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# Insulin Resistance and Metabolic Syndrome

**What is Insulin Resistance?**

Insulin is a hormone. It helps your body move sugar from the blood stream into the muscles and the liver where the sugar is used as fuel or converted into fatty acids that are later moved into the fat cells and are stored as energy there.

In some people, a condition of abnormal metabolism develops that causes muscle and liver cells to not respond as readily to insulin and the body has to create higher and higher levels of insulin in order to maintain a normal blood sugar. Doctors refer the metabolic abnormality that causes escalating levels of insulin as Insulin Resistance.

**Why is Insulin Resistance Important?**

Insulin resistance increases the risk of medical conditions such as:

1. An increase in a dangerous form of fat that builds up in our abdomen below the muscles.
2. Inflammation and damage of the blood vessels (Atherosclerosis)
3. Elevated blood sugar (Type II Diabetes Mellitus)
4. Low HDL cholesterol levels (the good or healthy cholesterol)
5. Elevated triglycerides
6. High blood pressure (Hypertension)
7. Heart Attacks (Myocardial Infarction).

When many of these problems occur together, doctors refer to it as Metabolic Syndrome.

**What Causes Insulin Resistance?**

Many differ things may contribute to Insulin Resistance:

1. Aging
2. Our genetic make-up
3. Weighing too much.
4. Eating too many carbohydrates (sugars and starches)
5. Not enough exercise
6. Some unusual medications.

Of all of these, the most important are felt to be increased body weight, excessive carbohydrate intake and decreased exercise.

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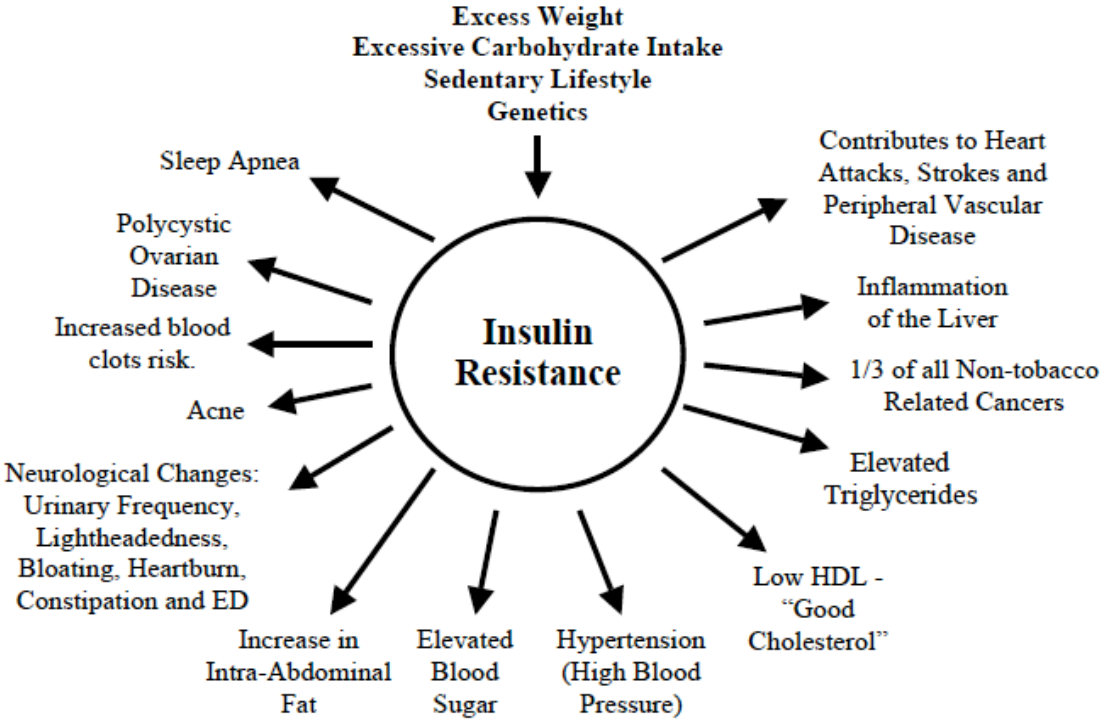
**How do I know if I have Insulin Resistance?**

Insulin resistance is difficult to measure by a simple blood test so doctors depend on a combination of other simple lab tests and medical conditions in order to make the diagnosis.

If one or more of the following is true for you, you may very likely have Insulin Resistance:

- Body Mass Index is equal to or greater than 29.
- Fasting blood sugar level that is higher than normal (>100).
- Fasting triglycerides are higher that 150.
- HDL Cholesterol is less than 50 for women or 40 for men.
- You have an excessive amount of fat around your waist (> 40 inches for Men & > 35 inches for Women; measure a relaxed abdomen at the midpoint between the top of the pelvis and the lowest rib of your flank)
- One (or more) of your brothers, sisters or parents has been diagnosed with diabetes.
- A history of Diabetes during pregnancy.
- Have been diagnosed with Sleep Apnea.
- Have been diagnosed with Polycystic Ovary Syndrome.
- Have been diagnosed with Fatty Infiltration of the Liver.
- You have a skin condition known as Acanthosis Nigricans.



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**What are the Symptoms of Insulin Resistance?**

**Insulin Resistance usually has no symptoms.** People may have Insulin Resistance for several years without noticing anything.

Insulin Resistance might cause some changes in your nervous system that cause symptoms. Common from nerve dysfunction could be:

| | |
|---|---|
| Lightheadedness Upon Standing | Rapid Heart Rate |
| Sleep Disturbances | Frequent Urination, Day or Night |
| Urinary Dribbling | Abdominal Bloating |
| Rapid Fullness with Meals | Frequent Nausea |
| Excessive Sensitivity to Light | Erectile Dysfunction |
| Inability to Ejaculate | Sweating after Meals |
| Flushing of the Skin | Constipation |
| Heart Burn | Dry Mouth |

Fortunately, the majority of these problems will go away with reversal of Insulin Resistance.

**What is Metabolic Syndrome?**

Metabolic Syndrome is a sub-diagnosis of the Insulin Resistance and is associated with a marked increase in cardiovascular disease (Stroke, Heart Attack, Peripheral Arterial Disease) and Diabetes Mellitus. It is a very common and dangerous medical problem.

Metabolic Syndrome is defined as the presence of an increase in waist circumference (waist measurement of more than 40 inches for men and more than 35 inches for women) and 2 or more of the following health conditions:

1. Triglycerides blood level of 150 mg/dL or more
2. HDL cholesterol levels below 40 mg/dL for men and below 50 mg/dL for women
3. Blood pressure of 130/85 mm HG or higher
4. Pre-diabetes (a fasting blood sugar between 100 and 125) or diabetes (a fasting blood sugar level over 125 mg/dL).

**How Common is Metabolic Syndrome?**

The Metabolic Syndrome can be found in:

1. 25% of the US adult population.
2. More than 40% of people over 60 years old.
3. More than 20% of people under the age of 40 years.
4. Hispanic/Latino Americans have a higher risk for Metabolic Syndrome than non-Hispanic whites or African Americans.

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**What Causes Insulin Resistance and Metabolic Syndrome?**

The last 20 years has seen an epidemic rise in Obesity, Metabolic Syndrome and Diabetes Mellitus in the United States. Extensive research has helped us to understand that the combination of high carbohydrate diets, lack of exercise and increased portion sizes has lead to this problem.

Pre-historic humans were designed to consume approximately 1 cup of carbohydrates (starches and sugar) per year. The modern American consumes 1-2 cups per day! Simply put, we are not designed to consume the large amounts of carbohydrates we commonly do.

Additionally, our intake of high fructose corn syrup has risen from about 0.5 cups per person per year in 1970 to 90 cups per person per year in 2007! Recent research suggests that the increase in high fructose corn syrup may in fact be the single most important cause in the Diabetes epidemic in the United States!

Additionally, the increase in obesity has also been driven by the fact that we are a much more sedentary culture and have become somewhat accustomed to the "Super-Size" portions that the food industry has been serving up over the last 20 years.

**How are Insulin Resistance and Metabolic Syndrome Treated?**

The key to tackling the Metabolic Syndrome lies in a better detection, earlier diagnosis and effective treatment of Insulin Resistance.

While no single treatment for the Metabolic Syndrome as a whole yet exists, we know that lifestyle changes such as weight loss and decreasing simple carbohydrates in your diet can **reverse Metabolic Syndrome in many people with as little as a 5-10% decrease in their body weight**.

**Do You Have Metabolic Syndrome?**

The presence of **3 of the following 5 criteria** means you have Metabolic Syndrome:

| | | |
|---|---|---|
| Yes | No | Systolic blood pressure greater than 130 or diastolic blood pressure >85 or on treatment for hypertension. |
| Yes | No | Central Obesity (more than 40 inches for men or 35 inches for women) |
| Yes | No | Fasting blood sugar greater than 100 mg/dl or on treatment for elevated blood sugar. |
| Yes | No | Triglycerides >150 mg/dl or on treatment for elevated triglycerides. |
| Yes | No | HDL Cholesterol levels below 40 mg/dl for men or 50 for women. |