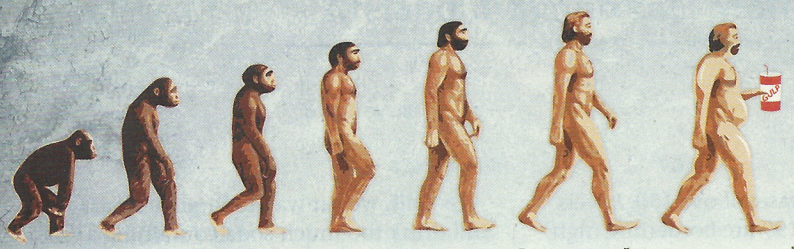
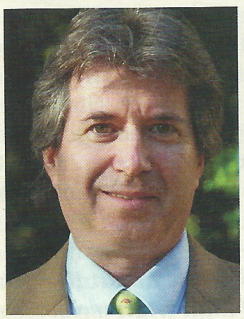


Metabolic Meltdown

How a spare tire leads to diabetes & heart disease



Michael Miller is the director of the Center for Preventive Cardiology and a professor of medicine, epidemiology, and public health at the University of Maryland School of Medicine. He chaired the panel of experts that wrote the American Heart Association's 2011 "Statement on Triglycerides and Cardiovascular Disease," and he co-authored the *AMA Guide to Preventing and Treating Heart Disease* (Wiley, 2008). Miller spoke to *NAH*'s Bonnie Liebman by phone from Baltimore.

One out of four American adults now have what experts call the metabolic syndrome. Its five features—a large waist, low HDL ("good") cholesterol, and higher-than-normal (but not necessarily high) blood sugar, triglycerides, and blood pressure—often occur together. If you have at least three of the five, you have the syndrome, which means an increased risk of diabetes and heart disease.

Most researchers believe that the underlying problem is that insulin no longer works efficiently. The cause: too much waist. Here's how a bulging belly leads to metabolic meltdown...and how to fix it.

Q: *What causes the metabolic syndrome?*

A: The body's inability to effectively process nutrients like fats and sugars. The central problem is that we're eating too much and exercising too little.

The metabolic syndrome raises our risk of type 2 diabetes and heart disease. Although genetics plays a role, it is important to point out that type 2 diabetes was unheard of in young adults under the age of 35 just a generation ago.

Q: *And too many overstuffed fat cells are to blame?*

A: Some researchers believe that insulin resistance is the key problem, while others blame it on the fat cell.

We do know that belly fat generates factors that increase inflammation and the risk of heart disease. Fat cells also release factors that can drive up blood pressure by reducing the ability of the blood vessel lining to relax. And fat cells produce proteins that increase insulin resistance.

Q: *What is insulin resistance?*

A: Insulin is a hormone that allows glucose, or blood sugar, to be taken up from the bloodstream into muscle, where it's burned for energy, and into fat, where it's stored. Insulin resistance means that the insulin is less efficient at "delivering the goods," so sugar levels rise in the blood.

Q: *And that can cause diabetes?*

A: Yes. It leads to a vicious cycle because the pancreas goes into overdrive to make more insulin to try to lower blood sugar levels. Over time, if you don't lose weight and exercise, your insulin and sugar levels continue to climb until your blood sugar rises above 125, which means you have diabetes.

Q: *Does insulin resistance raise triglycerides?*

A: Yes. Insulin doesn't just admit sugar into cells. It also helps to store free fatty acids in your fat cells. If your insulin is working, it's going to keep fat in fat cells until it is needed to serve as fuel for exercising muscles.

But if you have insulin resistance, the fat comes out of the fat cells. It ends up in the liver, which repackages the free fatty acids as triglycerides. So there's no question that insulin resistance drives that process.

Q: *What are triglycerides?*

A: They're the main fat in foods, and they're also found in the bloodstream. Even though triglycerides are fats, diets high in carbohydrates, especially sugars that contain fructose—like table sugar and high-fructose corn syrup—can raise triglycerides in the blood.

Q: *Do some features of the metabolic syndrome matter more than others?*

A: Some of us think that what's most important is a bigger waist and

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The Metabolic Syndrome

1. Waist size	Women: more than 35-inch waist Men: more than 40-inch waist[1]
2. Triglycerides*	150 or higher
3. HDL ("good") cholesterol*	Women: under 50 Men: under 40
4. Blood pressure	Systolic: 130 or higher *or* Diastolic: 85 or higher
5. Blood sugar*	110 or higher

* Fasting. [1] For some men, a 37- to 39-inch waist can be a risk factor.

Source: National Heart, Lung, and Blood Institute.

You have the metabolic syndrome—a sign of insulin resistance—if you have any three of its five features.