Lipid Panel (LIPID) LDL Cholesterol Calculation Update

Date: December 13th, 2024

Effective Date: January 13th, 2025

UR Medicine Labs will update the low-density lipoprotein cholesterol (LDL-C) equation from the Friedewald formula to the National Institutes of Health (NIH) equation. The NIH equation provides a more accurate calculated LDL result, especially in patients with low LDL concentrations and offers valid LDL-C results with triglyceride concentrations up to 800mg/dL.

Why is this change being made?
The Friedewald equation has been widely used for calculating LDL-C since its introduction in 1972. However, it is often inaccurate for low LDL-C concentrations and in patients with high TG concentrations. In 2020, the NIH Clinical Center, identified a better way to estimate VLDL-C concentrations. This led to the development of a new, more complex, and more accurate equation for estimating LDL-C.

Friedewald equation:

LDL-C = Total Cholesterol - HDL-C - (TG/5)

NIH equation:

LDL-C = TC/0.948 - HDL/0.971 - (TG/8.56 + ([TG × non-HDL-C])/2140 - TG^2/16,100) - 9.44

What this means:
The NIH equation demonstrates 94% agreement with the Friedewald equation, while improving accuracy in low LDL-C cases and refining risk classifications for 6% of patients. This equation will be applied regardless of fasting status. An estimated LDL-C will be reported for samples with triglyceride (TG) up to 800 mg/dL. When TG is >800 mg/dL, a reflexive Direct LDL test (lab code: LDL) will be performed. Previously, with the Friedewald equation, the reflex cutoff for Direct LDL testing was a TG concentration of 400 mg/dL.

For any questions, please contact:

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