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Medical Encyclopedia: LDL

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Alternative names

Low density lipoprotein

Definition

LDL is a test that measures the amount of low-density lipoprotein (LDL) cholesterol in blood serum.

How the test is performed

Blood is drawn from a vein, usually from the inside of the elbow or the back of the hand. The puncture site is cleaned with antiseptic. An elastic band is placed around the upper arm to apply pressure and cause the vein to swell with blood.

A needle is inserted into the vein, and the blood is collected in an air-tight vial or a syringe. During the procedure, the band is removed to restore circulation. Once the blood has been collected, the needle is removed, and the puncture site is covered to stop any bleeding.

In infants or young children:

The area is cleansed with antiseptic and punctured with a sharp needle or a lancet. The blood may be collected in a pipette (small glass tube), on a slide, onto a test strip, or into a small container. A bandage may be applied to the puncture site if there is any bleeding.

How to prepare for the test

You may be told not to eat anything for 9 - 12 hours before the test.

The health care provider may tell you to stop taking certain drugs before the procedure.

How the test will feel

When the needle is inserted to draw blood, you may feel moderate pain, or only a prick or stinging sensation. Afterward, there may be some throbbing.

Why the test is performed

This test is usually performed as part of an evaluation of coronary risk factors.

Cholesterol is an important, normal part of the structure of our cell membranes, bile acids, and steroid hormones. Since cholesterol does not dissolve in water, most cholesterol is carried in the blood by lipoproteins -- large protein-like molecules, including chylomicrons, very low density lipoprotein (VLDL), high density lipoprotein (HDL),

and LDL. Chylomicrons are lipoproteins that are present shortly after a meal, but disappear within about 2 hours in "normal" people.

The main function of LDL seems to be to carry cholesterol to various tissues throughout the body. The laboratory actually measures the cholesterol portion of the LDL molecule, rather than the actual concentration of LDL in the blood. This is also true for HDL and VLDL. The total cholesterol level is the sum of LDL, HDL, and VLDL cholesterol.

Excess cholesterol in the blood has been correlated with cardiovascular disease. LDL is sometimes referred to as "bad" cholesterol, because elevated levels of LDL correlate most directly with coronary heart disease.

According to the National Heart, Lung, and Blood Institute, your LDL cholesterol level is a better indicator of your risk for a heart attack and stroke than total cholesterol. The lower your LDL, the lower your risk for heart disease or stroke.

Normal Values

A healthy LDL level is one that falls in the optimal or near-optimal range.

- **Optimal:** Less than 100 mg/dL
- **Near Optimal:** 100-129 mg/dL
- **Borderline High:** 130-159 mg/dL
- **High:** 160-189 mg/dL
- **Very High:** 190 mg/dL and higher

Goal LDL levels for patients at high risk for atherosclerosis -- such as patients with diabetes -- or those with known heart disease may be even lower than 100 mg/dL.

Normal value ranges may vary slightly among different laboratories.

What abnormal results mean

High levels of LDL may be associated with:

- Increased risk of atherosclerotic heart disease
- Familial hyperlipoproteinemia

Lower-than-normal levels of LDL may be caused by:

- Malabsorption (inadequate absorption of nutrients from the intestinal tract)
- Malnutrition

Additional conditions under which the test may be performed:

- Familial combined hyperlipidemia
- Familial dysbetalipoproteinemia
- Familial hypertriglyceridemia

What the risks are

- Excessive bleeding
- Fainting or feeling light-headed
- Hematoma (blood accumulating under the skin)

- Infection (a slight risk any time the skin is broken)
- Multiple punctures to locate veins

Special considerations

Drugs that can increase lipoprotein levels include aspirin, oral contraceptives, phenothiazines, corticosteroids, and sulfonamides.

Veins and arteries vary in size from one patient to another, and from one side of the body to the other. Obtaining a blood sample from some people may be more difficult than from others.

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