

UNDERSTANDING NON-HDLC, APOB AND PARTICLE NUMBER

INTRODUCTION

A controversy in lipidology has centered on the clinical utility of apolipoprotein B (apoB), non-HDL cholesterol (non-HDLc), and lipoprotein particles (particle number) to predict angiographic disease or coronary heart disease (CHD) events.

The crux of the issue is that apoB, non-HDLc and particle number are essentially measuring the same thing—the total amount of atherogenic particles. There is a strong positive correlation between apoB levels and non-HDL cholesterol concentrations¹ because non-HDLc represents the sum of LDL, Lp(a), IDL and VLDL, each of which has one apoB protein attached.²

However, while each of the cholesterol components that make up these values plays a role in CHD, they do not have the same atherogenic potential. This topic was discussed at length in an editorial by Scott Grundy, chairman of the National Cholesterol Education Program ATP II and ATP III guideline committees.³ As a result, it is vital to measure these individual components, as well as LDL pattern, in order to accurately stratify risk.

A POCKET FULL OF CHANGE

Assume that determining CHD risk based on apoB, non-HDLc and particle number is analogous to determining the monetary value of a pocket full of change. In this case, the “richer” you are, the greater your risk. In this analogy, a half dollar represents Lp(a), quarters represent LDL Pattern B, dimes represent IDL, nickels represent LDL Pattern A and pennies represent VLDL. Individually, non-HDLc, apoB and particle number would tell you how many coins you have, but none of these single assays could determine how “rich” you are — your overall risk. To determine overall risk, both the quantity and types of coins would need to be reported.

The VAP[®] Cholesterol Test measures non-HDLc and also separately reports the individual components of non-HDLc [LDL, IDL, Lp(a) and VLDL], as well as LDL and VLDL pattern size. This comprehensive information allows a more accurate stratification of CHD risk than can be obtained by relying on a total cholesterol or particle number value alone.



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Table 1: Lipid & Lipid Subclass Acronyms

Acronym	Definition
LDL	Low-Density Lipoprotein
HDL	High-Density Lipoprotein
TG	Triglycerides
Lp(a)	Lipoprotein(a)
IDL	Intermediate-Density Lipoprotein
VLDL	Very Low-Density Lipoprotein
LDL Pattern B	Small, Dense LDL (more atherogenic)
LDL Pattern A	Large, Buoyant LDL (less atherogenic)

References

- ¹ Brown G, Albers JJ, Fisher LD, et al. Regression of coronary artery disease as a result of intensive lipid-lowering therapy in men with high levels of apolipoprotein B. *N Engl J Med.* 1990;323:1289-1298.
- ² Schmidt SB, Wasserman AG, Muesing RA, Schlesselman SE, Larosa JC, Ross AM. Lipoprotein and apolipoprotein levels in angiographically defined coronary atherosclerosis. *Am J Cardiol.* 1985;55:1459-1462.
- ³ Grundy SM. Small LDL, atherogenic dyslipidemia, and the metabolic syndrome. *Circulation.* 1997;95:1-4.