

# Understanding Blood Screening Results

## City of Glasgow Wellness Program

### Educational Article

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Fax to Kathy Radomski (866) 734-3250

#### Blood Glucose

A blood glucose test measures the amount of a type of sugar, called glucose, in your blood. Glucose comes from carbohydrate foods. It is the main source of energy used by the body. Insulin is a hormone that helps your body's cells use the glucose. Insulin is produced in the pancreas and released into the blood when the amount of glucose in the blood rises.

Normally, your blood glucose levels increase slightly after you eat. This increase causes your pancreas to release insulin so that your blood glucose levels do not get too high. Blood glucose levels that remain high over time can damage your eyes, kidneys, nerves, and blood vessels.

Several different types of blood glucose tests are used.

- **Fasting blood sugar (FBS)** measures blood glucose after you have not eaten for at least 8 hours. It is often the first test done to check for prediabetes and diabetes.
- **2-hour postprandial blood sugar** measures blood glucose exactly 2 hours after you start eating a meal.
- **Random blood sugar (RBS)** measures blood glucose regardless of when you last ate. Several random measurements may be taken throughout the day. Random testing is useful because glucose levels in healthy people do not vary widely throughout the day. Blood glucose levels that vary widely may mean a problem. This test is also called a casual blood glucose test.
- **Oral glucose tolerance test** is used to diagnose prediabetes and diabetes. An oral glucose tolerance test is a series of blood glucose measurements taken after you drink a sweet liquid that contains glucose. This test is commonly used to diagnose diabetes that occurs during pregnancy (gestational diabetes). For more information, see the medical test Oral Glucose Tolerance Test. This test is not commonly used to diagnose diabetes in a person who is not pregnant.

#### Why It Is Done

Blood glucose tests are done to:

- Check for diabetes.
- Monitor treatment of diabetes.
- Check for diabetes that occurs during pregnancy (gestational diabetes).
- Determine if an abnormally low blood sugar level (hypoglycemia) is present. A test to measure blood levels of insulin and a protein called C-peptide may be done along with a blood glucose test to determine the cause of hypoglycemia. For more information, see the medical test C-Peptide.

#### Understanding Blood Sugar Levels

The average blood sugar level varies depending on what type of test is being performed. Two hours after a meal, normal levels should be between 70 and 145 milligrams per deciliter (mg/dL). A fasting blood sugar level should be lower, averaging between 70 and 90 mg/dL. Tests done at random times should stay between 70 and 125 mg/dL.

Experts agree that when the blood glucose levels are at 200 mg/dL and above it is a sign of diabetes. This means that insulin is not breaking down the glucose and the body is not absorbing it quickly enough. Further testing may be required however, as other factors such as stress or stroke can increase these numbers.

Having an elevated blood sugar level often accompanies other symptoms of diabetes, such as extreme hunger and thirst.

### **Prediabetes (impaired glucose tolerance)**

- Prediabetes is a condition in which a person's blood sugar (glucose) level is above normal but below a level that indicates diabetes. Prediabetes has no symptoms and can only be diagnosed with a blood glucose test.
- Prediabetes may be called impaired glucose tolerance or impaired fasting glucose, depending on the test used to diagnose it.
- People who are age 45 or older and overweight are at risk for prediabetes. Also, people who are younger than 45 and overweight, and who have one or more other things that put them at risk for type 2 diabetes-such as a family history of diabetes; high blood pressure; high cholesterol; African-American, Asian-American, Hispanic, Native American, or Pacific Islander ethnicity; and/or a history of gestational diabetes (women)-are at risk for prediabetes.
- Some people with prediabetes go on to develop type 2 diabetes later in life, and recent studies show that prediabetes increases the risk of heart disease. People with prediabetes may be able to prevent type 2 diabetes by losing weight, eating a healthy diet, and exercising regularly.

### **Cholesterol and Heart Disease**

When too much cholesterol is present, plaque (a thick, hard deposit) may form in the body's arteries narrowing the space for blood to flow to the heart. Over time, this buildup causes atherosclerosis (hardening of the arteries) which can lead to heart disease.

When not enough oxygen-carrying blood reaches the heart chest pain -- called angina -- can result. If the blood supply to a portion of the heart is completely cut off by total blockage of a coronary artery, the result is a heart attack. This is usually due to a sudden closure from a blood clot forming on top of a previous narrowing.

### **Types of Cholesterol**

Cholesterol travels through the blood attached to a protein -- this cholesterol-protein package is called a lipoprotein. Lipoproteins are classified as high density, low density, or very low density, depending on how much protein there is in relation to fat.

- **Low density lipoproteins (LDL):** LDL, also called "bad" cholesterol, can cause buildup of plaque on the walls of arteries. The more LDL there is in the blood, the greater the risk of heart disease.
- **High density lipoproteins (HDL):** HDL, also called "good" cholesterol, helps the body get rid of bad cholesterol in the blood. The higher the level of HDL cholesterol, the better. If your levels of HDL are low, your risk of heart disease increases.
- **Very low density lipoproteins (VLDL):** VLDL is similar to LDL cholesterol in that it contains mostly fat and not much protein.
- **Triglycerides:** Triglycerides are another type of fat that is carried in the blood by very low density lipoproteins. Excess calories, alcohol, or sugar in the body are converted into triglycerides and stored in fat cells throughout the body.

### **What Factors Affect Cholesterol Levels?**

A variety of factors can affect your cholesterol levels. They include:

- **Diet.** Saturated fat and cholesterol in the food you eat increase cholesterol levels. Try to reduce the amount of saturated fat and cholesterol in your diet.
- **Weight.** In addition to being a risk factor for heart disease, being overweight can also increase your cholesterol. Losing weight can help lower your LDL and total cholesterol levels, as well as increase HDL cholesterol.
- **Exercise.** Regular exercise can lower LDL cholesterol and raise HDL cholesterol. You should try to be physically active for 30 minutes on most days.
- **Age and Gender.** As we get older, cholesterol levels rise. Before menopause, women tend to have lower total cholesterol levels than men of the same age. After menopause, however, women's LDL levels tend to rise.

- **Diabetes.** Poorly controlled diabetes increases cholesterol levels. With improvements in control, cholesterol levels can fall.
- **Heredity.** Your genes partly determine how much cholesterol your body makes. High blood cholesterol can run in families.
- **Other causes.** Certain medications and medical conditions can cause high cholesterol.

### How Can I Lower My Cholesterol and Risk of Heart Disease?

A few simple changes can help lower your cholesterol and risk for heart disease:

- **Eat low-cholesterol foods.** The American Heart Association recommends that you limit your average daily cholesterol intake to less than 300 milligrams. If you have heart disease, limit your daily intake to less than 200 milligrams. People can significantly lower their dietary cholesterol intake by keeping their dietary intake of saturated fats low and by avoiding foods that are high in saturated fat and that contain substantial amounts of dietary cholesterol.
- **Quit smoking.** Smoking lowers HDL ("good") cholesterol levels. This trend can be reversed if you quit smoking.
- **Exercise.** Exercise increases HDL cholesterol in some people. Even moderate-intensity activities, if done daily, can help control weight, diabetes, and high blood pressure -- all risk factors for heart disease.
- **Take medication as prescribed by your doctor.** Sometimes making changes to your diet and increasing exercise is not enough to bring your cholesterol down. You may also need to take a cholesterol-lowering drug.

### Understanding Cholesterol Numbers

Cholesterol levels should be measured at least once every five years by everyone over the age of 20. The screening test that is usually performed is a blood test called a lipoprotein profile. Experts recommend that men aged 35 and older and women age 45 and older be routinely screened for lipid disorders. Results of your blood test will come in the forms of numbers. Here is how to interpret your cholesterol numbers:

#### LDL Cholesterol

LDL cholesterol can build up on the walls of your arteries and increase your chances of getting heart disease. That is why LDL cholesterol is referred to as "bad" cholesterol. The lower your LDL cholesterol number, the better it is for your health. The table below explains what the numbers mean.

LDL Cholesterol	LDL-Cholesterol Category
Less than 100	Optimal
100 - 129	Near optimal/above optimal
130 - 159	Borderline high
160 - 189	High
190 and above	Very high

If you have heart disease or blood vessel disease, some experts recommend that you should try to get your LDL cholesterol below 70. For people with diabetes or other multiple risk factors for heart disease, the treatment goal is to reach an LDL of less than 100.

#### HDL Cholesterol

When it comes to HDL cholesterol -- "good" cholesterol -- the higher the number, the better it is for your health. This is because HDL cholesterol protects against heart disease by taking the "bad" cholesterol out

of your blood and keeping it from building up in your arteries. The table below explains what the numbers mean.

<b>HDL Cholesterol</b>	<b>HDL-Cholesterol Category</b>
60 and above	High; Optimal; helps to lower risk of heart disease
Less than 40 in men and less than 50 in women	Low; considered a risk factor for heart disease

### **Triglycerides**

Triglycerides are the chemical form in which most fat exists in food and the body. A high triglyceride level has been linked to the occurrence of coronary artery disease in some people. Here's the breakdown.

<b>Triglycerides</b>	<b>Triglyceride Category</b>
Less than 150	Normal
150 - 199	Borderline high
200 - 499	High
500 or higher	Very high

### **Total Cholesterol**

Your total blood cholesterol is a measure of LDL cholesterol, HDL cholesterol, and other lipid components. Doctors recommend total cholesterol levels below 200

<b>Total Cholesterol</b>	<b>Category</b>
Less than 200	Desirable
200 - 239	Borderline High
240 and above	High

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**QUIZ (Worth 1 Wellness Point)**

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NAME: \_\_\_\_\_

**1. What are 3 risk factors for Prediabetes?**

a.

b.

c.

**2. What is atherosclerosis?**

**3. What are two lifestyle changes that can lower your cholesterol and associated risk of Heart Disease?**

a.

b.

**4. List the “normal” or “desirable” levels for each biometric**

a. Total Cholesterol: \_\_\_\_\_

b. Triglycerides: \_\_\_\_\_

c. HDL: \_\_\_\_\_

d. LDL; \_\_\_\_\_

e. Blood Glucose: \_\_\_\_\_

**5. When did you last have your Cholesterol levels checked?**