

Metabolic Syndrome

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What is it?

First proposed in 1988, *metabolic syndrome* describes anyone who has several common problems with metabolism at the same time including abdominal obesity, high blood pressure, high blood sugar, and abnormal cholesterol. Together these metabolic abnormalities more strongly predict heart disease, diabetes, stroke and death from all causes than each of them individually. In fact, people with metabolic syndrome are 2-3 times more likely to die of heart disease than normal people. This syndrome is also known as insulin resistance syndrome, dysmetabolic syndrome or syndrome X.

Insulin resistance seems to be the common link in metabolic syndrome. Normally, our bodies use a hormone called *insulin*, which is made in the pancreas, to deliver the sugar we get from food to our muscles and fat cells, where it is used as fuel. In insulin resistance, the body makes plenty of insulin but the tissues don't recognize it so the pancreas keeps making more. Obesity worsens insulin resistance making it difficult for cells to respond to insulin. Soon, the blood is packed with too much insulin and too much sugar. That causes inflammation and damages the lining of the arteries and other parts of the body. Over time, insulin resistance can develop into pre-diabetes and eventually full-blown Type 2 diabetes. Metabolic syndrome represents a clustering of risk factors for heart disease linked through their association with insulin resistance.

What causes it?

No one knows for sure. But we do know that there are both genetic factors and lifestyle choices which contribute to the development of metabolic syndrome. Mostly it happens when you don't get enough exercise and you eat too many calories and too much fat.

Who gets it?

An estimated 47 million or 24% of US adults have metabolic syndrome. Some experts predict that at least half of persons over age 60 would meet the criteria for this syndrome. In addition, 4.2% of US adolescents aged 12-19 years have the disorder. In particular, anyone with a family history of type 2 diabetes who is

overweight and inactive should be evaluated for the metabolic abnormalities associated with metabolic syndrome. The ethnic group with the highest overall rate of metabolic syndrome is Mexican Americans.

What are the symptoms?

There are no immediate physical symptoms, but rather a set of easily measured criteria which identify the vast majority of those with metabolic syndrome. In particular, the strongest predictor is waist circumference measured at the end of normal expiration with a tape measure held parallel to the floor at the top of the hip bone. A formal diagnosis of metabolic syndrome is made if a person has **three** or more of the following five conditions:

Diagnostic criteria for metabolic syndrome

- Abdominal girth (waistline)
 - Men \geq 40 inches (102 cm)
 - Women \geq 35 inches (88 cm)
- Fasting HDL (good) cholesterol
 - Men $<$ 40 mg/dl
 - Women $<$ 50 mg/dl
- Fasting triglycerides $>$ 150 mg/dl
- Fasting glucose (sugar) $>$ 110 mg/dl
- Blood pressure \geq 130/85

How do you prevent it?

Diet and exercise are the keys. A Finnish study found that people who did moderate aerobic-type exercise for 2½ hours per week and lost 7% of body weight cut their risk of developing diabetes by 58%! This was twice as effective as any medication currently available – without side effects.

In addition, recent studies contribute to growing evidence that a Mediterranean style diet – rich in fruits, vegetables, grains, and olive oil – is associated with reductions in metabolic syndrome and heart disease.

Goals for daily intake of calories are carbohydrates 50-55%, protein 15% and fats <35% of which saturated fats <7%, polyunsaturated fats <10%, and monounsaturated fats <20%.

How much exercise and what kind of exercise you should do depends on you fitness level now. If you don't already exercise, start by walking for five minutes every day. It may be hard at first, so go slowly. Once you are walking regularly, you should slowly increase how fast and how far you walk. Eventually you should walk for 30-60 minutes at least five days a week. If you already exercise this much, consider adding resistance exercises to build muscle strength. A good exercise program includes three parts: warm-up and stretching, cardiovascular exercise (such as walking and biking), and strength training (like weight lifting).

If you smoke, stop. Studies show smoking promotes insulin resistance. Also, alcohol should be limited to no more than one drink a day for women or two drinks for men.

Can it be treated?

The recommended first steps for treatment of metabolic syndrome are weight loss, diet and increased physical activity. The importance of such lifestyle changes can not be overemphasized. The ideal diet is a low calorie, low cholesterol diet with plenty of fruits, vegetables, and fiber. If reduced weight and increased activity are not successful, medications can be added to help manage the individual metabolic abnormalities and reduce risk of complications. The effects are additive to lifestyle changes.

- **Weight loss** - Although a few people with metabolic syndrome are of normal weight, most are overweight or obese and weight loss is the primary goal. Obesity has been identified as the best predictor of metabolic syndrome and is thought to precede the development of insulin resistance. Obesity in Idaho has doubled in the last 10 years. Trimming even 10-15 pounds can reduce the percentage of body weight due to fat and restore your body's ability to recognize insulin.

- **Physical activity**: Exercise generally improves circulation, increases HDL cholesterol and burns calories. Exercise also leads to more muscle and less fat which reduces insulin resistance and helps your body burn calories more efficiently.

The physical activity needed for improved health is manageable for almost anyone: 30 minutes of moderate exercise 5 days a week. The activity can be broken up during the day as fits the person's schedule.

- **HDL cholesterol**: For every 1% decrease in HDL there is a 2% increase in heart disease risk. These protective fractions can be increased mainly in 3 ways. First is by stopping smoking. Secondly by increasing exercise. Third is by reducing weight.

- **Triglycerides**: These are the plain fats found in the blood. Strategies to decrease triglycerides include limiting fat, alcohol, carbohydrates, and dietary sugar. Replace refined carbohydrates with whole grains, legumes, and unsaturated fats (nuts, olive oil, and canola oil). Regular physical activity also helps to normalize levels.

- **Blood glucose**: Persons with impaired fasting glucose (blood sugar >110) are considered as having pre-diabetes. They have additional insulin resistance and increased risk of progression to diabetes.

- **Blood pressure**: This is a very important factor in the complications of metabolic syndrome. Dietary changes that can lower blood pressure include reducing red meat and butter plus increasing fruits, vegetables and low fat dairy products.

- **Clotting disorder**: People with metabolic syndrome have several disorders of coagulation that make it easier to form blood clots within blood vessels. These clots are often a factor in developing heart attacks. People with metabolic syndrome are often placed on aspirin to help prevent such clotting events.

Are there complications?

Insulin resistance is linked to many harmful changes to the body, including: 1. Damage to the lining of coronary and other arteries, a key step toward the development of heart disease or stroke. 2. Changes in the kidneys' ability to remove salt, leading to high blood pressure, heart disease and stroke. 3. An increase in triglyceride levels, resulting in an increase risk of developing heart disease. 4. An increased risk of blood clot formation, which can block arteries and cause heart attacks and strokes. 5. A slowing of insulin production, which can signal the start of type 2 diabetes, a disease that can increase your risk for a heart attack or stroke and may damage your eyes, nerves, or kidneys.

In summary

- Metabolic syndrome represents a clustering of risk factors for heart disease.
- The key to prevention is weight loss and increased physical activity
- For more information, contact the American Diabetes Association at (800) DIABETES or (800) 342-2383 or www.diabetes.org