

HDL SUBFRACTIONS (serum)

High density lipoproteins (HDL) are a class of structurally and functionally heterogeneous particles; in atherosclerosis-related diseases, changes in HDL subfraction levels and functions are frequently observed.

HDLs have long been regarded as the 'medical knights in shining armour', gallantly protecting human hearts against that dreaded invader, coronary heart disease, by carrying cholesterol away from the arteries and back to the liver for disposal.

However, recent studies suggest that different HDL subclasses are associated with heart disease prevalence, and that measurement of these subclasses could be a better indicator of cardiovascular heart disease than measurement of total HDL alone. In fact, some HDL subfractions may actually have the potential of contributing to heart disease.

The HDL family forms a protective part of plasma lipoproteins. It consists of large HDL, intermediate HDL and small HDL subclasses. The large HDL and intermediate HDL subclasses are considered anti-atherogenic parts of the HDL family. The atherogenicity of the small HDL subclass is currently the subject of much discussion.

Traditionally, HDL has been separated into two major subclasses (HDL-2 and HDL-3), but depending on the separation method used, 10 subfractions have been reported.

The Liposcreen HDL Subfraction test, now readily allows the possibility to measure the levels of specific HDL subfractions in patients with atherosclerosis-related diseases, and may help to better define their cardiovascular risk. The test can measure the 10 HDL subfractions which are grouped into three main subclasses:

- HDL 1-3 represent the large HDL, commonly referred to as HDL-2, as the most protective of the arteries, or truly the 'good' HDL cholesterol;
- HDL 4-7 represent the intermediate HDL; and
- HDL 8-10 represent the small HDL and may indicate increased CHD risk.

Factors affecting HDL levels

Circulating levels of large HDL particles are decreased in dyslipidaemic conditions, while levels of small dense HDL particles are increased in patients with coronary heart disease.

Specific genetic defects in proteins involved in HDL metabolism significantly impact the distribution of HDL subpopulations.

Many drugs used for dyslipidaemia induce changes in HDL subfractions strictly related to cardiovascular disease.

Results

In a study of patients of diagnosed arterial hypertension and coronary heart disease (versus a control group), it was observed that the large HDL subclass level was reduced and the small HDL subclass level was increased (the intermediate HDL subclass was relatively unchanged).

These results were in concordance with the atherogenic, Non-Type A lipoprotein phenotype of individuals diagnosed with cardiovascular diseases and was further validated using the **Liposcreen LDL Subfractions** test which identified high levels of atherogenic, small dense LDLs. Conversely, in a group of subjects with a non-atherogenic hyper-betalipoproteinemia, increased levels of large and intermediate HDL subclasses were observed. The concentration of the small HDL subclass did not differ from that of the control group. In this non-atherogenic lipoprotein profile, only traces of atherogenic small dense LDL were identified.

Clinical Significance

In general, HDL Subfractions results are interpreted within the framework of a lipid profile and its associated risk. If the patient has primarily small dense LDL (determined through Liposcreen LDL subfractions test), this finding will add to the risk of developing CAD above and beyond the risk associated with the total LDL. On the other hand, the presence of exclusively large 'fluffy' LDL will add no additional risk. In general the presence of large HDL is thought to offer more protection than small dense HDL.

It is important to remember that the HDL lipoprotein subfraction testing (and other lipid and cardiac risk factor testing) is not diagnostic. It attempts to evaluate a patient's statistical risk of developing CAD but it cannot predict the development or severity of CAD in a particular patient.

HDL SUBFRACTIONS (serum) [Test code: 4030]

- ❖ Cholesterol, Triglycerides, HDL, HDL subfractions (x3)

Other cardiovascular and hypercholesterolemia tests available:

- **Cardiovascular Profile – Comprehensive [4001]:** Cholesterol, Triglycerides, HDL, LDL, ratios, Fasting Glucose, Homocysteine, Apolipoproteins A & B, Lipoprotein (a), Fibrinogen, hsCRP
- **Cardiovascular Profile – Comprehensive 2 [4027]:** Cholesterol, Triglycerides, HDL, LDL, ratios, Fasting Glucose, Homocysteine, Apolipoproteins A & B, Lipoprotein (a), Fibrinogen, hsCRP and LIPOSCREEN LDL subfractions (x7)
- **LIPOSCREEN LDL Subfractions [4028]:** Cholesterol, Triglycerides, HDL, LDL, VLDL, IDL, LDL subfractions (x7)
- **Oxidised LDL [4029]:** Oxidised LDL
- **LIPOSCREEN LDL Subfractions & Oxidised LDL [4031]:** Cholesterol, Triglycerides, HDL, LDL, VLDL, IDL, LDL subfractions (x7), Oxidised LDL
- **LIPOSCREEN LDL Subfractions & Oxidised LDL & HDL Subfractions [4032]:** Cholesterol, Triglycerides, HDL, LDL, VLDL, IDL, LDL subfractions (x7), Oxidised LDL; HDL subfractions (x3)

How to order a test kit:

To order a test kit simply request the test name and/or test code on a NutriPATH request form and have the patient phone NutriPATH Customer Service on 1300 688 522.



Phone **1300 688 522** for further details
www.nutripath.com.au