waist, high blood pressure, and abnormal levels of cholesterol and triglycerides in the blood. Having several of these problems is called *metabolic syndrome* or insulin resistance syndrome, formerly called syndrome X.

**Metabolic Syndrome** is defined as having any three of the following:

- waist measurement of 40 inches or more for men and 35 inches or more for women
- triglyceride levels of 150 milligrams per deciliter (mg/dL) or above, or taking medication for elevated triglyceride levels
- HDL, or “good,” cholesterol level below 40 mg/dL for men and below 50 mg/dL for women, or taking medication for low HDL levels
- blood pressure levels of 130/85 or above, or taking medication for elevated blood pressure levels
- fasting blood glucose levels of 100 mg/dL or above, or taking medication for elevated blood glucose levels

### **Supporting Insulin Resistance**

#### Diet and Lifestyle

Correcting or managing Insulin Resistance is critical due to the increased risk of stroke, heart disease and diabetes associated with Insulin Resistance. A healthy diet and lifestyle are both equally important for managing Insulin Resistance. The following supportive recommendations are by no means exhaustive, but are a concise summary of necessary diet and lifestyle changes to support Insulin Resistance:



1. Simple carbohydrates in the diet must be reduced, such as sugar, corn syrup, high fructose corn syrup, and items made with flour. Your diet should include carbohydrates with a low glycemic index. <http://www.glycemicindex.com/>
2. You need to engage in an exercise program including both aerobic and resistance training at least five days per week.
3. You need to establish a good sleep routine getting at least 6 ½ to 8 hours of sleep per night. Emphasize going to bed and especially waking at the same time every day.
4. Stress by itself can directly cause or contribute to insulin resistance. Managing your stress is very important—take a 20 minute walk at lunch, meditate, take up Yoga or Tai Chi.

Often patients struggle with only the diet and lifestyle approach. We have many options in the office for helping patients recover from insulin resistance and metabolic syndrome. We have helped hundreds recover from this potentially life-threatening condition. Let us help you today!