The number of people at risk of developing cardiovascular disease (CVD) and type 2 diabetes mellitus (T2DM) has risen dramatically throughout the world. This patient guide is based on clinical guidelines written by an expert group of doctors from The Endocrine Society that offer recommendations to prevent CVD and T2DM in people at metabolic risk. Metabolism is a complex chemical process that keeps the body’s cells healthy and working properly. Those at metabolic risk have several factors—high blood pressure, lipid abnormalities, high blood sugar, and excess body weight, particularly at the waistline—that cause them to be more likely to develop CVD or T2DM.

Who is at metabolic risk?

People at metabolic risk can be identified with simple measurement and blood tests. A person who is at metabolic risk typically has three or more of the following signs:

• Large amount of abdominal fat—generally speaking, this means a waist measurement more than 40 inches in men and more than 35 inches in women
• High triglycerides (levels of fat in the blood)—150 mg/dL or higher, or currently taking medication to lower triglycerides
• Low levels of high-density lipoprotein (HDL or “good”) cholesterol—less than 40 mg/dL in men or less than 50 mg/dL in women, or currently taking medication to increase HDL
• High blood pressure—greater than or equal 130 mm Hg systolic, or greater than or equal 85 mm Hg diastolic, or taking blood pressure medication
• High blood glucose (blood sugar)—fasting glucose of greater than or equal 100 mg/dL, or currently taking medication to lower glucose levels

Focusing on these signs should not take attention away from other known CVD risk factors such as high levels of low-density lipoprotein (LDL or “bad”) cholesterol and family history.

Who should be tested for metabolic risk?

Many people who have the signs described above feel healthy and have no symptoms of ill health. Still, they are at risk of developing life-threatening diseases like CVD and T2DM in the future. Therefore, the guidelines recommend that health care providers test for the main components of metabolic risk at routine visits at least every 3 years if you have at least one risk factor. If you have three or more signs, you need to be tested more often.

The guidelines suggest testing if you have previously been diagnosed with prediabetes. Prediabetes is a condition in which the fasting blood sugar is higher than normal but not high enough for a diagnosis of diabetes, i.e., between 100 and 125 mg/dl. Because prediabetes can lead to diabetes, you should be tested for T2DM every 1 or 2 years.

For patients identified as having metabolic risk, the guidelines recommend that physicians evaluate their 10-year risk for either coronary heart disease (CHD) or CVD. Doctors who decide to do this risk assessment will collect clinical information such as age, use of cigarettes, blood pressure, and blood lipid levels and enter the information into a formula; then specific treatment recommendations are based on whether you are at high (over 20%), moderately high (10–20%), or moderate (less than 10%) risk for having a major CVD event in the next 10 years (or sooner).
What treatment is recommended to prevent atherosclerotic CVD?

Atherosclerosis is the underlying cause of CVD, especially stroke and CHD. Atherosclerotic CVD results when you have a build-up of cholesterol plaque in your arteries. LDL cholesterol is a major cause of the problem. For this reason, the guidelines recommend therapy aimed at lowering LDL cholesterol in patients at metabolic risk to reduce risk for CVD. The intensity of the LDL cholesterol-lowering therapy should be adjusted according to your 10-year risk for CVD.

LDL cholesterol goals
- High-risk patients: less than 100 mg/dL
- Moderately high-risk patients: less than 130 mg/dL
- Moderate-risk patients: less than 130 mg/dL

Depending on your level of risk, several treatment options are available. If you are at moderate risk for CVD, lifestyle therapies (a meal plan and weight reduction) alone may lower LDL cholesterol enough to reduce your long-term risk. Suggested dietary changes to lower LDL include:
  - Reducing saturated fat to less than 7% of total calories
  - Reducing trans fats to less than 1% of total calories
  - Reducing dietary cholesterol to less than 200 mg/day
  - Eating more fresh fruits, vegetables, whole grains, and fiber
  - Reducing body weight by 7% to 10%

Increased physical activity is also recommended along with other lifestyle therapies because studies suggest it will reduce cardiovascular risk. Medications to lower LDL cholesterol may be added to lifestyle therapy for patients in the higher risk categories.

The guidelines recommend that blood pressure be treated to a target of less than 140/90 mm Hg (or less than 130/80 in individuals with diabetes or chronic kidney disease). If weight loss or lifestyle modifications are not successful, then medications to lower blood pressure should be used to reach the target.

If you are at metabolic risk, are over age 40, and your 10-year risk is greater than 10%, the guidelines recommend that, with your doctor’s approval, you take low-dose aspirin (75–162 mg/day) for primary prevention of CVD.

What treatment is recommended to prevent Type 2 Diabetes Mellitus (T2DM)?

High blood sugar is the underlying cause of T2DM. Too much sugar in the blood can cause serious health complications including CVD, stroke, kidney disease, and blindness. For primary prevention of T2DM (and lowering blood sugar), patients at metabolic risk should be started on a weight reduction program (or weight maintenance if not overweight or obese) through a balance of physical activity and caloric intake rather than medications.

Lifestyle therapies appear to be just as effective as medications in preventing T2DM, whose potential long-term risks are still unknown. Specifically, for individuals at metabolic risk who carry weight around their mid-section, the guidelines recommend that body weight be reduced by 5% to 10% during the first year of therapy. Patients at metabolic risk need to participate in regular moderate-intensity physical activity. This activity should last at least 30 minutes, but preferably 45–60 minutes, at least 5 days a week. It could include brisk walking or more strenuous activity.

The guidelines recommend that everyone at metabolic risk follow a diet that is low in total and saturated fat, is very low in trans fats, and includes adequate fiber. They suggest that saturated fat be less than 7% of total calories and dietary cholesterol be less than 200 mg/day.

What can you do to help your treatment process?

You and your doctor should be partners in your care. Ask whether you are at metabolic risk of developing CVD or T2DM. If so, remember that weight loss and physical activity are the best ways to manage the clinical signs of metabolic risk. Follow your doctor’s advice for treatment and see him or her regularly for testing and monitoring of your condition. It is important to make needed changes before serious complications develop.