

# Diabetes & Endocrinology Consultants

## Insulin Resistance

Insulin resistance (IR) is a common genetic disorder affecting one in three Americans. This disorder can lead to problems with obesity, high blood pressure, high fats in the blood, irregular periods and excessive hair growth in women and eventually diabetes. People with insulin resistance are at risk for heart disease, stroke, and other diseases. Even children and young people may have IR. These families usually have a history of diabetes or early heart disease.

IR is passed down from your parents and is greatly affected by the foods we eat and the amount of activity we do on a daily basis. In overweight people, weight loss is very helpful in treating this condition.

### NORMAL DIGESTION

Food goes to the stomach to be changed (digested) from protein, fat and carbohydrates. These three nutrients are the building blocks and the energy that our body needs to work. Carbohydrates (CHO) change to sugar the fastest. They are changed into the fuel our body needs to work. CHO come from starchy foods and sugars. During meals containing carbohydrates, our body releases more insulin to keep the blood sugar from going up.

The sugar is then carried to the body cells through the blood so it can be used for energy. However, the sugar cannot go into the body cells by itself; it needs insulin to open the door to the cell. Insulin works to allow sugar into the muscle, fat, and liver cells of the body.

Insulin is made by the pancreas and goes into the blood at low levels all the time to prevent the liver from releasing excess sugar and at higher levels when we begin to eat carbohydrates. The insulin and the sugar go through the blood together. When they get to the body cell, the insulin opens the door to the cell and the sugar goes in and is used for energy.

In people with IR, the insulin has trouble getting the door opened so the pancreas has to send out more insulin to help get the door open. This means the pancreas has to work at least twice as hard! Some people have to make over 5 times the normal amount of insulin to keep the blood sugar normal.

After the insulin opens the door and the sugar goes into the cell, the extra insulin goes to work storing extra fat around our waist. It also stores the fat in our blood vessels (as cholesterol and triglycerides) and in our liver. It also causes the ovaries not to release eggs, which causes irregular periods and problems getting pregnant. The ovaries also make more male hormone, which leads to excess hair growth in women. The high levels of insulin also thicken and darken the skin in the creases of the body such as the back of our neck, armpits, elbows, etc.

Insulin may not be released at the appropriate time after eating so that the blood sugar goes too high after eating carbohydrates and then too low at the next meal. The blood sugar may then go too low causing hypoglycemia. A common time for these symptoms to occur would

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be about 2-3 hours after eating cereal for breakfast. Some of the most common breakfast foods are carbohydrates (cereal, bagels, toast, grits). These carbohydrates stimulate insulin release leading to fluctuations in the blood sugar between breakfast and lunch and create more hunger during that time as well.

Over the years, the extra insulin makes the blood pressure go up along with the blood fat levels. As the pancreas gets tired of making extra insulin, the insulin levels drop enough to allow the sugar level to increase in the blood.

There are different names for the different levels of blood sugar. When a person's blood sugar is 126 or more before eating breakfast (fasting) or over 200 any time, he or she has diabetes. Impaired glucose tolerance is a blood sugar between 140-199 in 1-2 hours after drinking a very sweet drink called glucola. Impaired fasting glucose is a blood sugar between 110-126 before breakfast. However, any blood sugar over 95 before breakfast can increase your chance of having heart disease.

### TREATMENT

IR can be treated with diet, exercise and medication. The diet should control the amount of CHO eaten at each meal. High fiber food is also helpful in controlling how much insulin is needed for each meal by slowing down how fast the sugar goes into the blood. By limiting how many starchy foods you eat, you will notice that you are less hungry and have more energy.

Regular exercise makes the body cells less resistant to the insulin. This effect lasts for 12-13 hours after moderate exercise such as walking for 30 minutes. You should strive to exercise for at least 30 minutes every day.

There are several medications that help with insulin resistance and, hopefully, will keep you from getting diabetes. Your doctor will decide which one is the best for you. Remember to take the medication the way your doctor tells you.