

## Do You Have Metabolic Syndrome? What Can You Do About it

Metabolic Syndrome is a group of abnormal metabolic changes that have become more common as Americans gain weight during the past 15 years. These abnormalities include an extensive collection of fat in and around the abdomen, high blood pressure, and diabetes, high cholesterol, increased risk of heart disease, and elevated triglycerides (fats) in the blood.

All of these abnormalities result from the excess food we consume turning to fat which is first stored around the belly. After accumulating on the outside of the belly, that common "beer belly" fat is stored inside the abdomen around the internal organs. Figure 2.1 illustrates a whole family with metabolic syndrome:

**Figure 2.1**

*This whole family in the UK has the metabolic syndrome*



These new fat cells synthesize new chemicals not present before the weight gain. The chemicals leave the fat cells and travel via the bloodstream all over the body, raising blood pressure and injuring the heart and blood vessels. The result is hypertension; diabetes, heart attacks, and strokes—the signs of Metabolic Syndrome.

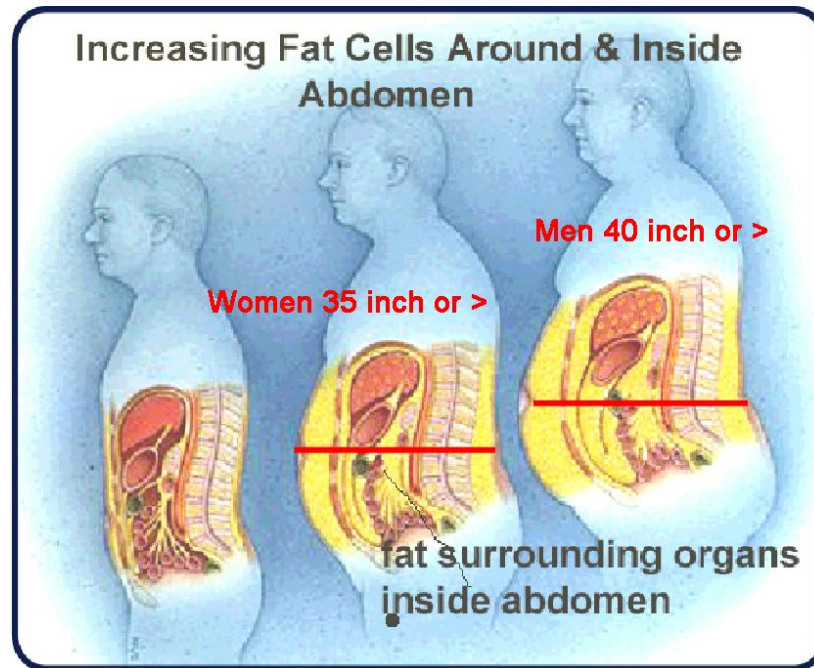
. Metabolic Syndrome affects most patients who have gained 30 pounds or more. They are typically unaware of the problem when they initially enter my office. They are surprised to learn that the fat cells around their belly (often a subject of much discussion) convert into an active brand new endocrine organ like the thyroid or adrenal gland, producing a slew of harmful new chemicals that are released into the bloodstream.

The mark of Metabolic Syndrome—is too much fat around the abdomen. It is the cause of the disease. You do not need an expensive blood test, an MRI, or to see a doctor to confirm that you have it. **If you are a woman with a waistline of 35 inches or more or men with a waistline of 40 inches or more—you are well on your way to Metabolic Syndrome.**

In figure 2.2 increasing fat cells are deposited around intra abdominal organ the hallmark of the metabolic syndrome.

**Figure 2.2**

*Fat cells surround the intra abdominal organs in metabolic syndrome.*



The condition causes many medical problems, such as high blood pressure, heart attacks and strokes.

According to current data, more than 35% of the population today has Metabolic Syndrome. Some doctors believe that if obesity continues to increase at the current rate, 85 %—92 % of Americans will have Metabolic Syndrome by 2035.

### **How is Metabolic Syndrome Discovered?**

Since the first signs of metabolic Syndrome are mostly chemical changes in the blood, the first symptoms you might notice are delayed for years. Other than the warning of unusual weight gain and a protruding belly, there are no signs.

*Metabolic Syndrome presents a fivefold increased risk of dying of cardiac disease in the ten years after diagnosis and a tenfold risk of developing diabetes.*

### **What Causes the Metabolic Changes in the Blood in People with Metabolic Syndrome?**

When we consume more food than is needed for energy, excess food is converted into fat stored in fat cells scattered all over the body. These fat deposits are normal and serve as an energy source when food is limited.

The problem begins when food intake continues to be excess- - above the amount the body recognizes as needed for "normal energy storage." When this happens, excess fat is stored in newly created fat cells around the waist and inside of the abdomen. These new fat cells are different from the older fat cells. These fat cells act like a filter removing chemicals from the bloodstream. At the same time, they release new proteins and chemicals into the bloodstream.

## Enlarging Fat Cells Effect on Insulin

The enlarging fat cells deactivate insulin and cause a condition known as insulin resistance. The body makes insulin, but the fat cells render the insulin less effective in lowering blood sugar. This causes the pancreas to work harder and produce more insulin to control the blood sugar. When the pancreas cannot keep up with the increasing demand for more and more insulin, the fasting blood sugar rises, and the person is said to have diabetes.

Diabetes in obese people is associated with **more** and **not less insulin**. The defect is that the enlarging abdominal fat cells have rendered the insulin less active and effective in controlling blood sugar. This explains the relationship between enlarging fat cells due to excess food ingestion and the development of overt diabetes.

Simultaneous with the effect of fat cells and circulating insulin is the recently observed fact that the enlarged fat cells inside and outside of the abdomen are associated with producing at least 90 new chemicals including several hormones and multiple proteins that were **not** present before the excess weight gain. These substances act as chemical messengers between the fat cells and the rest of the body. They raise triglyceride levels, blood pressure, and blood sugar, cause blood clots and polycystic ovaries, as well as heart attacks and strokes.

Here are some of the key criteria (Figure 2.3) for Metabolic Syndrome. Note at first glance, the excess weight in an individual with metabolic Syndrome is concentrated around the waist. This is called central obesity. It is the hallmark of Metabolic Syndrome. All of the other criteria are metabolic abnormalities seen in the blood measurements.

### Figure 2.3

*Metabolic criteria for the Metabolic Syndrome*



**Five Criteria to Determine If You Have Metabolic Syndrome:**

**1. Waist: 40 inches or more for men; 35 inches or more for women:**

Forty inches and 35 inches are the average measurements. To be more accurate, you need to relate waist obesity with height. Here are the measurements based on size for both genders: Waist is measured at the top of the iliac crest using the NIH criteria.

The waist circumference is the most reliable measurement for determination of the Metabolic Syndrome. (Figure 2.4)

*Waist Circumference Helps Define Metabolic Syndrome*

Waist Measurement Chart Women (in feet and inches)			
Height	Ideal	Overweight	Obese
5'-1"	24"	28.4"-31.5"	>31.5"
5'-2"	24.5"	29.1"-32.2"	>32.2"
5'-3"	25"	29.9"-33.0"	>33.0"
5'-4"	26"	30.7"-33.8"	>33.8"
5'-5"	26"	31.5"-34.6"	>34.6"
5'-6"	26.5"	32.3"-35.4"	>35.4"
5'-7"	27"	33.1"-36.2"	>36.2"
5'-10"	27.5"	35.5"-38.6"	>38.6"
6'-0"	28"	37.1"-40.2"	>40.2"

Waist Measurement Chart Men (in feet and inches)			
Height	Ideal	Overweight	Obese
5'-6"	29"	33"-36"	>36"
5'-7"	31"	34"-37"	>37"
5'-8"	31.2"	35"-38"	>38"
5'-9"	31.7"	36"-39"	>39"
5'-10"	32"	37"-40"	>40"
5'-11"	32.6"	38"-41"	>41"
6'-0"	33.1"	39"-42"	>42"
6'-2"	34"	41"-44"	>44"
6'-4"	35"	43"-46"	>46"

**2. Blood pressure of 130/85 mm. Hg. or higher**

**3. Triglyceride level above 150 mg/ml:**

Triglycerides are the fat in the blood. They come from our food and are also produced by the liver and fat cells; as the level of fat increases in the blood, fat and cholesterol deposits are deposited as plaques which narrow the blood supply to arteries around the heart (coronary arteriosclerosis) and in the brain (cerebral arteriosclerosis). This results in angina (chest pain), heart attacks, and strokes.

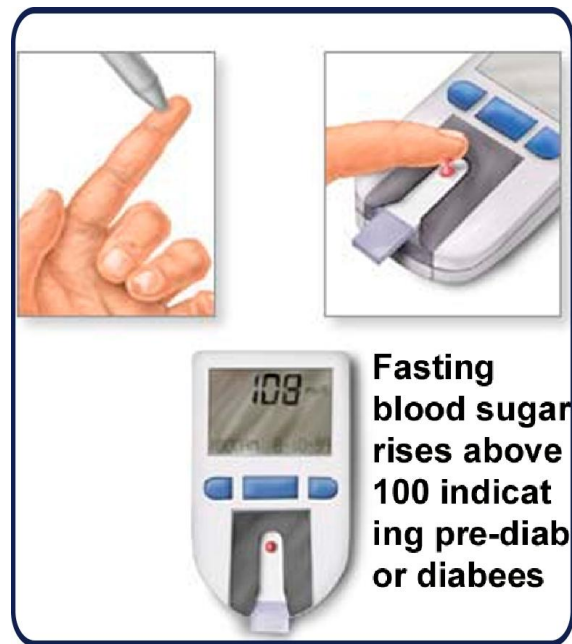
**4. Fasting blood sugar that is greater than 100 mg/ml:**

Normal fasting blood sugar is from 70 to 99 mg%. When blood sugar rises above 100 mg, the pancreas (the organ responsible for insulin production cannot keep up with the rising blood sugar). Although insulin levels are high, it's ineffective in lowering blood sugar.

Diabetes is the result. An elevated HBA1C is a more accurate measurement of average blood sugar over the past three months. Values of 5.7% or above indicate pre-diabetes and values above 6.4% are diabetic. Measurements of blood sugar. (Figure 2.5)

**Figure 2.5**

*Various methods to measure blood sugar*



##### **5. HDL (good cholesterol) less than 50**

Cholesterol is a fatty chemical made in the liver and in the fat cells of overweight people. The two main types are HDL, or high-density cholesterol, or "good cholesterol," and LDL cholesterol, or low-density cholesterol. LDL cholesterol sticks to artery walls and causes plaque build-up. In Metabolic Syndrome, the HDL cholesterol is low, thus preventing the "cleaning" of the blood vessels. The "protective" effect of high HDL is absent in Metabolic Syndrome. A good number for HDL cholesterol is about 70 or 80. Exercise and dietary changes can raise it.

Metabolic Syndrome is also related to genetic factors and excess food intake. Even so, the treatment is weight loss and increased energy output in terms of exercise.