

Heart Disease and Metabolic Syndrome

Insulin Resistance can be an underlying cause of **Metabolic Syndrome**, which, if neglected, may lead to **coronary artery disease**, resulting in a stroke.

People suffering from Metabolic Syndrome, also known as Syndrome X, often have elevated cholesterol levels, high blood pressure, obesity and Insulin Resistance, which all damage the cardiovascular system. Insulin Resistance is an underlying cause of obesity, which, in turn, can be a key factor in the development of Metabolic Syndrome.

Reversing Insulin Resistance can be a crucial factor in **heart disease** prevention in other ways because it also increases a person's risk of developing Type 2 Diabetes, which sharply increases the likelihood of Cardiovascular Disease.

Coronary heart disease (CHD) is a broad term that describes any disorder that can impact the functioning of the heart muscle itself or the whole cardiovascular system. Conditions that contribute to **heart disease** include high blood pressure, arteriosclerosis (the build-up of calcium deposits on the artery wall) and atherosclerosis (the build-up of fatty deposits on the artery wall).

The causes of heart disease include: elevated LDL "bad" cholesterol, low HDL "good" cholesterol, obesity, elevated blood pressure, [Type 2 Diabetes](#), cigarette smoking and lack of physical activity. Many of these are underlying conditions found in both Insulin Resistance and Metabolic Syndrome.

Chronic high levels of glucose and insulin are classic symptoms of Insulin Resistance and Metabolic Syndrome. One of the primary risk factors for atherosclerosis, a form of hardening of the arteries, is an elevated level of triglycerides. The biggest risk factor for increasing the production of triglycerides is the rate of your insulin secretion.

"... metabolic syndrome is as serious a condition among children as it is among adults and preventive steps should be taken immediately in children who exhibit this condition to ward off premature heart disease."

[Prevention of Heart Disease Should Begin in Childhood, Diabetes Care, American Diabetes Association](#)

Insulin is produced in your pancreas and released into the circulatory system where it is the key to the absorption of glucose by your cells. If your cells resist insulin, then both insulin and glucose build up in your blood. Excess insulin leads to weight gain and high blood pressure – both precursors to [Cardiovascular Disease](#). As insulin comes in contact with the interior wall of the arteries, it damages the tissue, causing the initial injury that produces plaque. Therefore, having Insulin Resistance and Metabolic Syndrome directly cause changes in the blood lipids and overall cardiovascular health that contribute to the formation of heart disease.

Recommendations for reducing heart disease risk are the same as those for reducing Insulin Resistance, namely decreasing insulin, balancing cholesterol and lowering blood pressure. It all involves managing Metabolic Syndrome to minimize current symptoms and an attempt to delay or prevent worsening of the underlying conditions that lead to heart disease. This can be done through careful food choices, including a low cholesterol diet, exercise and weight loss in overweight individuals. But a multi-faceted approach is clearly necessary to address all the symptoms of these conditions.

Cardiovascular Disease and Metabolic Syndrome (Syndrome X)

Metabolic Syndrome symptoms significantly increase the chances of developing **Cardiovascular Disease**, which, if neglected, can lead to a heart attack or stroke.

Having three or more symptoms of **Metabolic Syndrome** raises the risk of coronary death, according to a recent study in *Circulation: Journal of the American Heart Association* (1). Even one or two symptoms of Metabolic Syndrome increases the danger of dying from **Cardiovascular Disease**.

Also known as Syndrome X, Metabolic Syndrome is characterized by a group of risk factors for damage to the cardiovascular system. They include excessive fat tissue in and around the abdomen, blood-fat disorders, the imbalance of blood glucose and insulin called Insulin Resistance and hypertension (high blood pressure). An underlying cause of Metabolic Syndrome can be Insulin Resistance-related obesity caused by poor diet and lack of regular exercise.

Researchers compared the risk of death among men and women with a cluster of abnormalities symptomatic of Metabolic Syndrome to the risk faced by patients with existing Cardiovascular Disease and [Pre- and Type 2 Diabetes](#) and people without Metabolic Syndrome, Cardiovascular Disease or Diabetes.

"It is particularly interesting that patients with even one or two Metabolic Syndrome traits, or those with Metabolic Syndrome but without Diabetes, were at increased risk for death from coronary heart disease and cardiovascular diseases," said Nathan D. Wong, professor and director of the Heart Disease Prevention Program, Division of Cardiology at the University of California.

Researchers reviewed data from 6,255 patients who participated in the second National Health and Nutrition Examination Survey (NHANES 2) from 1976 through 1980 and whose causes of death were documented. They ranged in age from 30-75 and 54% were women.

In this study, a person was diagnosed with Metabolic Syndrome if three or more of these characteristics were found:

- A BMI (Body Mass Index) of 30 kg/m² or greater, which is classed as obesity
- HDL "good" cholesterol less than 40 mg/dL if male or less than 50 mg/dL if female
- Triglycerides greater than or equal to 150 mg/dL if fasting or greater than or equal to 400 mg/dL if not fasting
- Blood pressure greater than or equal to 130/85 mmHg or if the patient was on anti-hypertension (high blood pressure) medication
- Glucose greater than or equal to 100 mg/dL if fasting or two-hour post-load glucose greater than or equal to 140 mg/dL

Overall, 26% of participants had Metabolic Syndrome and 19.8% had pre-existing Cardiovascular Disease, meaning they reported that a physician had diagnosed them as having coronary heart disease, heart failure, stroke or other cardiac disease. The remaining 54% did not have Metabolic Syndrome, Pre- or Type 2 Diabetes or Cardiovascular Disease.

Compared to people with no Metabolic Syndrome factors, the risk of death from coronary heart disease or forms of Cardiovascular Disease was twice as high for those with one to two [symptoms of Metabolic Syndrome](#) and 3.5 times higher for people with full-blown Metabolic Syndrome (three or more symptoms).

And in contrast to those participants with neither Metabolic Syndrome, Pre- or Type 2 Diabetes nor Cardiovascular Disease, patients with Metabolic Syndrome but no Diabetes had a 65% greater risk of death from coronary heart disease. Those with Diabetes had a 2.9 times greater risk. Risk of death for those with pre-existing Cardiovascular Disease alone were 4.2 times higher and for participants with combined Diabetes and Cardiovascular Disease the figure was 6.5 times

higher.

"The study emphasizes the importance of close risk-factor monitoring and management, particularly blood pressure and dyslipidemia (abnormal levels of blood fats), which are common in those with Metabolic Syndrome," said Dr. Wong.

He added that the findings showing the highest death risk among those with both Diabetes and pre-existing Cardiovascular Disease support the recently released revision of the National Cholesterol Education Program Adult Treatment Panel III guidelines for lipid management. The guidelines have placed these people in the "very high risk" category, warranting aggressive risk-factor intervention.

"We recommend physicians provide adequate resources for their patients with Metabolic Syndrome to improve compliance to diet and exercise regimens," added Dr Wong. "Many physicians who may not have the time to counsel a patient for an hour on diet or exercise do not refer to a registered dietitian or exercise specialist when they should."

"More attention to the medical management of elevated risk factors is essential to prevent Metabolic Syndrome, Diabetes and their complications, " he added.

Insulin Resistance-linked obesity is an underlying cause of Metabolic Syndrome. Insulin is produced in the pancreas and released into the circulatory system where it is crucial to the absorption of glucose by the body's cells. If the cells resist insulin, then both insulin and glucose build up in your blood. Excess insulin leads to weight gain and high blood pressure — both precursors to Metabolic Syndrome and Cardiovascular Disease.

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