



# Curated CVD & Diabetes Prevention Profiles

Boston Heart is proud to offer 2 levels of curated profiles for prevention of cardiovascular disease (CVD) and type-2 diabetes, or complication of these conditions. These profiles are excellent for monitoring patients with obesity, insulin resistance, metabolic syndrome, pre-diabetes, or diabetes. Such patients are at a 2 to 4 times higher risk for CVD than patients without these conditions.

Cardiovascular disease, type 2 diabetes, metabolic syndrome, and obesity are widespread and very common among patients. These lifestyle diseases are largely preventable, treatable, and reversible. The right combination of blood tests can unmask and monitor risk for serious health problems including premature death and dramatically reduced quality of life.

## Clinical Utility

### Advanced Lipid Testing

Routine lipid testing is insufficient to identify and monitor patients at risk adequately. Small Dense LDL-C, apoB, Lp(a), cholesterol production and absorption, fatty acids and HDL metabolism are all important for uncovering and treating hidden risk

### Metabolics

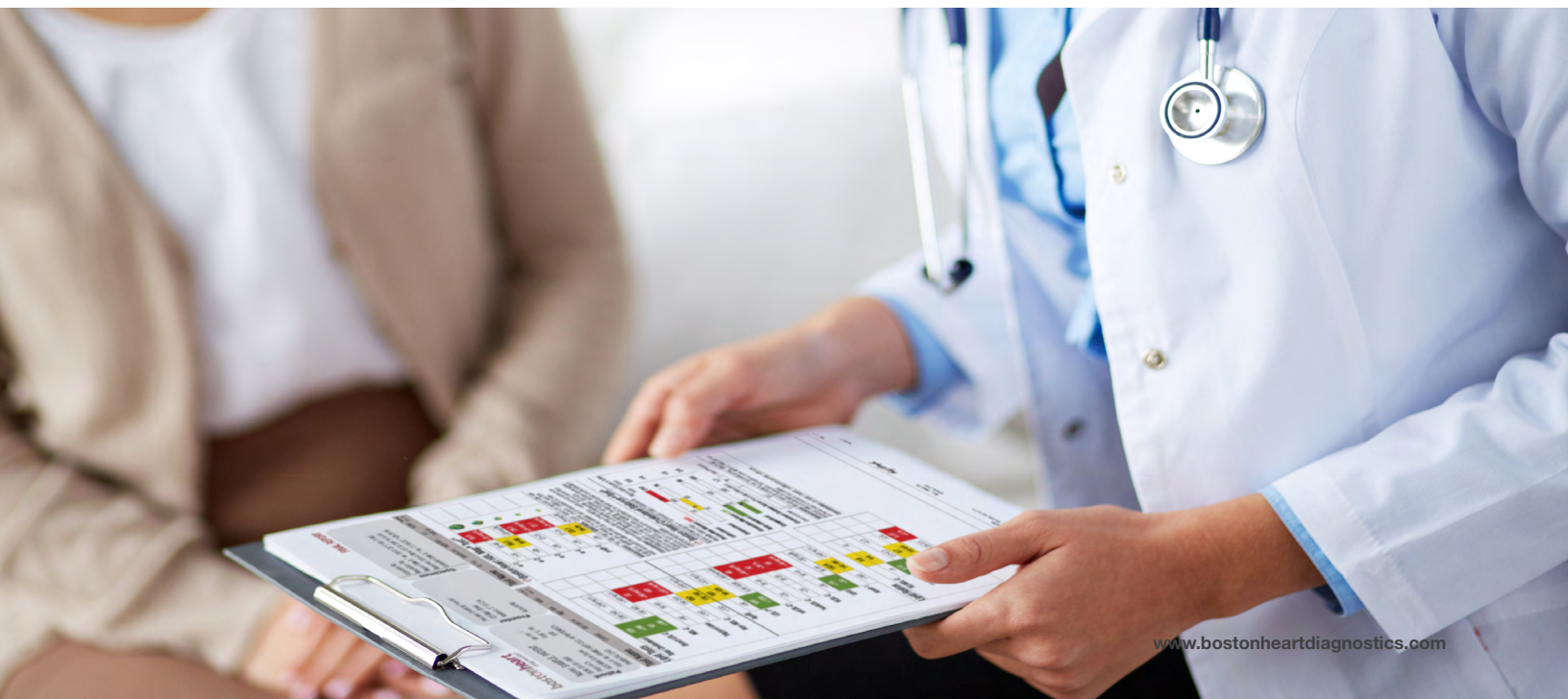
Obesity, insulin resistance, metabolic syndrome, prediabetes, and type-2 diabetes are widespread epidemics. Cardiovascular disease is the leading cause of death in patients with these conditions. Monitoring glucose and HbA1c are crucially important for prevention, early identification, treatment, and reversal of type-2 diabetes and cardiovascular risk. These profiles go a step further by evaluating insulin levels, calculated insulin resistance & sensitivity, calculated beta cell activity, and the Boston Heart Beta Cell Function and Risk Index™. Together these tests can evaluate the potential role of specific therapies to address insulin resistance and/or beta cell dysfunction.

## Inflammation

Atherosclerosis is an inflammatory disease which affects all patients with diabetes. After ruling out other causes of inflammation, C-reactive protein (CRP) is a strong independent predictor of CVD. Lowering CRP with statins in patients with normal LDL-C reduces CVD events. LpPLA<sub>2</sub> measures inflammation specific to oxidized cholesterol plaque in the artery wall and reflects overall atherosclerotic burden. Oxidized phospholipid on apoB particles (OxPL-apoB) is highly pro-inflammatory and levels can be used to reclassify patients into higher or lower risk categories allowing for better personalized care. Inflammation can be reduced by treating the underlying causes including abnormal lipids, glucose, blood pressure, smoking, processed food and low physical activity. Furthermore, randomized trials indicate that patients with diabetes who have increased oxidation due to the haptoglobin variant Hp2/2 reduce CVD risk with natural vitamin E supplementation.

## Chemistries

Electrolytes, kidney function, liver function and other measures of normal metabolic activity are valuable tools for health assessment and patient management. Homocysteine, uric acid, and vitamin D are each associated with CVD risk and can be improved with healthy lifestyle choices. When deficiencies are detected, it is important to understand the underlying cause to determine whether supplementation is appropriate to normalize levels.





## PROFILE COMPARISON

BIOMARKER NAME	CVD & DIABETES PREVENTION	CVD & DIABETES PREVENTION COMPREHENSIVE	BIOMARKER DESCRIPTION
ORDER CODE	87204	87205	
<b>Lipids</b>			
Total cholesterol	✓	✓	Measures the amount of cholesterol in all cholesterol-containing lipoproteins.
Direct LDL-C	✓	✓	Amount of cholesterol in the atherogenic low-density lipoproteins.
Small dense LDL-C (sdLDL-C)	✓	✓	Amount of cholesterol in the densest and most atherogenic LDL-particles. Stronger predictor of CVD than apoB or LDL-P. Includes % sdLDL-C.
Non-HDL-C	✓	✓	Calculation that represents the cholesterol carried by all atherogenic particles.
HDL-C	✓	✓	Amount of cholesterol in high-density lipoproteins (HDL). Higher levels of HDL are associated with reduced CVD risk, but not all HDL is good.
Triglycerides	✓	✓	Elevated levels increase CVD risk by altering lipoprotein metabolism.
Lipid Ratios	✓	✓	TC/HDL-C is a stronger risk factor than LDL-C or HDL-C. Low HDL-C/TG is associated with insulin resistance.
Lp(a)		✓	Elevated levels, present in 20% of the population, are an independent risk factor for CVD.
ApoB		✓	A major protein in atherogenic particles. Stronger predictor of CVD than LDL-C
ApoA-I		✓	A major protein in HDL particles. Low levels are associated with higher CVD risk.
HDL Map		✓	Reflects the quality of HDL metabolism by measuring the HDL sub-particles. Loss of large alpha-1 HDL is a strong predictor of CVD risk.
Cholesterol Balance		✓	Measures cholesterol production and absorption markers. Guides use of treatments to lower cholesterol production and/or absorption.
Fatty Acid Balance		✓	Measures saturated, trans, mono, omega-6, and omega-3 fatty acids. Includes EPA and DHA.
<b>Metabolics</b>			
Glucose	✓	✓	Fasting glucose is a strong predictor of diabetes and CVD risk.
HbA1c	✓	✓	Assesses the average blood glucose over the last two to three months.
Glycated Serum Protein (GSP)		✓	Assesses the average blood glucose over the last two to three weeks. Often reflects prolonged glucose spikes after meals.
Adiponectin		✓	A hormone produced by fat cells that protects against developing heart disease and diabetes. Low values indicate increased risk of diabetes.
Insulin	✓	✓	A hormone produced by pancreatic beta cells and is responsible for transportation and storage of glucose in cells.
Insulin Resistance & Sensitivity (HOMA-IR and S)	✓	✓	Insulin resistance typically exists for many years before pre-diabetes and subsequent type-2 diabetes. Fasting glucose and insulin are used to calculate HOMA-IR and HOMA-S in the homeostasis model assessment.
Beta Cell Activity (HOMA-B)	✓	✓	Fasting glucose and insulin are used to calculate beta cell activity. Beta cells typically over produce insulin to compensate for insulin resistance.
Beta Cell Function and Risk Index	✓	✓	This proprietary test is a calculation that accounts for both beta cell activity and insulin sensitivity. This allows clinicians to assess baseline beta cell function, consider treatment options according to the causes of beta cell dysfunction, and follow changes over time.
<b>Inflammation</b>			
hs-CRP	✓	✓	Acute phase inflammatory protein. Associated with atherosclerosis after excluding other causes.
LpPLA <sub>2</sub>		✓	LpPLA <sub>2</sub> is an enzyme produced by monocytes/macrophages in the setting of arterial plaque and reflects overall plaque burden.
OxPL-apoB		✓	Oxidized lipoproteins accelerate atherosclerosis.
<b>Other Chemistries</b>			
Comprehensive Metabolic Profile	✓	✓	Includes Na, K, CO <sub>2</sub> , Cl, BUN, Creat, Glu, Ca, ALT, AST, AlkPhos, Tbil, Alb, TP and eGFR.
Homocysteine		✓	High levels are associated with B vitamin deficiency and increased risks for CVD and dementia.
Uric Acid			Reflects purine metabolism. High levels are associated with CVD, insulin resistance and gout.
Vitamin D		✓	Vitamin D insufficiency is associated with increased mortality, CVD, type 2 diabetes, and osteoporosis.



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**Boston Heart Diagnostics**, a subsidiary of Eurofins Scientific (EUF.L.P.A), offers a comprehensive and integrated approach to enhance care management. We accomplish this by using the following three phases, each an integral part of our success:

**Characterize:** Diagnostics that drive reports with color coded test results, interpretations and clinical treatment considerations that help characterize risk, develop insight and communicate more reflectively with patients.

**Individualize:** Diagnostic reports communicate test results into actionable, individualized and easy-to-understand steps which improves patient engagement, health literacy and adherence to treatment plans.

**Engage:** Personalized Nutrition and Life Plan will use the patients' lab results and food preferences to provide personalized and easy-to-follow lifestyle direction so patients can improve their test results and reduce their chronic disease risk.

