bostonheart diagnostics®

FINAL REPORT

Patient
Name: SAMPLE, REPORT
DOB: 12.11.1992 Gender: M
Patient ID: 166667 Fasting: Yes
ACC/AHA Risk Score: BMI:
Patient Info:

Provider
Provider: ERNST SCHAEFER MD
175 Crossing Blvd
Framingham, MA 01702

Account No: 130

Specimen
Accession No: T0331626
Requisition No:
Report Date & Time: 12.11.2025 12:45 PM
Received Date & Time: 12.11.2025 12:32 PM
Collection Date & Time: 12.11.2025 12:31 PM

CVMap + Metabolics

Lipids and Apolipoproteins

Test Name	Optimal	Borderline	Increased Risk	Footnotes	Previous Results
Total Cholesterol	188			10	
	<200	200-240	>240 mg/dL		
Direct LDL-C		127		10	
	<100	100-160	>160 mg/dL		
HDL-C			36	10	
	>50	40-50	<40 mg/dL		
Triglycerides		151		10	
	<150	150-200	>200 mg/dL		
Non-HDL-C		152		10	
	<130	130-190	>190 mg/dL		
ApoB			121	10	
	<80	80-120	>120 mg/dL		
sdLDL-C		49		10	
	<25	25-49	>49 mg/dL		
VLDL-C	25			10	
	<30	30-40	>40 mg/dL		
Lp(a)			54	10	
	<30	30-50	>50 mg/dL		
ApoA-I		147.0		10	
	>160	120-160	<120 mg/dL		

Lipid Ratios

TC/HDL-C		5.2			
	<4	4-6	>6		
VLDL-C/TG	0.17				
	<0.2	0.2-0.3	>0.3		
ApoB/ApoA-I		0.82			
	<0.6	0.6-0.9	>0.9		
HDL-C/TG			0.24		
	>0.5	0.25-0.5	<0.25		

Boston Heart Cholesterol Balance® Test[1]

Normalized Value (µmol x 100/mmol of Total Cholesterol)
Absolute Value (mg/L)

	Normalized Value	Absolute Value	Footnotes
Production Markers: HIGH			
Lathosterol (85 / 125)	333	6.3	
Desmosterol (65 / 75)	108	2.0	
Absorption Markers: LOW			
Beta-sitosterol (115 / 155)	73	1.5	
Campesterol (170 / 230)	91	1.8	

Cholesterol Balance Score (Production/Absorption) **3.5**

Over Absorber (0.2 / 0.5 / 1.1) Over Producer

Interpretation: Elevated levels of Lathosterol and Desmosterol may indicate an increased cellular production of cholesterol. Cholesterol Balance Score is very HIGH and consistent with markedly increased cholesterol production.

Consideration: Consider lifestyle modification and statin therapy.

Inflammation and Oxidation Tests

Test Name	Optimal	Borderline	Increased Risk	Footnotes	Previous Results
hs-CRP		2.2		10	
	<1.0	1.0-3.0	>3.0 mg/L		
$LpPLA_2$ Activity	173			10	
	<180	180-224	≥225 nmol/min/mL		

Interpretation: BORDERLINE hs-CRP may indicate inflammation and may be associated with increased CVD risk.

Consideration: Consider evaluating potential contributing CVD risk factors. Identify and treat underlying causes such as atherogenic lipoproteins and metabolic markers. If indicated, control blood pressure, encourage smoking cessation and weight reduction.

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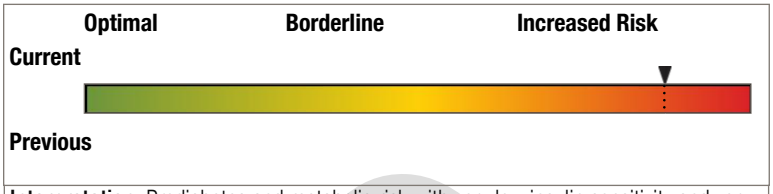
Metabolic Tests

Test Name	Optimal	Borderline	Increased Risk	Footnotes	Previous Results
HbA1c		6.1		10	
	<5.7	5.7-6.4	>6.4 %		
Glucose[2]		116		10	
	70-99	100-125	<70 or >125 mg/dL		
Insulin[3]			35	9,10	
	<10	10-15	>15 µU/mL		
C-Peptide[3]			4.28	10	
	<3.0	3.0-4.0	>4.0 ng/mL		
HOMA-IR			10.0		
	<2	2-3	>3		
HOMA-S			10.0		
	>50.0	33.3-50.0	<33.3		
HOMA-B			238		
			%		

Interpretation: BORDERLINE glucose and HbA1c indicates prediabetes as established by the ADA. Prediabetes is a major risk factor for metabolic syndrome and has been associated with increased risk of developing diabetes, hyperlipidemia, hypertension and CVD. **Based on the HbA1c value, the estimated Average Glucose (eAG) is 128 mg/dL which includes the non-fasting state.**

Consideration: Consider encouraging dietary modification supported by education and consider glucose lowering and/or insulin sensitizing medications. If indicated encourage weight reduction, smoking cessation, increased activity and control blood pressure.

Boston Heart Beta Cell Function and Risk Index



Interpretation: Prediabetes and metabolic risk with very low insulin sensitivity and very elevated beta cell activity. Beta cell risk is in the 87th percentile.

Consideration: Consider weight loss, exercise, and/or metformin to increase insulin sensitivity. For elevated beta cell activity (HOMA-B), consider limting refined carbohydrates such as sugars and starches to reduce insulin demand.

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Test Name	12.11.2025 (Most Recent)
Lipids and Apolipoproteins	
Total Cholesterol	188
Direct LDL-C	127
HDL-C	36
Triglycerides	151
Non-HDL-C	152
ApoB	121
sdLDL-C	49
VLDL-C	25
Lp(a)	54
ApoA-I	147.0
Lipid Ratios	
TC/HDL-C	5.2
VLDL-C/TG	0.17
ApoB/ApoA-I	0.82
HDL-C/TG	0.24
Boston Heart Cholesterol Balance® Test[1]	
Lathosterol	333
Desmosterol	108
Beta-sitosterol	73
Campesterol	91
Inflammation and Oxidation Tests	
hs-CRP	2.2
$LpPLA_2$ Activity	173
Metabolic Tests	
HbA1c	6.1
Glucose[2]	116
Insulin[3]	35
C-Peptide[3]	4.28
HOMA-IR	10.0
HOMA-S	10.0
HOMA-B	238
Chemistry Tests	
Glucose[2]	116

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Treatment Consideration Summary

The intended use of this report is to provide an aid in the physician's treatment decisions. This report is intended for a physician or other qualified health care provider. Please consult with your physician regarding any questions.

	Lifestyle and Dietary Modification	Statins	Fibrates	Glucose Lowering and/ or Insulin Sensitizing Medications	Omega-3 Fatty Acids	Aspirin	Soluble Fiber Supplements	Bile Acid Sequestrants
Lipids								
LDL-C	•	•	•				•	•
HDL-C	•	•	•		•			•
Triglycerides	•	•	•		•		•	
Non-HDL-C	•	•	•		•			•
ApoB	•	•	•					•
sdLDL-C	•	•	•		•		•	
Lp(a)						•		
ApoA-I	•	•						
Cholesterol Balance Test								
Production Markers	•	•						
Inflammation Tests								
hs-CRP	•	•			•			
Metabolic Tests								
HbA1c	•			•				•
HOMA-IR	•			•				
Glucose	•			•			•	•
Insulin	•			•				
C-Peptide	•			•				

Lifestyle and Dietary Modification

Therapeutic lifestyle change is the cornerstone for reducing risk for Cardiovascular Disease (CVD) and diabetes.

The following recommendations are based on the American Heart Association's dietary and lifestyle guidelines. Consume a dietary pattern that achieves ≤6% of calories from saturated fat and emphasizes intake of vegetables, fruits and whole grains; includes low-fat dairy products, poultry, fatty fish, legumes, non-tropical vegetable oils and nuts; and limits intake of refined grains, sweets, sugar-sweetened beverages and red meats. Eliminate foods high in trans fat.

If indicated: control blood pressure, **reduce weight**, engage in smoking cessation and **be physically active** — work up to getting at least 30 minutes of a moderate intensity physical activity, at least 5 days per week.

- Elevated production markers indicate an increased cellular production of cholesterol which may be associated with obesity and metabolic syndrome. Therapeutic lifestyle changes focus on LDL-C reduction through weight loss and decreased intake of animal fat, refined carbohydrates, sweets and sugar-sweetened beverages.
- To increase ApoA-1, HDL-C and to decrease ApoB, non-HDL-C, LDL-C levels it is important to reduce saturated fat intake, refined carbohydrates, sugars and eliminate trans fats.
- To lower small dense LDL-C and triglycerides reduce intake of simple carbohydrates and alcohol and if indicated reduce weight and increase physical activity. An elevation in small dense LDL-C is often associated with metabolic syndrome. Triglycerides are utilized for fat storage or for energy. Elevated levels may increase CVD risk by altering lipoprotein metabolism by increasing the formation of small dense LDL particles and lowering levels of large HDL particles.
- To optimize glucose, HbA1c, insulin, C-Peptide, HOMA-IR, and reduce risk of diabetes and CVD it is important to reduce weight and simple carbohydrate intake.

Statins

According to studies, statins have been shown to reduce cholesterol production, increase LDL clearance and lower the risk of CVD and its progression. Statins can lower CoQ10 levels.

Statins:
- may be effective in reducing cholesterol production and LDL cholesterol levels but also may increase absorption of cholesterol.
- may raise HDL-C by 5-10%; may lower LDL-C by 30-60%; may lower non-HDL cholesterol; may decrease triglycerides by 10-50%. Triglycerides are utilized for fat storage or for energy. Elevated levels increase CVD risk and alter lipoprotein metabolism by increasing the formation of small dense LDL particles and lowering levels of large HDL particles.

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Report Interpretation (continued)

Statins (continued)

• may raise ApoA-1; may lower ApoB; ApoA-1 is the primary protein on each HDL particle. ApoB is the primary protein on non-HDL lipoproteins and is a direct measure of the number of atherogenic lipoproteins.
• may lower small dense LDL significantly especially in patients with elevated triglycerides. According to studies, small dense LDL is believed to be more atherogenic than larger, more buoyant LDL particles.
• lowering CRP with statin therapy has been shown to lower CVD events. Elevated CRP may indicate inflammation and CVD risk.

Fibrates

For patients unable to tolerate statins consider fibrate therapy.

Fibrates:
• may lower triglycerides 23-54%; may modestly lower LDL-C by 20-31%; provide a modest increase in HDL-C by 5-15%; may lower non-HDL cholesterol.
• may lower ApoB; may modestly reduce small dense LDL.

Glucose Lowering and/or Insulin Sensitizing Medications

Insulin sensitizers increase glucose uptake in muscle cells and adipocytes. Glucose stabilizing medications have been shown to help to lower blood sugar.

• Glucose lowering and insulin sensitizing medications may lower glucose, HbA1c, insulin, C-Peptide, HOMA-IR.
• Homeostasis Model Assessment of Insulin Resistance (HOMA-IR) is the standard measure of insulin resistance based on both fasting insulin and glucose levels; according to studies, C-Peptide is an accurate measure of endogenous insulin production, even in patients receiving insulin therapy.

Omega-3 Fatty Acids

Studies have shown that Omega-3 Fatty Acids are essential to heart health. Their benefits may include improved cholesterol balance, improved immune system function, reduced inflammation and reduced rates of heart disease.

Omega-3 Fatty Acids:
• may modestly increase HDL-C; may modestly decrease non-HDL-C; reduce plasma triglycerides by about 25-50% resulting primarily from the decline in hepatic very low density lipoprotein (VLDL- TG) production and secondarily from the increase in VLDL clearance.
• may lower small dense LDL-C.

Aspirin

Consider low dose aspirin after risk benefit analysis including contraindications and clinical correlation.

Aspirin:
• according to studies may reduce the risk of clot associated with Lp(a) elevations.

Soluble Fiber Supplements

Soluble fiber works by decreasing cholesterol absorption in the gut by increasing LDL receptor expression in the liver. Consider a soluble fiber supplement such as guar gum, psyllium, pectin and glucomannan.

• Soluble fiber may lower blood glucose.

Bile Acid Sequestrants

Bile Acid Sequestrants (BAS), according to studies, bind bile acids in the intestine, causing more liver cholesterol to be converted to bile acids and decreasing availability of cholesterol to build bile acids. This process upregulates LDL receptors and increases LDL clearance.

Bile Acid Sequestrants:
• may lower ApoB up to 12%; may increase HDL 3-5%; may lower LDL-C up to 20%; may lower non-HDL cholesterol.
• may modestly decrease blood glucose; may decrease HbA1c up to 0.5%.

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Footnotes

The intended use of this report is to provide an aid in the physician's treatment decisions. This report is intended for a physician or other qualified health care provider. Please consult with your physician regarding any questions.

[1]This test was developed and its performance characteristics determined by Boston Heart Diagnostics. It has not been cleared or approved by the U.S. Food and Drug Administration (FDA). The FDA has determined that such clearance is not necessary. This test is used for clinical purposes. It should not be regarded as investigational or for research. Methods: HDL Map: Gel electrophoresis; Cholesterol Balance and Fatty Acid Balance: GC/MS; MPO: Immunoturbidometric; CoQ10: UPLC/UV; Adiponectin: Latex turbidimetric immunoassay; Aldosterone: Chemiluminescent immunoassay; LDL-P, HDL-P, LipoMap and Serum MetaboMap: NMR; TMAO: LC/MS/MS; Dried Blood Spot Testing.

[2]A fasting glucose level of >125 mg/dL indicates the presence of diabetes mellitus, and a fasting glucose level of <70 mg/dL indicates hypoglycemia.

[3]A test result in the low range is normal in a non-diabetic, but low if a patient has diabetes (consistent with diabetes).

[4]Genetic analysis is performed by real time Polymerase Chain Reaction (PCR) using TaqMan® probes. Amplified gene nucleotide sites: APOE - Apolipoprotein E, T471C rs429358, C609T rs7412; F5 - Coagulation Factor V, G1746A rs6025; F2 - Coagulation Factor 2, G20210A rs1799963; CYP2C19 (Clopidogrel response) -Cytochrome P450 2C19, G681A rs4244275, G636A rs4986893, C-806T rs12248560; SLCO1B1 (Statin Myopathy) - Solute Carrier Organic Anion Transporter Family, Member 1B1, T625C rs4149056. MTHFR – Methylenetetrahydrofolate reductase, C677T rs1801133, A1298C rs1801131. Limitations: Other rare mutations not detected by these assays may be present in some individuals. Recommendation: Genetic counseling with discussion of testing for other family members is recommended.

[9]High doses of biotin (>5mg/day) may interfere with assay results. Patient assumed to be refraining from biotin supplementation for at least 3 days prior to blood draw.

[10]Testing performed by Eurofins Ascend Clinical 435 Oakmead Parkway, Sunnyvale, CA 94085 CLIA# 05D0592241.

* Tests performed with alternative methodologies are not displayed for comparative purposes.

▲ = Critical Value, ⚠ = Alert Value, TNP = Test Not Performed, PEND = Test Result Pending, GSP = Glycated Serum Protein, ADA = American Diabetes Association

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