pathlab



March 2022

LDL equation / LH&FSH reference intervals update

Waikato DHB and Pathlab will implement a new LDL- Cholesterol (LDL-C) equation on 16th May 2022.

The Friedwald equation has been used to calculate LDL since 1972. Friedewald knew that with increasing triglyceride levels, the calculated LDL-C was progressively falsely lower when compared with the gold standard technique and therefore Friedewald stated LDL-C should not be calculated when triglycerides are > 4.5 mmol/L. With much lower LDL-C levels seen in the statin era, an improved calculation was required, hence the Sampson equation.

Comparing both equations with the gold standard ultracentrifugation method, Sampson LDL-C offers similar or better accuracy than Friedewald LDL-C at any triglyceride level. Sampson LDL-C can also be calculated up to a triglyceride level of 9 mmol/L.

A few patient examples:

CHOL	HDL	TRIG	Friedewald LDL	Sampson LDL
2.5	0.41	4	0.3	0.8
3.9	0.8	4.4	1.1	1.5
5.2	1.07	2	3.2	3.3
7	1.59	4.3	3.5	3.6
7.9	1.57	1.4	5.7	5.8
9.4	1.62	3.2	6.3	6.2

Equations (all in mmol/L):

Friedewald: LDL-C = TC – HDL-C – Triglycerides/2.2.

Sampson: $LDL\text{-}C=TC/0.948-HDL\text{-}C/0.971-(TG/8.56+TG \times non\text{-}HDL\text{-}C/2140 - TG^2/16100)-9.44$.

A Friedewald LDL-C can be (easily) calculated from the available lipid results if required.

LH&FSH

Although the LH and FSH assays as well as the adult reference intervals are unchanged, the paediatric reference intervals have been updated. These changes are mostly relevant to paediatric endocrinologists when investigating premature or delayed puberty.

Please contact Dr Stephen duToit with any queries:
021 245 8325 or email stephen.dutoit@waikatodhb.health.nz.

CLINICAL UPDATE