

Cholesterol is part of the lipoprotein complex in plasma that is essential for cellular metabolism. Triglycerides, natural fats synthesized from carbohydrates, are used for energy. Both are major lipids transported on **lipoproteins**, a combination of lipids and proteins, which include:

Low-density lipoproteins (LDLs): LDL is the major carrier of cholesterol to the cells. Cells use cholesterol for synthesis of membranes and steroid production. Elevated circulating LDL is a strong risk factor in cardiovascular disease. In addition, particle size and density of LDL may affect overall risk, with small, dense particles associated with increased atherosclerosis.

High-density lipoproteins (HDLs): HDL cholesterol contains very low concentrations of triglycerides, relatively little cholesterol, and high levels of protein. They transport free cholesterol to the liver for excretion in the bile. High levels of HDL are thought to be protective against cardiovascular disease.

Very-low-density lipoproteins (VLDLs): Contain high concentration of triglycerides, some cholesterol and a little protein. Triglycerides are the main storage form of fuel or energy for the body.

Diagnostic Evaluation

Hyperlipidemia can have a genetic basis (familial homozygous or heterozygous), and/or a lifestyle component, or can be caused by secondary problems, such as hypothyroidism. Hyperlipidemia is diagnosed on the basis of analysis of blood. A complete lipid profile should be drawn after a 12-hour fast. In children with elevated cholesterol levels, a screening thyroid-stimulating hormone is measured at diagnosis in order to rule out hypothyroidism as a cause of secondary hypercholesterolemia. Additional blood work is individualized based on other risk factors. Lipid values may be affected by recent high fevers and therefore cholesterol values should not be drawn if a child has had a fever within the past 3 weeks. Diagnostic values for acceptable, borderline, and high total cholesterol and LDL cholesterol levels are listed in [Table 23-5](#).