Lipids in Atherosclerotic Cardiovascular Disease (ASCVD) Risk Assessment and Management

**Lipids and ASCVD Risk**
Lipoproteins carry cholesterol and triglycerides (TG) and play a direct, causal role in the development of atherosclerosis. Cumulatively, the longer the exposure to high levels of low-density lipoprotein (LDL), and to a lesser degree other apolipoprotein B (apoB)-containing lipoprotein particles, the greater the risk for ASCVD events. In both fasting and nonfasting states, LDL particles comprise over 90% of all apo B particles.

LDL concentration determination in clinical practice has routinely been provided by LDL cholesterol (LDL-C) calculated by the Friedewald equation: calculated LDL-C = total cholesterol – HDL cholesterol (HDL-C) - TG/5. Although the equation is reasonably accurate in patients with “normal” fasting TG values, calculated LDL-C is not accurate in the postprandial, nonfasting state or when fasting TG is elevated. LDL-C is additionally limited by the fact that, even when accurately measured, it fails in many individuals to reliably reflect the number of atherogenic particles. When LDL-C and measures of atherogenic particles disagree, atherogenic particle number more accurately reflects an individual’s ASCVD risk.

One solution to these limitations is to assess non-HDL cholesterol (non-HDL-C), a different lipid calculation, which represents the cholesterol carried in all apoB-containing lipoproteins. Non-HDL-C is simply total cholesterol minus HDL-C, and is equally accurate when measured in fasting and nonfasting samples. Furthermore, in patients with elevated TG levels, non-HDL-C is superior to LDL-C as a measure of ASCVD risk.

**Targeting Lipid Values with Lipid Modification Therapy**
Since 2002, successive national and international guidelines have emphasized strategies to lower LDL as a means to reduce ASCVD risk. The guiding principle adopted by groups such as the National Cholesterol Education Program (NCEP) Adult Treatment Panel (ATP) was to link LDL-C and non-HDL-C goals to the level of ASCVD risk - the higher the patient’s risk, the lower the goal levels of LDL-C and non-HDL-C to mitigate that risk.

In 2013 the American College of Cardiology (ACC) and American Heart Association (AHA) issued The ACC/AHA Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular Disease in Adults. This Guideline shifted the priority away from achieving specific lipid targets to the use of therapies providing demonstrated improvement in clinical outcomes. As a result, moderate- and high-intensity statin therapy was advocated as initial therapy for several defined patient groups.

Once lipid-lowering therapy is initiated, all guidelines advocate [regular/ongoing] lipid testing to evaluate medication compliance and individual response to treatment. The ACC recently clarified its position concerning on-treatment testing by suggesting consideration of percent LDL-C reduction, as well as LDL-C and non-HDL-C levels, to aid decision-making regarding potential need for additional lipid-altering therapy.

Guidelines and recommendations from other national and international specialty groups cite the advantages of non-HDL-C over LDL-C and the benefits of HDL-C to guide clinical management. Besides having a stronger association with ASCVD risk, non-HDL-C measurement is unaffected by non-fasting, thereby offering patients and clinicians additional convenience.
LabCorp maintains its practice of aligning its test menu with guideline recommendations and offering test options that support the individual needs of clinicians and their patients. Below is a partial list of available lipid measures.

<table>
<thead>
<tr>
<th>Test Name</th>
<th>Test No.</th>
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<tbody>
<tr>
<td>Lipid Cascade With Reflex to Lipoprotein Particle Assessment by NMR (With Graph)</td>
<td>123836</td>
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<tr>
<td>Lipid Profile With Non-HDL Cholesterol</td>
<td>343925</td>
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<tr>
<td>Non-HDL Cholesterol Profile</td>
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<td>Lipid Cascade With Reflex to Lipoprotein Particle Assessment by NMR (Without Graph)</td>
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<td>Familial Hypercholesterolemia (FH) Screen</td>
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<td>Lipid Cascade With Reflex to Apolipoprotein B</td>
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<td>Lipid Profile, Fasting, Pediatric</td>
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<td>Lipid Profile, Nonfasting, Pediatric</td>
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For the most current information regarding test options, including specimen requirements and CPT codes, please consult the online Test Menu at [www.LabCorp.com](http://www.LabCorp.com).

References: