

The Connection Between Diabetes and Heart Disease

Diabetes, high cholesterol (hyperlipidemia), high blood pressure (hypertension), and obesity all can lead to an increased occurrence of coronary artery disease (CAD). Eighty percent of patients with diabetes are obese. Obesity also contributes to high levels of cholesterol for people with diabetes.

People with diabetes have a two- to fourfold higher risk for having cardiovascular events than nondiabetics. Up to one half of type 2 diabetics have coronary heart disease (CHD). People with diabetes are recognized as having coronary event risks comparable to individuals with established CHD.

For men between the ages of 35 and 64, diabetes mellitus increases the risk of congestive heart failure by 4 times. For women between the same ages, it increases by 8 times.

COMPLIMENTS OF:



Understanding Your Cholesterol and Diabetes Test Results

Tested by: Cholestech LDX® and Cholestech GDX™ Systems

		Desirable ¹	
		mg/dL	mmol/L
Name	_____		
Date	_____		
Total Cholesterol	_____	TC < 200	< 5.17
Triglycerides	_____	TRG < 150	< 1.69
Glucose	_____	GLU ² < 100	< 5.6
HDL	_____	HDL > 40	> 1.03
LDL	_____	LDL < 130	< 3.36
TC/HDL Ratio	_____	4.5 or less	
hs-CRP	_____	<3 mg/L ³	
ALT	_____	10–40 U/L	
AST	_____	10–30 U/L	
Blood Pressure	_____	< 120 / 80 mmHg ⁴	
A1C	_____	< 7% ²	

¹Based on NCEP ATP III
²Based on ADA (2005)
³Based on CDC/AHA
⁴Based on JNC7

FASTING

- YES** (No food or drink, except water, in last 9–12 hours.)
 NO (Fasting is required for accurate triglyceride, glucose, and LDL values.)

Read this brochure for a detailed explanation of test results, terminology, and levels of risk.

What Puts You at Risk for Coronary Heart Disease?

Risk Factors You Can't Do Anything About:

- Family History of Premature Coronary Heart Disease
- Age

Risk Factors You Can Do Something About:

Your healthcare professional can provide advice and possible preventive treatment for many of the following risk factors.

- High LDL (Above 130 mg/dL)
“Bad” Cholesterol
- Low HDL (Less than 40 mg/dL)
“Good” Cholesterol
- High hs-CRP (Above 3 mg/L)*
- High Blood Pressure (Above 140/90 mmHg)
- High Blood Glucose (Diabetes)
- Overweight
- Smoking
- Inactivity and Lack of Exercise
- High-Stress Environment

*Based on CDC/AHA

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Understanding Your Test Results.

A **Lipid Profile** is a detailed measure of the fats in your blood. It consists of measuring your total cholesterol, HDL cholesterol, and triglycerides and calculating your LDL cholesterol. NCEP (National Cholesterol Education Program—a study by a panel of experts) ATP III Guidelines recommend a complete lipid profile as the initial test and testing every 6 weeks until lipid goals are met and every 4–6 months thereafter.

Cholesterol is one of several components that form your lipid profile. **Total Cholesterol (TC)** is a measure of the total amount of both “good” and “bad” cholesterol in your blood at a given time.

TC is measured in milligrams per deciliter (mg/dL). A TC of less than 200 mg/dL is desirable.

The “good” cholesterol is called **High Density Lipoprotein (HDL)** cholesterol. It removes excess cholesterol from your arteries and moves it to the liver for further processing or to be eliminated from the body.

The higher your HDL, the better. An HDL of 60 mg/dL or higher is beneficial and considered a negative risk factor. An HDL of 40 mg/dL or lower is considered a risk factor for heart disease.

A TC/HDL Ratio is total cholesterol divided by HDL cholesterol. Some healthcare professionals may use this ratio to assess risk for developing heart disease—lower ratios are associated with lower risk.

Triglycerides (TRG) are composed of fatty acids and glycerol. Like cholesterol, they circulate in your blood, but are stored in body fat and used when the body needs extra energy. While your triglyceride level can be significantly affected by how recently you’ve eaten, total cholesterol and HDL are only slightly affected.

After eating, your triglyceride level increases significantly. If your body processes the fat efficiently, the level of triglycerides will decrease naturally. Your fasting triglyceride level should be below 150 mg/dL.

The “bad” cholesterol is called **Low Density Lipoprotein (LDL)** cholesterol. It contributes to the buildup of fat deposits in your arteries (atherosclerosis), which can cause decreased blood flow and heart attack.

About 65% of the cholesterol in your blood is LDL. An LDL of less than 130 mg/dL is desirable. If you have a personal history of coronary heart disease or diabetes, or if you have multiple risk factors, your LDL should be below 100 mg/dL.

Your healthcare professional will carefully examine the test results of your lipid profile to fully assess your risk for coronary heart disease.

Other Important Tests:

Alanine Aminotransferase (ALT) and **Aspartate Aminotransferase (AST)** are enzymes that are measured to determine the function of your liver. A normal ALT range is 10–40 U/L (units per liter) and a normal AST range is 10–30 U/L. Your ALT and AST levels will need to be monitored if you are on certain drugs to lower cholesterol, to control diabetes, or to treat various other diseases.

Glucose (GLU) is a measure of the sugar level in your blood. Fasting glucose levels should be below 100 mg/dL.

If you are overweight or have a family history of diabetes, your glucose levels should be checked periodically to see if you have diabetes.

High sensitivity C-Reactive Protein (hs-CRP) measurement is useful as an aid in the detection and evaluation of infection, tissue injury, inflammatory disorders and associated diseases. It can help your physician predict cardiovascular outcomes independently of other conventional markers of risk.*

An **A1C** test result reflects a patient’s average blood sugar level (blood glucose concentration) over the previous 2–3 months. It tells the patient and physician how well blood sugar levels are being controlled. These A1C values are not subject to the fluctuations that are seen with daily blood glucose monitoring.

*Increases in CRP are nonspecific and should be interpreted in the context of a complete clinical evaluation. If elevated values are observed in an apparently healthy individual, the test should be repeated in order to help rule out a recent response to undetected infection or tissue injury.

Periodic Testing Helps You Manage Cholesterol Levels and Diabetes

National Cholesterol Education Program (NCEP) Guidelines

NCEP Guidelines recommend regular cholesterol screening with a lipid profile for all adults, as well as for children in families with cardiovascular risk factors. Periodic lipid testing will determine whether you have met your goals or need more intensive treatment. NCEP Guidelines recommend that you test your lipids every 6 weeks until your goals are met and every 4–6 months thereafter.

American Diabetes Association (ADA) Recommendations

The ADA recommends A1C as the best test to find out if a patient’s blood sugar is under control over time. The test should be performed every 3 months for insulin-treated patients, during treatment changes, or when blood sugar is elevated. For stable patients on prescription drugs, the recommended frequency is at least twice a year. According to the ADA, the target A1C value is <7%. Lower glycemic goals (i.e., a normal A1C, <6%) may further reduce complications (at the cost of increased risk of hypoglycemia).