

## **Nutrition and Exercise Approaches to Correcting Insulin Resistance and the Metabolic Syndrome**

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### **What is Insulin Resistance?**

Insulin resistance is an underlying condition that affects more than half of all Americans. It is characterized by higher than normal levels of blood glucose and higher than normal levels of insulin. It is a condition in which insulin no longer performs its intended role of allowing glucose to enter cells to be utilized as energy. Glucose, a simple sugar or monosaccharide, is the body's main fuel to produce energy. After years of eating highly refined carbohydrates such as table sugar found in baked goods, chocolates and other candies, soft drinks, high fructose corn syrup, and products made with white flour, the receptor sites for insulin on cells no longer function to allow glucose entry into the cells. The condition is hastened in people who are alcoholic and who consume more than two alcoholic drinks a day.

Insulin resistance is accompanied by glucose intolerance. The symptoms include carbohydrate cravings, hypoglycemia, irritability, mood swings, and drowsiness after eating, and erratic behavior due to blood sugar fluctuations.

Fifty five percent of Americans are overweight which means that they are all insulin resistant, at least to some degree. Another 10 to 25% of Americans are also insulin resistant but not overweight. Insulin resistance and glucose intolerance progress to the Metabolic Syndrome, also called Syndrome X, which is characterized by obesity, hypertension, high cholesterol and triglycerides, along with abnormally high blood levels of glucose and insulin. The Metabolic Syndrome most often leads to full blown Type II Diabetes, the fastest growing disease in America.

### **What is the Metabolic Syndrome and What are its Effects?**

As mentioned above, the Metabolic Syndrome is caused by insulin resistance and glucose intolerance. It is usually a precursor to Type II Diabetes, but is also implicated in heart disease, some forms of cancer and even the dreaded Alzheimer's disease. Recent research at Brown University has shown that Alzheimer's disease is very closely related to Type II Diabetes. In fact, it is so close to adult onset diabetes that it has been called Type III Diabetes by the researchers at Brown University. So, it is now obvious that insulin resistance is connected to several other diseases, and although it may not be a direct cause of some of these illnesses, it is a contributing factor.

### **What Are the Effects of Too Much Insulin?**

As bad as glucose overload is, high levels of insulin in the blood are probably worse because of its powerful action on our physiology. What is different about insulin when compared to other hormones is that you don't have to take it in a pill or be injected with it

to develop abnormally high levels of it. All that is necessary is for you to eat the typical American diet containing large amounts of sugar, white flour and other simple carbohydrates that stimulate insulin production. There is considerable evidence that the overproduction of insulin is the root cause of many health problems which plague Americans today.

Too much insulin in the blood stream is associated with steady weight gain because the unused glucose is converted to fat which is stored in the body. This is why we see so many overweight Americans who are insulin resistant. Insulin is also associated with oxidized LDL cholesterol which damages the cells lining your arteries and is a cause of plaque build up. Insulin can also stimulate cell division and affect genes, which can lead to cancer. According to Burton Berkson, MD, author of the informative book *Syndrome X*, insulin can increase the risk of colon, liver, pancreatic, breast, and endothelial cancers. High levels of insulin cause the retention of sodium leading to hypertension and an increase in the formation of free radicals which are implicated in heart disease and cancer. In fact, free radicals are implicated in virtually every disease process.

Another cause of elevated levels of insulin is stress. Americans are a highly stressed people. Many of us work too much, fail to get the required amount of sleep, and worry excessively leading to severe stress. When this happens, our adrenal glands secrete cortisol, the principal stress hormone which boosts glucose levels and causes the pancreas to release more insulin. High levels of cortisol are a high risk factor in cardiovascular disease as well as a cause of weight gain.

### **Missing Nutrients:**

The typical American diet consists of processed foods that have been stripped of almost all nutrients. Some of these foods are fortified, i.e., some vitamins and minerals have been added back in, but scores of nutrients are still missing, including many vital minerals and trace elements. The modern diet is practically devoid of antioxidants which protect against free radicals and play an important role in metabolizing all carbohydrates. Anti oxidant levels can be measured and it should be no surprise that in pre diabetics (those suffering from the Metabolic Syndrome) and diabetics antioxidant levels are exceedingly low. So any attempt to correct these conditions must correct the basic diet and include certain antioxidant supplements such as alpha lipoic acid, chromium, vitamins C and E, etc.

### **Some Dietary Principles to Avoid the Metabolic Syndrome:**

1. Avoid all refined carbohydrates, including products made from white flour and that contain table sugar (sucrose), high fructose corn syrup and artificial sweeteners (these have no calories but stimulate insulin secretion), white rice and white bread.
2. Eat foods in as close to their natural state as possible. This means eat as much raw food as you can emphasize brightly colored and leafy green vegetables and fruits, and buy them from organic food stores to avoid pesticide and other chemical residues. Emphasize non starchy vegetables as your primary source of carbohydrates. If you are

already diabetic or pre diabetic, you must limit your intake of all carbs, even these very nutritious kinds.

3. Avoid all soft drinks including diet drinks. Limit your intake of alcohol to no more than four drinks a week. The safest form of alcohol is red wine and the most nutritious beers are the dark varieties. Hard liquor should be shunned, especially if you are insulin resistant or diabetic. Also avoid fruit juices since they are high in sugar.
4. Cut back on Omega-6 oils such as corn, soy, safflower, etc. which are known to promote inflammation and disrupt bodily processes. Use extra-virgin olive oil, coconut, sesame, macadamia nut oils, and butter for cooking. Bear in mind that heating any oil until it smokes damages it and is a source of free radicals. The best cooking oils are coconut, sesame, and macadamia nut because they have a higher smoke point than olive oil, which should be used only for light sautéing and in salads. If you dislike the taste of coconut oil you can use a mixture of one third coconut oil, one third extra-virgin olive oil, and one third sesame oil. Another alternative is to cook with a half and half mixture of butter and coconut oil. Never use margarine or any oils containing trans fats, hydrogenated or partially hydrogenated fats. Read food labels and you will be astounded at the number of foods containing these unhealthy fats, including most commercially produced peanut butter. And be sure not to eat any deep fried foods like McDonald's French fries.
5. Add Omega-3 fatty acids to your diet. Eat plenty of cold water fish such as trout, lake trout, salmon, mackerel, halibut, tuna, sardines and anchovies. Because tuna tends to concentrate mercury, eat it only once a week. Add flax seed meal to your diet, or flax seed oil to salad dressings. Eat walnuts and consume plenty of Omega-3 eggs now available in most grocery stores. You may also take Omega-3 supplements available where vitamins are sold.
6. Never skip breakfast and have some protein at every meal. Ideally, breakfast should be your largest meal.
7. Drink plenty of water each day, approximately half your weight in ounces. So if you weigh 200 lbs, drink 100 ounces of water. Some of your liquid intake may be in the form of green tea or black tea. Limit coffee to one or two cups a day. Do not include beer or other alcoholic drinks in the total.

### **The Glycemic Index (Simplified):**

The glycemic index is a scale based on the rate at which a food is broken down to the simple sugar glucose and how fast it enters your blood stream. The higher the rating the more undesirable the food is in terms of stimulating an insulin response by your pancreas. The lower the rating the more desirable is the food. Diets rich in high glycemic foods lead to insulin resistance.

#### High Glycemic Foods:

White bread is the highest, followed by breakfast cereals made from processed grains such as corn flakes, and muesli, and especially those cereals coated with sugar. Even whole grain breads are high on the index but can be eaten in moderation. All instant

cereals are high on the glycemic index as are corn chips, potato chips, honey and table sugar, so don't sweeten your coffee or tea.

#### Moderate Glycemic Foods:

Foods like yams and slow cooking oatmeal (Irish Oats) and many beans such as canned kidney beans, pinto beans, peas and navy beans.

#### Low Glycemic Foods:

Included here are such vegetables as fresh cooked kidney beans, lima beans, lentils, black eye peas, and chick peas.

Most dairy products like milk, yogurt, etc.

Most fruits such as peaches, plums, cherries, grapefruits, etc. and all non starchy vegetables are low on the glycemic scale.

You may request my eating plan for a more complete list of fruits and vegetables.

#### **Physical Activity to Combat the Metabolic Syndrome:**

Along with dietary modifications, exercise is undoubtedly the next most important element in avoiding the metabolic syndrome. It is one of the best ways to increase insulin sensitivity. You should exercise about five or six days a week. You need not be a marathon or ultra marathon runner or a tri athlete to derive benefit from exercise. In fact there is considerable evidence that many endurance athletes actually harm themselves from excessive exercise. The same thing is true for body building and power lifting, which for many people cause unwanted injuries. So, you don't have to join a gym to exercise. However, many gyms have numerous group exercise classes from spinning, and kick boxing to body pump, which are good ways to get some exercise and stay motivated. Racquet games such as badminton, tennis, racquet ball and squash are excellent ways to stay fit and have fun doing it.

Walking for up to an hour a day, swimming up to a mile a day, recreational biking, hiking trails, light weight lifting, or a mixture of these activities is all that is needed. I would add gardening and yard work to the list as well. Some elitists disparage the latter as grunt work; however, the truth is that the human body was designed for such work and those who engage in it are better off for it. Dancing is yet another way to exercise and have fun at the same time.

Besides increasing insulin sensitivity, exercise helps you burn calories, build muscle and increase strength, lowers body fat, and in sensible amounts improves immunity to disease, improves sleep, boosts feelings of wellbeing, reduces stress, improves concentration, reduces blood pressure, lowers blood glucose, cholesterol, and triglycerides.

## **Supplements to Combat the Metabolic Syndrome:**

Certain nutrients have been shown to be effective in promoting insulin sensitivity. When used in conjunction with a proper diet and exercise, it is possible to avoid insulin resistance and even reverse the Metabolic Syndrome and Type II Diabetes. There are nutritionally oriented doctors who have had amazing results with this approach without the use of pharmaceuticals such as Avandia, now proven to be quite dangerous.

Most important of these supplements is alpha lipoic acid, used in Germany by physicians for many years to reverse diabetic nerve damage. Burt Berkson, MD says, "Conventional medical therapy often tries to accomplish this through intensive insulin therapy, but the drawback is that these injections increase the risk of cardiovascular disease." Because alpha lipoic acid reduces free radicals, it has a decided anti-aging effect. It also greatly improves insulin sensitivity which reduces blood levels of glucose. High levels of glucose enter into a reaction with proteins called glycation, which denatures proteins in various bodily structures and speeds up aging. So by reducing both glycation and free radicals alpha lipoic acid can actually reverse the aging process to some degree. Its action appears to be enhanced by the presence of vitamins C and E and Gamma-linolenic acid, also called GLA for short. The richest food source of alpha lipoic acid is spinach, but because much of it is bound to a protein it is not as bioavailable as the free form found in high quality supplements. 50 to 100 mg/day of alpha lipoic acid is sufficient as a prophylactic for perfectly healthy people. Higher doses are appropriate for people showing signs of insulin resistance, the Metabolic Syndrome and for Type II Diabetes.

As mentioned above, vitamins C and E are also of importance in the fight against insulin resistance. Of the two, vitamin E may be the most important since studies have shown that it protects against heart disease. The most impressive of these studies was published in the British medical journal *Lancet*, which demonstrated that 400 to 800 IU/day of vitamin E given to 2000 patients diagnosed with heart disease caused the incidence of non fatal heart attacks to drop by 77 % when compared to the placebo group.

Chromium is undoubtedly the most important mineral in the regulation of glucose metabolism and in the prevention of insulin resistance. It seems that chromium increases insulin efficiency thereby slowing aging effects caused by glycation. One of the best forms of chromium is chromium piccolinate because it is readily absorbed. Zinc and magnesium are also very important minerals in the prevention and treatment of insulin resistance. Omega-3 fatty acids also improve glucose tolerance and can also help in weight reduction.

There are several herbs used throughout the world to improve insulin sensitivity and promote circulation. The most common is garlic which has only modest effects lowering glucose levels but does greatly improve cholesterol and triglyceride levels. Everyone should eat plenty of garlic and onions as heart healthy foods. Bitter melon, sold in oriental delicatessens and found on the menu in some Chinese restaurants can improve

glucose tolerance dramatically and can be eaten as a side dish or its juice can be drunk as a decoction.

*Gymnema sylvestre* is an herb used in Ayurvedic medicine since ancient times to treat Type II Diabetes. Its action has been confirmed by scientific studies. Because *Gymnema* is very bitter it is best to take it in supplements.

If you have questions concerning this article, call me at 301-871-6049 or 240-888-5453.