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A New, Improved Calculation for Low-density Lipoprotein Cholesterol (LDL-C)

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Heart disease remains the leading cause of the death in the United States, even during the pandemic, with an estimated 655,000 deaths in 2018. Although cardiovascular heart disease (CVD) is multifactorial, one of the most common targets to monitor and treat with is LDL-C. Epidemiologic data has shown a graded relationship between elevations in LDL-C and the occurrence of CVD. Lowering the LDL-C reduces the risk of CVD, both in patients with and without a history of a cardiovascular event.

Although direct measurement of LDL-C is available, the majority of lipid evaluations are done by the AMA defined lipid panel (CPT 80061) that includes a calculated LDL-C. Most labs use the Friedewald equation to calculate the LDL-C. The Friedewald equation rapidly loses accuracy when triglycerides (TG) are less than 70 mg/dl or greater than 400 mg/dl. The impact of elevated TG on this calculation has been the primary reason for a recommendation of fasting for the lipid panel.

The NIH, in collaboration with LabCorp, the Mayo Clinic and other institutions has come up with a new equation and validated it on over 250,000 patient samples. The NIH LDL-C equation is valid with TG up to 800 mg/dl and is not affected by fasting. In their publication they estimate 35% fewer misclassifications into treatment groups when the TG are between 400-800 mg/dl. At Bronson on the standard lipid panel (Epic LAB18) we will change from TG >400 mg/dl to >800 mg/dl to initiate a reflex order for the measured LDL. We will also continue to offer the lipid panel without the reflex option (Epic LAB2211).

The Bronson Laboratories plans to implement the new equation on January 5, 2021.

Summary

- The NIH LDL-C equation is more accurate and allows better classification into risk and treatment groups for cardiovascular heart disease
- Patient fasting is not required or even recommended
- The new equation will result in cost savings with fewer direct LDL-C measurements being needed

Reference:

A New Equation for Calculation of Low-Density Lipoprotein Cholesterol in Patients With Normolipidemia and/or Hypertriglyceridemia
Maureen Sampson, BS[1]; Clarence Ling, PhD[1]; Qian Sun, PhD[1]et al *JAMA Cardiol.* 2020;5(5):540-548. https://www.labcorp.com/provider-services/resources/publications/new-equation-calculation-low-density-lipoprotein

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