# Metabolic Syndrome - Precursor to Diabetes

Left to right: Kristina Moore, RD, CDE; Philip Shaver, MD, panel moderator; and Elke Jost-Vu, MD

It is estimated that as many as one in four Americans have a combination of metabolic disorders, known as metabolic syndrome, that increase their risk of heart disease, diabetes and stroke, and that approximately 40 percent of adults over age 40 have this condition.To learn more about the health risks this condition poses, Healthy Living magazine assembled three prominent practitioners from Eisenhower Medical Center to discuss prevention and treatment of metabolic syndrome.They included Elke Jost-Vu,MD, Medical Director of Eisenhower Medical Center Diabetes Program, and Kristina Moore, RD, CDE, a registered dietician with Eisenhower. Philip Shaver, MD, a Board Certified Cardiologist at Eisenhower Medical Center served as moderator.

Dr. Shaver: As a background, our nation has grown progressively heavier and more obese over the last several years.The price we pay for this increasing obesity in our country is a syndrome referred to as a metabolic syndrome.The metabolic syndrome is a clustering of five risk factors: abdominal girth – waist circumference greater than 40 inches in men or 35 inches in women; elevated triglycerides greater than 150 mg; a low HDL less than 40 in a man or less than 50 in a woman; high blood pressure – 130/85 or greater, or on therapy for high blood pressure; and a fasting glucose that is over 100. A number of these people also have insulin resistance. Is there any use in measuring insulin in these patients, Elke? Dr. Jost-Vu:

Insulin levels can be measured.There is a formula available expressing the degree of insulin resistance.This is derived by multiplying fasting insulin and glucose levels. Most patients with insulin resistance can be identified by weight, family history of diabetes and abnormal lipids. Dr. Shaver:

It is estimated that about 47 million Americans have the metabolic syndrome. It increases with age and body weight, so if you are 20 to 29 years of age, the incidence is around 6.7 percent. If you are in the age group of 60 to 69 years of age, the incidence is about 43.5 percent. Are there any ethnic groups more prone to the syndrome? Dr. Jost-Vu:

I would say the prevalence of metabolic syndrome in some ethnic groups is much higher, namely Latinos,African-Americans, American Indians and Polynesians. Here, in our valley, there is a large population of Latinos at high risk. In addition, the rate of obesity in our teenagers is supposed to be about 15 percent, but research shows that in Latinos it is about 25 to 30 percent, and the majority of those are girls who are overweight. Most of these teenagers are at risk to develop the metabolic syndrome or diabetes. Dr. Shaver:

Our nation has grown progressively more obese over the last several years. In a way, this seems to have coincided with our increased intake of carbohydrates. Kris, isn't diet really paramount? Ms. Moore:

Yes.You are so right. Food is our fuel and we must eat properly to achieve or maintain good health.We, as dietitians, have a constant battle with our first amendment. The people in this country are so confused with what they should eat.The newspaper says "no fat," the Internet says "no carbohydrates," the literature says "good" carbohydrates and no "bad" carbohydrates! This confusion has led to poor diet habits and obesity. I have strong hopes that our new Dietary Guidelines for Americans that is expected to go public in May 2005 will address simple ways to promote good nutrition. Dr. Shaver:

Well, there are good carbohydrates and bad carbohydrates. Explain this rather controversial area of the glycemic index. Ms. Moore:

In the past, carbohydrates were separated into two groups: sugar and white foods (bad), and non-white starches (good). It has been found that some people are more sensitive to certain carbohydrate foods than to others. Studies were done in this area, and the term "glycemic index"was used to identify the extent to which a food affected the blood glucose.The problem is that there are too many variables. One person may be sensitive to apples, where the next person may be sensitive to pears.The glycemic response to food is individual.This has been a controversial issue. Dr. Shaver:

Aren't there certain carbohydrate sources, high in fiber, that don't raise insulin as high, that absorb slower? Ms. Moore:

Yes.The carbohydrate sources that are rich in soluble fiber are more slowly absorbed, so they decrease the rapid elevation of the blood glucose. Soluble fibers are found in fresh fruits, most vegetables, dried beans, lentils and oatmeal. Dr. Shaver:

Would you recommend that we get our carbohydrate source from fruit and vegetables, rather than those other things that have a high glycemic index? Ms. Moore:

Yes. I definitely encourage "healthy" carbohydrates. Just because a food has a low glycemic index, does not mean it is a healthy choice. Many foods, such as angel food cake, may have a lower glycemic index than a baked potato, but how about the nutrition? It is better to count carbohydrates and concentrate on good nutrition. Dr. Shaver:

We are attuned to this thing about the bad cholesterol, so called LDL cholesterol. But actually, the LDL cholesterol is not all that high in patients who have insulin resistance and diabetes, but it is a small particle.The small LDL particles actually do penetrate the arterial wall more readily and ultimately cause this plaque within the arteries. Elke, what causes the elevation in triglycerides and low HDL? Dr. Jost-Vu:

I think it all stems from insulin resistance. Insulin by itself removes the fat from the blood and builds it up in the fat cells.With insulin resistance, fat is not cleared from the blood. This leads to elevated triglycerides and decreases production of good cholesterol, in other words, HDL. Dr. Shaver:

Elke, I would be interested, what do you advise a 65-yearold woman who is 40 pounds overweight, who has arthritis in her knees, and tells you she just can't exercise. Dr. Jost-Vu:

I would tell her to swim or walk in the pool, do some stretching exercises, or light weights, or try to do yoga. Dr. Shaver:

The Diabetes Prevention Project took a group at risk for diabetes and recommended 150 minutes of exercise a week.They had a substantial weight loss of about 7 percent, and they showed a significant decrease in the development of diabetes. Intervention works! The best way to do that is diet and exercise. Kris, do you have feelings about exercise? Ms. Moore:

Very much so.To treat or prevent the metabolic syndrome, exercise goes hand-in-hand with diet. It is necessary to eat less, and exercise more, to lose body fat.This can be a problem when it comes to the scale. Muscle is dense and heavy, so if someone loses fat and gains muscle, the scale will show no change in weight. I am more interested in seeing a decrease in clothing size or the gain of two extra holes in the belt, than seeing a loss in weight. Dr. Shaver:

We also always talk about patients being their own advocates — to know their waist size and their blood pressures.They need to know their HDL and their triglycerides, because that is a major criteria for the syndrome…and also their fasting sugar. The more of the five risk factors of metabolic syndrome you have, the more you are at-risk for cardiovascular disease. Fat that is sitting in the abdomen causes insulin resistance. It puts out inflammatory substances that we think leads to damage of blood vessels that can cause progression of atherosclerosis, and that's why we see a good deal more cardiovascular disease in these patients. Dr. Jost-Vu:

Yes,we differentiate between "macrovascular" and "microvascular" disease. Macrovascular disease is caused by the metabolic syndrome. Microvascular disease, the disease of the capillaries, is found in people with diabetes and caused by elevated blood sugar. Dr. Shaver:

Macrovascular disease, the strokes, heart attacks, and the amputations from peripheral vascular disease, start before a diagnosis of diabetes.When you have a blood sugar level of over 100, or you have this physique with abdominal obesity, or blood pressure in that range, or an at-risk lipid pattern…the clock is ticking! This can partly be reversed through diet and exercise. I'm often asked, what kind of exercise should I do, and my reply is — something you'll keep doing! Ms. Moore:

I agree, exercise has to be enjoyable. It doesn't matter what you do. Did you know that vacuuming a carpet expends the same amount of calories as cross-country skiing? Motion of any kind is exercise. Exercise is just like diet and needs to fit into the lifestyle. Dr. Shaver:

Also, the Renker Wellness Center does have an exercise program that people can join as a gym. It's on the Eisenhower campus and run by very well trained personnel, who are quite familiar with cardiovascular disease. Elke, what else would you recommend? Dr. Jost-Vu:

Exercise, in my opinion, is really the key to everything, and even more important than diet. For instance, if a patient is diagnosed with a fasting blood sugar of 130 to 135, the moment this person exercises and changes their eating habits the fasting blood sugar, a month or two later, will be down to 90! Dr. Shaver:

In conclusion,we know that there are misconceptions about metabolic syndrome and diabetes. Dr. Jost-Vu, can you elaborate? Dr. Jost-Vu:

You can see the diagnosis of diabetes is really the end result of a condition that began 15 to 20 years prior. It all starts with insulin resistance, meaning the insulin itself is not functioning correctly to remove the sugar from the blood stream.This causes the pancreas to overcompensate, making more and more insulin. So, a person with insulin

resistance has normal blood sugar levels, but very high levels of insulin. In other words, the insulin resistance, metabolic syndrome, and all those cardiovascular risk factors, begin long before the onset of diabetes. I think that people who want to know if they have the metabolic syndrome should have a fasting blood sugar level once a year.They should also have the lipid levels checked, their blood pressure checked and live a healthy lifestyle. Ms. Moore:

Living a healthy lifestyle includes good diet habits and daily exercise.

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