

Metabolic Syndrome

What is metabolic syndrome??

‘Metabolic syndrome’, ‘syndrome X’, or what is called ‘Insulin resistance syndrome’, is a constellation of multiple risk factors; which include obesity, physical inactivity, and genetic factors.

Metabolic syndrome is closely associated with insulin resistance that places subjects at risk for Diabetes Mellitus (DM) and cardiovascular events.

Diagnosing metabolic syndrome:

Metabolic syndrome is defined as the presence of three or more of the following risk factors

- FPG (Fasting Plasma Glucose) ≥ 110 mg/dl (> 6.1 mmol/L)
- WC (Waist Circumference) ≥ 102 cm (40 inches) for men, and >88 cm (35inches) for women.
- TG (Triglycerides) ≥ 150 mg/dl (>1.7 mmol/L)
- HDL (High Density Lipoprotein) ≤ 40 mg/dl (1.0 mmol/L) for men and ≤ 50 mg/dl (1.16 mmol/L) for women.
- BP (Blood Pressure) $\geq 130/85$ mmHg (or treated hypertension).
- Prothrombotic state (e.g., high fibrinogen or plasminogen activator inhibitor–1 in the blood)
- Proinflammatory state (e.g., elevated C-reactive protein in the blood)

American Heart Association (AHA) Recommendation for Managing the

Metabolic Syndrome:

- **Weight loss** to achieve a desirable weight (BMI less than 25 kg/m^2). This can be achieved by limiting your intake of saturated fats, increase you physical activity, weight loss medication and surgical interventions can be done under your Doctor supervision.

- **Increased physical activity**, a regular exercise program including aerobic activity is an essential component in the management of metabolic syndrome. Aerobic exercise, such as walking or swimming in 20 to 30 minutes intervals three to four times per week has been shown to increase whole body insulin sensitivity in both diabetic and non-diabetic patients.
- **Healthy eating habits** a diet rich with fruits, vegetables and fibers, low with salt and fat (saturated fat and cholesterol) is recommended. Low calorie diets can reduce insulin resistance even before weight loss has occurred.
 - Now there is a trend toward the use of Mediterranean diet a one that is rich in “good” fats (olive oil) and contains a reasonable amount of carbohydrates and proteins (such as from fish and chicken).

The Mediterranean diet is palatable and easily sustained. In addition, recent studies have shown that when compared to a low fat diet, people on the Mediterranean diet have a greater decrease in body weight, and also had greater improvements in blood pressure, cholesterol levels, and other markers of heart disease -- all of which are important in evaluating and treating metabolic syndrome

- **Supplements:**

Plant Sterols, Stanols, Soy protein and Isoflavones, these are naturally present in small quantities in many fruits, vegetables, nuts, seeds, cereals, legumes and vegetable oils. They have been found to inhibit the absorption of cholesterol in small intestine by 50% and decrease LDL-C by 14%.

Omega-3, have significant cardio-protective effects via multiple mechanisms that relate to arrhythmic actions, thrombosis, growth of atherosclerotic plaque, lipogenesis(decrease TG and total cholesterol), and hypertension. FDA recommended that consumers not to exceed more than a total of 3 grams per day of Omega-3 (EPA and DHA omega-3 fatty acids).

Chromium, improves insulin sensitivity, and reduces elevated blood sugar and glycosylated hemoglobin levels. It also shortens the QTc interval duration in patients with DM type 2, (QTc is a predictor of future stroke and cardiovascular morbidity and mortality).

Thus in the majority of studies, supplementation with 200-1000 mcg of chromium has resulted in improvements in metabolic syndrome risk factors.