



Comprehensive Cardiovascular Assessment



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New Malden, Surrey KT3 6NB

63 Zillicoa Street
Asheville, NC 28801 USA

Patient:	Order Number:
DOB:	Completed:
Sex: F	Received:
MRN:	Collected:

CV Factors (Serum)

		Optimal Range
Triglycerides	0.89	<= 1.68 mmol/L
Total Cholesterol	5.61	3.88-5.15 mmol/L
LDL Cholesterol	3.47	<= 2.56 mmol/L
Apo B	0.94	0.53-1.82 g/L

Independent CV Factors (Serum - unless otherwise marked)

		Optimal Range
Lp(a)	1.89	<= 1.04 micromol/L
Homocysteine (Plasma)	26.20	3.70-10.40 umol/L
hs-CRP	1.27	<= 0.99 mg/L
Fibrinogen (Plasma)	12.00	5.82-12.85 micromol/L
HbA1C (Glycosolated Hb) (Whole Blood)	5.0	4.0-5.9 %
HbA1C (Glycosolated Hb) (Whole Blood)	31	20-41 mmol/mol

Protective Factors (Serum)

		Optimal Range
HDL Cholesterol	1.73	>= 1.03 mmol/L
Apo A-1	1.74	1.01-2.23 g/L

Ratios

		Optimal Range
Total Cholesterol / HDL	3.2	<= 3.7
Apo B / Apo A-1	0.54	0.30-0.90

Commentary

National Cholesterol Education Program Guidelines (NIH Publication No. 01-3670, May 2001)

<i>Total Cholesterol Levels</i>		<i>HDL- Cholesterol Levels</i>	
Less than 5.17 mmol/L	"Desirable" level that puts you at lower risk for heart disease. A cholesterol level of 5.17 mmol/L or greater increases your risk.	Less than 1.03 mmol/L	A major risk factor for heart disease.
5.17 to 6.18 mmol/L	"Borderline High"	1.03 to 1.54 mmol/L	The higher your HDL, the better.
6.21 mmol/L and above	"High" blood cholesterol. A person with this level has more than 2X the risk of heart disease compared to someone whose cholesterol is below 5.17 mmol/L.	1.55 mmol/L and above	A HDL of 1.55 mmol/L and above is considered protective against heart disease.
<i>LDL- Cholesterol Levels</i>		<i>Triglyceride Levels</i>	
Less than 2.59 mmol/L	Optimal	Less than 1.69 mmol/L	Normal
2.59 to 3.35 mmol/L	Near Optimal/Above Optimal	1.69 to 2.25 mmol/L	Borderline High
3.36 to 4.13 mmol/L	Borderline High	2.26 to 5.63 mmol/L	High
4.14 to 4.89 mmol/L	High	5.64 mmol/L or above	Very High
4.90 mmol/L and above	Very High	The HDL, LDL and Total Cholesterol categories apply to adults age 20 and above.	

The reference range for the biomarker Homocysteine is based on the sex-specific 5th to 95th percentile values for men and women (20 to 39 years of age) in the NHANES nutritionally replete cohort. *Annals of Internal Medicine* 1999; 141 (331-338).

Commentary is provided to the practitioner for educational purposes, and should not be interpreted as diagnostic or treatment recommendations. Diagnosis and treatment decisions are the responsibility of the practitioner.

The **Triglyceride** level is WITHIN the REFERENCE range. Since triglycerides are a strong risk factor, normal levels are associated with decreased risk of cardiovascular disease and reflect a protective status of this patient's lipid and biochemical make-up.

Total **Cholesterol** is in the MODERATE risk range for this individual. Although cholesterol does have important structural and metabolic roles, levels in this range indicate a potential need for cholesterol reduction. Generally speaking, the higher the cholesterol, the higher the cardiovascular risk, particularly with younger-aged people. Exercise and dietary influences on total cholesterol are substantial and may be key areas to consider.

HDL cholesterol is found to be in the PROTECTIVE range. This elevated HDL reflects a degree of cardioprotection. This is due to an enhanced ability for scavenging of excess cholesterol from the cells, thus preventing accumulation

Commentary

in the vascular smooth muscle or endothelium. High HDL exerts a positive influence even with moderate elevations in LDL or total cholesterol levels.

Apolipoprotein A-1 is WITHIN the REFERENCE range. As a component of HDL cholesterol, Apo A-1 is associated with a protective effect regarding cardiovascular risk. Levels of this marker typically correlate with the HDL level, so any variation from this pattern may be of note. Normal Apo A-1 is particularly auspicious in adolescents with a family history of MI or other cardiovascular disease, as low levels have been shown to be good predictors of future risk.

Apolipoprotein B is WITHIN the REFERENCE range. Since Apo B is a key component of LDL cholesterol, normal levels denote a good dietary and metabolic control of LDL activity. Levels of this marker typically correlate with the LDL level, so any variation from this pattern may be of note. Apo B can be a good predictor of premature atherosclerotic processes, so that a normal level provides a measure of confidence that these processes are not proceeding in an accelerated manner.

LDL cholesterol is in the HIGHER RISK range. This indicates an increased risk for cardiovascular pathology for this patient. Long-term studies show that elevated LDL is the strongest predictor of MI occurrence in addition to associations with coronary artery disease and atherosclerosis. Significantly elevated LDL levels are important to address in the context of other risk factors and may be modified via nutritional, lifestyle and pharmacological strategies.

Lipoprotein(a) [Lp(a)] is ABOVE the OPTIMAL level. Elevated Lp(a) has received much attention as a key genetic component for cardiovascular risk. Lp(a) has the capacity to encourage persistence and growth of fibrin clots while also promoting fatty deposits on endothelial surfaces. Elevated serum Lp(a) levels can also be an accurate indicator of risk for cerebral infarction. There are therapeutic strategies capable of modifying Lp(a) levels, so although levels are genetically determined, positive changes may be attained. The methodology utilized for Lp(a) detection on this profile produces accurate and reproducible results. The comprehensive cardiovascular 2.0 methodology offers increased sensitivity for Lp(a) detection.

The **homocysteine** level is ABOVE the REFERENCE range. Homocysteinemia has received abundant regard as a key independent risk factor for cardiovascular disease which is responsive to nutritional intervention. Elevated homocysteine levels result in micro-abrasive effects on the vascular endothelium, thus providing loci for other plaque-generating events to occur. Smoking and hypertension increase cardiovascular risks associated with high homocysteine.

High-sensitivity C-reactive Protein (hs-CRP) is above the optimal range. hs-CRP is an independent risk factor for cardiovascular disease. Elevated levels of hs-CRP are associated with an increased risk of myocardial infarction and stroke, as well as in periodontal disease, systemic inflammatory diseases, and dementia. Acute elevations of hs-CRP can occur with fever, inflammation and viral or bacterial infections, so these factors should be noted at the time of sample collection. Components of chronic inflammatory processes include: IL-6 polymorphisms and chronic infections from Chlamydia pneumoniae, CMV, nanobacteria and Helicobacter pylori.

Fibrinogen is WITHIN the REFERENCE range. Fibrinogen is one of the participants in the clotting process and is manufactured by the liver. As fibrinogen is associated with increased cardiovascular risk via enhancement of coagulation and increased blood viscosity, such normal levels are desirable to maintain.

The **ratio of Total Cholesterol to HDL cholesterol** is within the OPTIMAL range. This ratio is part of the larger picture relating to cardiovascular risk, and implies a measure of cardioprotective influence.

Apo B / Apo A-1 ratio is in the OPTIMAL range, suggesting cardioprotection. This ratio is regarded as an important component of cardiovascular risk, the apolipoproteins being a more refined gauge of risk than HDL & LDL levels.