CV Health profile

sample type: BLOOD

CV Health Profile analyzes blood for state-of-the-art lipid markers and independent risk factors that illuminate the clinical complexity of cardiovascular disease (CVD). Together, these markers provide a thorough assessment of cardiovascular health status, revealing the biochemical environment associated with inflammation, lipid deposits, endothelial dysfunction, and clotting factors underlying cardiovascular disease.

The **CV Health Profile** is a comprehensive evaluation featuring an advanced lipid profile that utilizes NMR fractionation technology, independent risk markers (including lipoprotein-associated phospholipase or Lp-PLA_2), and a novel Insulin Resistance Score. All of these advanced markers play a critical role in the cardiovascular health. The insight they provide allows the clinician to more accurately address abnormalities relating to cardiac and vascular diseases.

Nearly 50% of all heart attack victims have normal levels of typical markers for CVD, including total cholesterol. For this reason, improved clinical tools are needed to identify patients with a predisposition to CVD who can benefit from timely, preventative intervention. With its unique combination of standard lipid markers, lipid fractionation analysis, and novel independent risk factors, the **CV Health Profile** assists physicians in identifying nearly 85% of individuals at risk for cardiovascular disease.

Advanced Markers for Cardiovascular Disease

- **LDL-Particle Number (LDL-P)** includes small and large LDL particles, and is independent of the cholesterol concentration within the particles. An individual with low/normal LDL-C concentration, but high LDL-P, is still at high-risk for plaque build-up. Increased LDL-P is associated with increased risk of carotid atherosclerosis, angina, myocardial infarction and future coronary events.
- **HDL-Particle Number (HDL-P)** indicates increased risk of coronary events for individuals with a low HDL-P number, and is independent of major lipid and non-lipid CVD risk factors. HDL-P is an important secondary risk factor, as it strongly relates to atherosclerosis in those individuals with optimal levels of LDL-P. Increasing HDL-C without increasing HDL-P offers little clinical benefit.
- **LDL-Size** is highly associated with triglycerides and insulin resistance. Individuals with a preponderance of LDL particles of smaller size are at increased risk for coronary artery disease (CAD) and increased CAD severity.
- **Lipoprotein(a) or Lp(a)** is a marker strongly influenced by heredity. It has been cited for its causative role in atherothrombogenesis and its strong association with both coronary and peripheral cardiac events. Lp(a) promotes the deposit of fatty wastes and other debris in atherosclerotic lesions.
- **hs C-reactive protein (hs-CRP)** is an important independent marker for inflammation. High levels reflect over-activity of inflammatory cytokines linked to coagulation and vascular endothelium damage. Elevated hs-CRP has also been linked to a poor long-term prognosis in individuals with a recent history of a cardiac event.
- **Lipoprotein-associated phospholipase (Lp-PLA_2), aka PLAC,** is an enzyme produced in the early stages of atherosclerotic plaque formation. Lp-PLA_2 promotes inflammation and plaque instability, and is a marker specific for vascular inflammation – i.e. it is not affected by common systemic infections or inflammation. Lp-PLA_2 levels reflect atherosclerosis disease activity rather than plaque burden – a significant indicator, given that the majority of heart attacks and sudden coronary deaths are attributable to plaque rupture at sites of only moderate stenosis.
- **Homocysteine** is an amino acid that functions as an intermediate in methionine metabolism. Homocysteine rises with nutritional deficiencies of B12, folate, B6, or riboflavin. High levels of homocysteine are linked to damaged endothelium, increased platelet aggregation, the formation of atherosclerosis, and increased risk of CVD.
- **Fibrinogen** plays a key role in arterial occlusion by promoting thrombus formation, endothelial injury and hyperviscosity.
- **Insulin Resistance Score** is calculated based upon advanced lipid measures by NMR Spectroscopy, evaluating the particle number and size of LDL, HDL, and VLDL sub-fractionation.

- ***Analytes:***
  LDL-C
  HDL-C
  Triglycerides
  Total Cholesterol
  LDL-P
  HDL-P
  LDL-Size
  Lipoprotein (a)
  hs C-Reactive Protein
  Lp-PLA_2
  Homocysteine
  Fibrinogen
  Insulin Resistance Score
    - HDL_L-P
    - LDL_S-P
    - VLDL-P
    - HDL-Size
    - LDL-Size
    - VLDL-Size

- ***Specimen Requirements:***
  - 4 ml serum,
  - 3 ml plasma and
  - 5 ml Z-serum separator

- ***Before Taking This Test, Patients Should:***
  - Fast overnight (at least 12 hours)

Genova Diagnostics®
Innovative Testing for Optimal Health

CV Health

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63 Zillicoa Street
Asheville, NC 28801

Patient: **SAMPLE PATIENT**
DOB: November 25, 1962
Sex: F
MRN:

Order Number:
Completed: October 14, 2009
Received: October 9, 2009
Collected: October 8, 2009

Lipid Markers

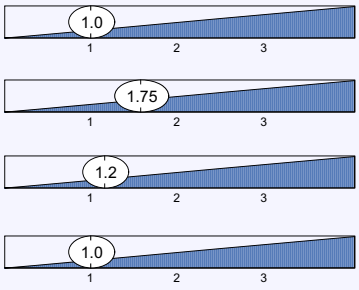
Cholesterol	Result		Reference Range
LDL- Cholesterol	95		< 100 mg/dL
HDL- Cholesterol	48	L	> 49 mg/dL
Triglycerides	147		< 150 mg/dL
Total Cholesterol	158		< 200 mg/dL

Particle Concentration & Size by NMR	Result		Reference Range
LDL-Particle # (LDL-P)	1,050	H	< 1,000 nmol/L
HDL-Particle # (HDL-P)	2.5	L	> 34.9 µmol/L *
LDL-Size	Large (Pattern A):		Small (Pattern B): 20.0
	23.0-20.6 *		20.5-19.0 *
Lp(a)	11		< 30 mg/dL

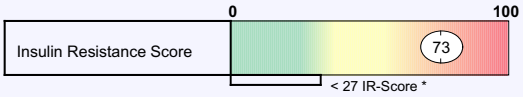
Independent Risk Factors

	Result		Reference Range
hs-CRP	0.89		< 1.00 mg/L
Lp-PLA$_2$ (PLAC)	220	H	< 200 ng/mL
Fibrinogen	343		168-358 mg/dL
Homocysteine	8.81		3.00 - 10.00 µmol/L

Relative Risk for Cardiovascular Disease



Insulin Resistance Score by Lipid Fractionation



The Insulin Resistance Score combines Small LDL-Particle #, LDL Size, Large VLDL-Particle #, VLDL Size, Large HDL-Particle # and HDL Size to assess insulin resistance and diabetes risk.

HDL L	LDL S	VLDL L	HDL Size	LDL Size	VLDL Size
2.5	1,050	4.5	8.4	20.0	47.6
>7.3 µmol/L *	<117.0 nmol/L *	<0.9 nmol/L *	>9.6 nm *	>21.2 nm *	<42.4 nm *

Optimal | Borderline | Abnormal

Percentiles Apply to Biomarkers indicated with * and are performed using NMR technology.

Optimal Either 0-25th or 75-100th percentile based on reference population.
Borderline 25-75th Percentile
Abnormal Inverse of Optimal (0-25th or 75-100th percentile distribution)

The LP(a), hs-CRP, Homocysteine, and Fibrinogen analytes have been approved by the U.S. Food and Drug Administration, and are performed by Genova Diagnostics, Inc.
All other assays are performed by LipoScience, Inc. 2500 Sumner Blvd Raleigh, NC 27616

CVH RMS 4182 Rev 1

Know Your Patient's CVD Risk:

- ***Know their Lipid Particle Number.*** *Recent data indicates that LDL-P is a more accurate assessment of LDL-related risk than LDL-C concentration, and that HDL-P is strongly associated with atherosclerosis, even in individuals with normal LDL-P numbers.*
- ***Know their level of Inflammation.*** *hs-CRP is an independent risk for adverse coronary events in individuals without overt hyperlipidemia, and Lp-PLA$_2$ is a specific marker for vascular inflammation. Increased activity of this intimal-based enzyme promotes plaque instability.*
- ***Know their Insulin Resistance Score.*** *Insulin resistance promotes the inflammation and oxidative stress that drives atherogenesis, and is the ultimate catalyst for glucose intolerance, dyslipidemia, and hypertensive damage.*

For test kits, clinical support, or more information contact:

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More detailed publications with references are also available: www.GDX.net