

High-Density Lipoprotein (HDL) Cholesterol

WHAT IS HDL CHOLESTEROL?

Cholesterol is a waxy type of fat (lipid), which travels around the body in the blood. It is an essential molecule, as it is required for building cells, producing bile for digestion, and making vitamins and hormones. Cholesterol is produced in adequate quantities in the liver, but can also be obtained from foods from animals (1).

Cholesterol carried by high-density lipoproteins (HDL) is considered "good" cholesterol. HDL collects cholesterol from around the body, and delivers it to the liver for recycling or excretion. HDL also carries cholesterol to other organs, where it is used to produce hormones. In addition, HDL cholesterol plays a role in protecting and maintaining the inner walls of the blood vessels by repairing damaged sites (2,3).

PURPOSE OF AN HDL CHOLESTEROL TEST

Low levels of HDL cholesterol can cause an imbalance between the "good" HDL cholesterol and the "bad" LDL cholesterol. This usually does not cause any symptoms until serious complications occur, such as a heart attack or stroke. This simple blood test can accurately measure cholesterol levels, allowing patients to be proactive in improving cardiovascular health before a serious health issue occurs.

HDL CHOLESTEROL REFERENCE RANGES

HDL cholesterol levels between 40 – 50 mg/dL for men and 50 – 59 mg/dL for women are considered optimal. Low HDL cholesterol levels (< 40 mg/dL for men and < 50 mg/dL for women) increase the risk of heart disease, independent of other risk factors associated with heart disease, including LDL "bad" cholesterol. High levels of HDL cholesterol (\geq 60 mg/dL) may offer protection from heart disease in both men and women (4,5). However, there is evidence that people who naturally have extremely high HDL levels (above 100 mg/dL) may actually have an increased risk of cardiovascular disease (6).

TESTING RECOMMENDATIONS

The Adult Treatment Panel of the National Cholesterol Education Program (NCEP) recommends that all adults 20 years of age and over should have a fasting lipoprotein profile (total cholesterol, LDL cholesterol, HDL cholesterol, and triglyceride) once every five years to screen for coronary heart disease risk (4).

INCREASING HDL CHOLESTEROL

The same changes that help lower triglycerides and LDL "bad" cholesterol are also effective for increasing HDL "good" cholesterol. Exercise, maintaining a healthy weight, and abstaining from smoking are proven ways to increase HDL cholesterol levels and improve cardiovascular health (7).

TEST PROCEDURE

Correct specimen collection and handling is required for optimal assay performance.

This test requires a blood sample from a finger prick. All supplies for sample collection are provided in this kit. First wash and dry hands. Warm hands aid in blood collection. Clean the finger prick site with the alcohol swab and allow to air dry. Use the provided lancet to puncture the skin in one quick, continuous and deliberate stroke. Wipe away the first drop of blood (as it may be contaminated with tissue fluid or skin debris). Massage finger to increase blood flow at the puncture site and hold in a position that gravity facilitates the collection of blood on the fingertip. Transfer the blood to the blood collection card or blood

collection tube (microtainer).

Avoid squeezing or 'milking' the finger excessively. If blood flow stops, perform a second skin puncture on another finger, if more blood is required.

Dispose of all sharps safely and return sample to the laboratory in the provided prepaid return shipping envelope.

Upon receipt at the laboratory, the blood sample is analyzed by the fully automated Alinity c Ultra DHL assay on the Alinity ci series analyzer. This assay determines HDL cholesterol levels using accelerator selective detergent methodology, where the concentration of HDL cholesterol in the blood sample is proportional to the absorbance of a specific dye produced in the final step of a complex multi-step analysis.

TEST INTERPRETATION

This assay will provide an accurate HDL cholesterol level for the tested blood specimen. HDL cholesterol below 40 mg/dL is considered a risk factor for heart disease, while levels of 60 mg/dL and higher may be protective from heart disease. These values were obtained from the Alinity c Ultra HDL package insert (8), which follows recommendations from the National Cholesterol Education Program (NCEP) Adult Treatment Panel III Report (4).

DISCLAIMERS/LIMITATIONS

Infections, stress, pregnancy, and certain medications can all affect cholesterol results. In addition, abnormal results may be due to other factors other than cardiovascular disease, such as disrupted liver or thyroid function.

These results should be interpreted in conjunction with other laboratory and clinical information.

Additional testing is recommended if HDL cholesterol levels are inconsistent with clinical evidence.

Correct specimen collection and handling is required for optimal assay performance.

Interferences from medication or endogenous substances may affect results.

Abnormal liver function can affect lipid metabolism and HDL cholesterol levels.

Elevated concentrations of N-acetyl-L-cysteine may lead to falsely low HDL levels in this assay.

REFERENCES

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- (4) Third Report of the National Cholesterol Education Program (NCEP) Expert Panel on Detection, Evaluation, and Treatment of High Blood Cholesterol in Adults (Adult Treatment Panel III) final report. (2002). *Circulation*. 106 (25), 3143-421.
- (5) Gordon T, et al. (1977). High density lipoprotein as a protective factor against coronary heart disease. *Am J Med*. 62 (5), 707.
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