

# (LDL SUBFRACTIONS)

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## Introduction

### Importance of LDL

The presence of low molecular weight low density lipoprotein (LDL) particles in plasma has been associated with premature coronary artery disease. The health risk is much clearer when you understand that low density lipoproteins (LDL) carry about 70% of the blood's cholesterol.

### What are subfractions

Testing LDL subfractions is important because these particles have been associated with increased risk of CAD, even when the total level of LDL cholesterol is "normal." These LDL particles are taken up by cells in the blood vessel wall and can be oxidized. This can lead to plaque buildup or coronary artery disease (CAD). Seven major LDL bands (LDL-1 to LDL-7) were observed in different individuals, with most subjects having either one or two major bands.

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## Test Overview

LDL subfractions provide a more in-depth assessment of CAD risk while the commonly performed total LDL cholesterol test gives limited information. Lipoprotein subfraction offers useful information in assessing risk in patients who have a personal or family history of early heart disease especially if their total and LDL cholesterol values are not significantly elevated.

LDL subfraction testing is more common than VLDL or HDL subfraction testing since LDL has been identified as the primary risk factor for heart disease and more research and development has focused on LDL measurement.

Subfraction testing is typically done along with a lipid profile. The subfractions are usually expressed as relative proportions or percents of the LDL, VLDL, and/or HDL.

Since subfractions may be affected by lipid treatment and/or lifestyle changes, LDL subfraction testing may also be occasionally ordered to monitor the effectiveness of treatment in decreasing the number of small dense LDL particles.

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### Why It Is Done

Lipoprotein subfraction testing may be ordered as part of an overall evaluation of cardiac risk when someone has a personal or family history of early CAD, especially when they don't have typical cardiac risk factors, such as high cholesterol, high LDL, high triglyceride, low HDL, smoking, obesity, inactivity, diabetes, and/or hypertension.

When a patient with a large proportion of small dense LDL particles has undergone lipid lowering treatment or lifestyle changes, his doctor may order LDL lipoprotein subfraction testing, along with other lipid tests, to monitor the effectiveness of treatment.

Although it is not generally recommended as a screening test, a few doctors are ordering lipoproteins subfraction testing along with a battery of other cardiac risk tests when they are attempting to determine a patient's overall risk of developing CAD

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### How to Prepare

Preparation depends on the test. Ask your doctor which test you are having. For example, you can get a total cholesterol test or direct LDL test at any time, even if you recently had a meal or a snack. But you will likely not eat for a few hours before a test that measures LDL, HDL, and triglycerides.

- If your doctor tells you to fast before your test, do not eat or drink anything except water for 9 to 12 hours before having your blood drawn. Usually, you are allowed to take your medicines with water the morning of the test. Fasting is not always necessary, but it may be recommended.
- Do not eat high-fat foods the night before the test.

- Do not drink alcohol or exercise strenuously before the test.

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## How It Is Done

The health professional (phlebotomist) taking a sample of your blood will:

- Wrap an elastic band around your upper arm to stop the flow of blood. This makes the veins below the band larger so it is easier to put a needle into the vein.
- Clean the needle site with alcohol.
- Put the needle into the vein. More than one needle stick may be needed.
- Attach a tube to the needle to fill it with blood.
- Remove the band from your arm when enough blood is collected.
- Put a gauze pad or cotton ball over the needle site as the needle is removed.
- Put pressure on the site and then put on a bandage.

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## Results:

In general, the result is interpreted within the framework of a lipid profile and its associated risk. If the patient has primarily small dense LDL, this finding will add to the risk of developing CAD above and beyond the risk associated with the total LDL. On the other hand, the presence of exclusively large fluffy LDL will add no additional risk. The interpretation of the VLDL subfraction is similar. The picture is more complex with HDL subfractions, however, and there is no consensus on how to include the findings in risk assessment, but in general the presence of large fluffy HDL is thought to offer more protection than small dense HDL.

Test Result: Pls refer the report

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## What Affects the Test?

Reasons you may not be able to have the test or why the results may not be helpful include:

- Medicines, such as diuretics, corticosteroids, male sex hormones (androgens), tranquilizers, estrogen, birth control pills, antibiotics, and niacin (vitamin B3).
- Physical stress, such as infection, heart attack, surgery.
- Eating 9 to 12 hours before the test.
- Other conditions, such as hypothyroidism, diabetes, or kidney or liver disease.
- Alcohol or drug abuse or withdrawal.
- Liver disease (such as cirrhosis or hepatitis), malnutrition, or hyperthyroidism.
- Pregnancy. Values are the highest during the third trimester and usually return to the pre-pregnancy levels after delivery of the baby.

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### Need to Know More?

- This test attempts to evaluate a patient's statistical risk of developing CAD, but it cannot predict the development or severity of CAD in a particular patient.
- Results of lipoprotein subfraction testing reflect the method and reporting format used as well as the patient's total LDL-cholesterol, VLDL, and/or HDL-cholesterol.
- Since different methods separate the subclasses based on different physical properties (size, density, and/or electrical charge), results may not be directly comparable method to method or laboratory to laboratory.

IMAGE: CHOLESTROL DEPOSITIONS

