

Memorandum

To: Northwell Health Laboratories' Clients

From: Dwayne Breining, M.D., Executive Director, Northwell Health Laboratories

Date: July 10, 2023

Re: Sampson/NIH equation for calculating low-density lipoprotein (LDL) cholesterol

Dear Valued Northwell Health Laboratories' Clients,

On the effective day, Northwell Health Laboratories, as part of its sustained commitment towards improving patient's clinical outcomes, will implement the Sampson/NIH equation for the calculation of low-density lipoprotein (LDL) cholesterol¹. Elevated LDL cholesterol contributes to atherosclerotic cardiovascular disease.

When compared to the current Friedewald equation for LDL cholesterol calculation², the Sampson/NIH equation provides a more accurate estimate of LDL cholesterol in patients with elevated triglyceride concentrations (up to 800 mg/dL), as well as in patients on lipid lowering therapy who often have low concentrations of LDL cholesterol (< 70 mg/dL).

$$\text{Friedewald LDLc Equation} = \text{Total Cholesterol} - \text{HDLc} - \frac{\text{Trig}}{5}$$

$$\text{Sampson/NIH LDLc Equation} = \frac{\text{Total Cholesterol}}{0.948} - \frac{\text{HDLc}}{0.971} - \left(\frac{\text{Trig}}{8.56} + \frac{\text{Trig} \times \text{nonHDLc}}{2140} - \frac{\text{Trig}^2}{16100} \right) - 9.44$$

where HDLc = HDL cholesterol; nonHDLc = non-HDL cholesterol; Trig = Triglyceride

Sincerely,

Dr. Breining and Your Northwell Health Laboratories Clinical Chemistry Team

If you have any questions, please contact Client Services at (800) 472-5757.

References

1. Sampson M, Ling C, Sun Q, et al. A New Equation for Calculation of Low-Density Lipoprotein Cholesterol in Patients With Normolipidemia and/or Hypertriglyceridemia. *JAMA Cardiol.* 2020;5(5):540–548. doi:10.1001/jamacardio.2020.0013
2. Friedewald WT, Levy RI, Fredrickson DS. Estimation of the concentration of low-density lipoprotein cholesterol in plasma, without use of the preparative ultracentrifuge. *Clin Chem.* 1972;18(6):499-502. doi:10.1093/clinchem/18.6.499



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