GENETRACK Diagnostics

Cholesterol, Total

WHAT IS 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).

PURPOSE OF A CHOLESTEROL TEST
High cholesterol 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. Cholesterol tests are also commonly used to check for responses to medications (e.g., statins).

CHOLESTEROL REFERENCE RANGES
Although it is important to have enough cholesterol, excess cholesterol can cause health complications. Total cholesterol levels below 200 mg/dL are considered desirable for adults. Cholesterol levels of 200 – 239 mg/dL are borderline high, while levels of 240 mg/dL and above are considered unhealthy (2).

For children, desirable levels are below 170 mg/mL, borderline high is 170 – 199 mg/dL, and ≥ 200 mg/dL is unhealthy (2).

TYPES OF CHOLESTEROL
Cholesterol is transported around the body by lipoproteins. The two main lipoproteins are low-density lipoprotein (LDL) and high-density lipoprotein (HDL).

Cholesterol carried by LDL is often called “bad” cholesterol. LDL deposits excess cholesterol in blood vessel walls, where it accumulates, leading to hardening of the arteries, atherosclerosis, and blood clots. LDL cholesterol levels are often considered to be the best predictor of the risk of heart disease (3).

Cholesterol carried by 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 (3).

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 (2).

ELEVATED CHOLESTEROL
High levels of cholesterol (hypercholesterolemia) can result in an accumulation in the arteries and plaque formation. This significantly increases the risk of a heart attack, stroke, and peripheral artery disease (4).

Various factors can contribute to hypercholesterolemia, including a high intake of saturated fats (from red meat and dairy) and refined sugars, high alcohol consumption, physical inactivity, smoking, and being overweight or obese. Each of these risk factors can be modified by dietary and lifestyle changes (5). There are also risk factors that cannot be changed, including a genetic risk and other medical conditions (6).

LOWERING CHOLESTEROL
A combination of losing weight, diet, and exercise are beneficial for reducing high cholesterol. Specific changes include limiting carbohydrate, alcohol, and fat intake, and choosing healthier unsaturated fats instead of saturated and trans fats. Abstaining from smoking and exercising for at least 30 minutes each day are also beneficial (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 Cholesterol assay on the Alinity ci series analyzer. This assay determines total cholesterol levels using enzymatic methodology, where the concentration of 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 cholesterol level for the tested blood specimen. Normal cholesterol levels in adult serum are < 200 mg/dL, borderline high levels are 200 – 239 mg/dL, and high levels are ≥ 240 mg/dL. These values were obtained from the Alinity c Cholesterol package insert (8), which follows recommendations from the National Cholesterol Education Program (NCEP) Adult Treatment Panel III Report (2).

DISCLAIMERS/LIMITATIONS
Factors that may affect your Total Cholesterol Test results include having an active infection, stress, pregnancy, and certain medications. 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 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.

REFERENCES

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