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Name: Doe, John

DOB: February 23, 1946

Physician: Cardiology, M.D.

Reference: ihared\Lab\LPP\Camera\Unit 1\L75562. 0.0500

Batch: B5853

Accession No: L75012

Draw March 7, 2013

Report Date: March 14, 2013

Lipoprotein Particle Numbers

Green - Normal

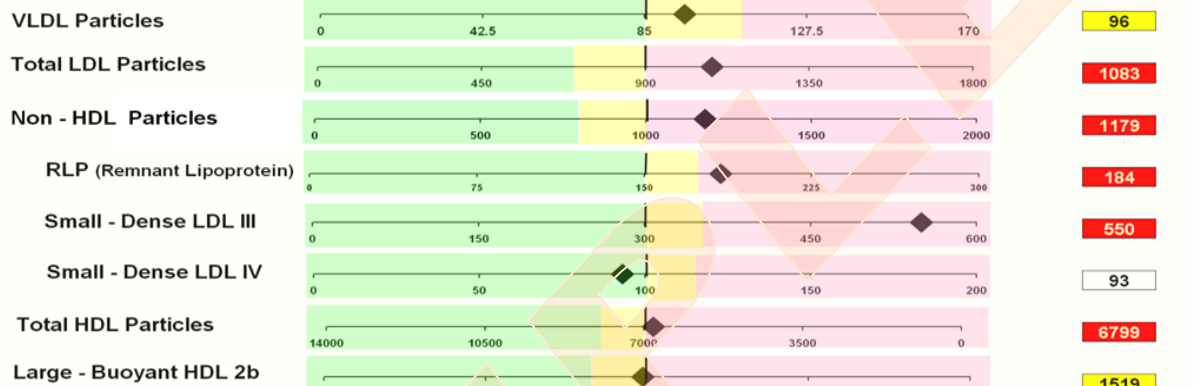
Yellow - Borderline

Red - Abnormal

Patient Results

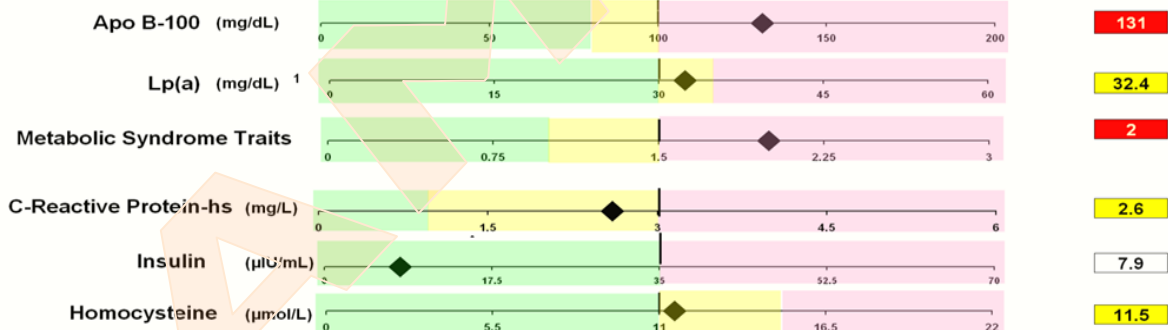
Reference Value

Values in (nmol/L)



Biomarkers and Risk Factors

Patient Results



Lipid Panel

Values in (mg/dL)



Comments:

1. Reference Value for Blacks is 50.0 mg/dL

Clinical Interpretation Guide to the LPP™ Test

Step 1. Primary Risk Assessment

- Lipoprotein non-HDL particle numbers and other lipid and non-lipid risk factors may show a greater patient risk than a standard lipid panel and therefore, a greater LDL reduction than indicated by a standard lipid panel. Non-HDL lipoprotein particle numbers and/or Apo B-100 are measures of the number of atherogenic lipoprotein particles and are compliant with the recent consensus statement from the American Diabetes Association and the American College of Cardiology¹ stating that lipoprotein particle numbers are more predictive of CVD risk than cholesterol.
- Moderate to elevated triglycerides can cause the lipoproteins to be cholesterol depleted or triglyceride enriched and these patients will show a greater CVD risk from non-HDL particle numbers or Apo B-100 than from a standard lipid panel. This occurs in about 30% of the population.

Step 2. Modify Risk Using Metabolic Syndrome Traits, Lp(a) and Inflammation Risk Markers

- Evaluate possible Metabolic Syndrome by combining the lipid traits from the LPP™ test with possible hypertension, obesity and high glucose. Three total traits is a diagnosis of Metabolic Syndrome and raises the CVD risk to the next level. Also check for insulin resistance using the LPP™ fasting insulin value.
- Take into account additional risk from elevated Lp(a) or inflammation markers such as hs-CRP or Lp-PLA2 if ordered, in determining the final treatment goals. Also consider non-lipid risk factors such as hypertension, obesity, high glucose, smoking, family history and other medical history.
- The risk assessment and treatment goal from **Step 1** should be adjusted in light of the presence of these additional Biomarkers and Risk Factors.
- A standard directly measured cholesterol **Lipid Panel** is presented at the bottom of the report for comparison to previously determined lipid results.

Step 3. Determine Therapeutic Approach Based On the Lipid Subgroup Distribution, Lp(a) and Therapeutic Guidelines

- Using the risk level established in **Step 2** and treatment goals from the NCEP guidelines, determine if VLDL, LDL subgroups, HDL subgroups and/or Lp(a) should be therapeutic targets.
- The LPP™ particle numbers by subgroup and Lp(a) each have a specific therapeutic approach that is most effective. Often, combination therapy is needed to address the different risk areas.
- A special HDL species enriched in Apo C-I is atherogenic but displays health attributes². It is generally identified by high HDL > 70 mg/dL, high HDL 2b > 4000 nmol/L with a high HDL peak or hump extending into LDL IV region and low TG's < 70 mg/dL. Check for CVD development with a CIMT, a Coronary Calcium Score or other method to confirm.
- Refer to the **LPP™ Therapeutic Guidelines** for lipoprotein subgroup specific information.

1. Diabetes Care, Volume 31, Number 4, April 2008

2. Kwiterovich P, et al. JAMA 2005; 293(15): 1891

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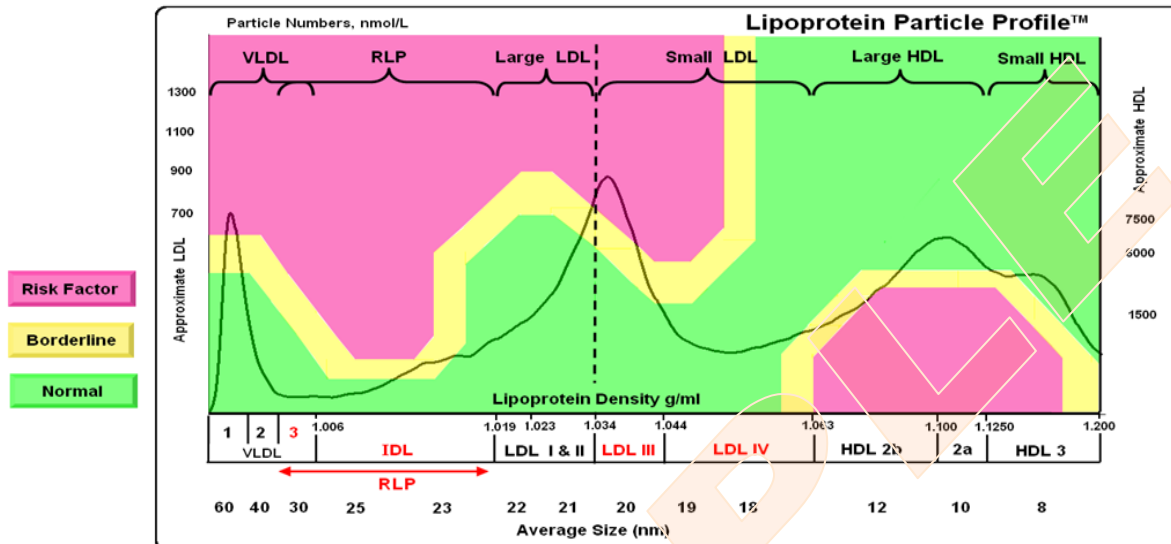
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Lipoprotein Particle Numbers (nmol/L)

	Value	Reference Value	Alert (Notes Page 3)
VLDL Particles	96	<85	Borderline High (12)
Total LDL Particles	1083	<900	High (13)
Non - HDL Particles	179	<1000	High (19)
RLP (Remnant Lipoprotein)	184	<150	High (14)
Small - Dense LDL III	550	<300	High (15)
Small - Dense LDL IV	93	<100	
Total HDL Particles	6799	>7000	Low (17)
Large - Buoyant HDL 2b	1519	>1500	Borderline-M, Low-F (18)

Biomarkers and Risk Factors

	Value	Reference Value	Alert (Notes Page 3)
Apo B-100 (mg/dL)	131	40 - 100	High (20)
Lp(a) (mg/dL)	32.4	6.0 - 29.9 ¹	Borderline (6)
Metabolic Syndrome Traits	2	Zero	Probable (8)
C-Reactive Protein-hs (mg/L)	2.6	<3.0	Borderline (9)
Insulin (uIU/mL)	7.9	4.0 - 35.0	
Homocysteine (umol/L)	11.5	<11.0	Borderline High (11)

Lipid Panel (mg/dL)

	Value	Reference Value	Alert (Notes Page 3)
Total Cholesterol	197	<200	
LDL - Cholesterol	124	40 - 130	Borderline High (2)
HDL - Cholesterol	42	>40	Borderline (3)
Triglycerides	157	30 - 150	Borderline High (4)
Non - HDL- Chol (calc)	155	<160	Borderline (5)

1. Reference Value for Blacks is 50.0 mg/dL

SpectraCell Clinical Suggestions for Alert References			
1	Elevated Total Cholesterol (TC): Borderline 200-240 mg/dL consider treatment when patient has 2 or more risk factors. High >240 mg/dL consider treatment after assessing secondary dyslipidemia. >300 mg/dL suggest higher likelihood of genetic causation.		
2	Elevated LDL-Cholesterol (LDL-C): Follow ATPIII Guidelines for treatment goals and strategy: See online at http://www.nhlbi.nih.gov/guidelines/cholesterol/atglance.htm		
	0-1 Risk factors: Goal <160 mg/dL	2 Risk factors: Goal <130 mg/dL	High Risk/ CHD or CHD equivalent Goal: <100 mg/dL (or 70 mg/dL)
3	Low HDL-Cholesterol (HDL-C): Follow ATPIII Guidelines for treatment goals and strategy: See online at http://www.nhlbi.nih.gov/guidelines/cholesterol/atglance.htm		
	Males: <40 mg/dL (is 1 of 5 traits for Metabolic Syndrome)	Females: <50 mg/dL (is 1 of 5 traits for Metabolic Syndrome)	
4	Elevated Triglycerides (TG): TG >150 mg/dL is 1 of 5 traits for Metabolic Syndrome. (Triglyceride levels can be elevated if patient is non-fasting.) Follow ATPIII Guidelines for treatment goals and strategy: See online at http://www.nhlbi.nih.gov/guidelines/cholesterol/atglance.htm		
	Borderline: 150-199 mg/dL	High: 200-499 mg/dL	Very High: 500 mg/dL Consider Genetic disorders.
5	Non-HDL-C: A cholesterol measurement that predicts risk better than LDL-C per the ACC & ADA consensus statement.		
	Optimal: <130 mg/dL	Borderline Risk : 130-160 mg/dL	High Risk: >160 mg/dL
6	High Lp(a): (Lp(a) >30.0): Lp(a) is highly associated with cardiovascular disease. Lp(a) is an inherited trait and does not respond to diet, exercise, or statin drugs. Treatment for high Lp(a) is typically niacin and aggressive LDL treatment.		
7	High Lp-PLA2: (200 to 235 mg/L borderline, > 235 mg/L elevated): Is associated with a two fold increased cardiovascular risk.		
8	Metabolic Syndrome Traits: This test reports only 2 of the 5 traits associated with the ATPIII Metabolic Syndrome Definition: Elevated TG (>150 mg/dL), Low HDL-C (<40 mg/dL in men; <50 mg/dL in women). Additionally, this number adds a third feature (elevated numbers of LDLIII and LDLIV particles) which corresponds highly to metabolic syndrome/insulin resistance. Clinicians must confirm metabolic syndrome by adding values for waist circumference, fasting blood glucose and blood pressure. See ATPIII guidelines.		
9	C-Reactive Protein (hs-CRP): Marker of Inflammation tied to increased cardiovascular risk		
	Low Risk: 0-1 mg/L	Borderline: 1-3 mg/L	High: >3 mg/L
10	Elevated Insulin: (Insulin > 35.0 uIU/mL): High fasting insulin is associated with increased cardiovascular risk and/or metabolic syndrome. Test units may not correlate to other labs using different methods. Insulin levels can be elevated if patient was non-fasting. Confirm that patient was properly fasted before setting goals.		
11	Elevated Homocysteine: Intermediate in methylation pathways- risk factor for CVD, stroke, Alzheimers and osteoporosis		
	Desirable: <11 nmol/L	Borderline: 11-15 nmol/L Consider dietary changes and/or multivitamins/ B-complex supplements.	Elevated: Above 15 nmol/L Consider dietary changes and/or multivitamins/ B-complex supplements.
12	High VLDL Particle Number (VLDL > 85 nmol/L): No reported clinical guidance by NCEP, however this correlates to triglyceride values of over 200 mg/dL, high RLP and possible metabolic syndrome.		
13	Borderline, High to Very High LDL Particle Number (LDL > 700, 900, 1100 nmol/L): Patients with 2 or more risk factors are recommended to initiate therapeutic lifestyle changes and/or drug therapy to lower LDL < 900nmol/L. Patients with CHD or CHD equivalents are recommended to begin LDL-lowering drug therapy to LDL <700nmol/L. All patients with LDL particle numbers greater than 1100 nmol/L are recommended to be treated aggressively.		
14	Elevated Remnant Lipoprotein Particle Number (RLP >150 nmol/L): This new NCEP risk factor has been shown to be highly correlated with CHD and should be monitored along with other risk factors during lifestyle, supplement and/or drug treatment. Omega-3 fatty acids have been shown to reduce triglycerides and RLP.		
15	Borderline to High LDL III Particle Number (LDL III>300 nmol/L): Indicates an abundance of small-dense atherogenic LDL-particles. Management should be considered depending on LDL-C goals and risk factors. Reducing LDL-C and TG often will lower dense-LDL particles.		
16	Elevated LDL IV (LDL IV> 100 nmol/L): Indicated abundance of very small-dense atherogenic particles. Lp(a) is found typically between d=1.05 and d=1.08 and often is located in the range for LDL IV. Treatment for high LDL IV and Lp(a) are very similar, typically niacin and aggressive LDL-C reduction.		
17	Low HDL particle count <7000 nmol/L, 7000 - 8000 nmol/L is Borderline for Males and Low for Females: Indicates potential for atherogenic dyslipidemia. Beneficial therapies similar to those which raise HDL-C and reducing elevated TG (diet, exercise, niacin, omega-3's)		
18	Risk Factor for HDL2b between 1500 and 1750 nmol/L is borderline for males and risk factor for females. Values less than 1500 is a risk factor for males: Indicates that the HDL reverse transport system is not working well to remove excess cholesterol.		
19	Non-HDL Particle Numbers: Non-HDL particle numbers is the best overall indicator of CVD risk.		
	Optimal: <800 nmol/L	Borderline Risk : 800-1000 nmol/L	High Risk: >1000 nmol/L
20	ApoB: A measure of all non-HDL particle numbers.		
	Optimal: <80 mg/dL (goal for very high risk patients)	Borderline Risk: 80-100 mg/dL	High Risk: >100 mg/dL