

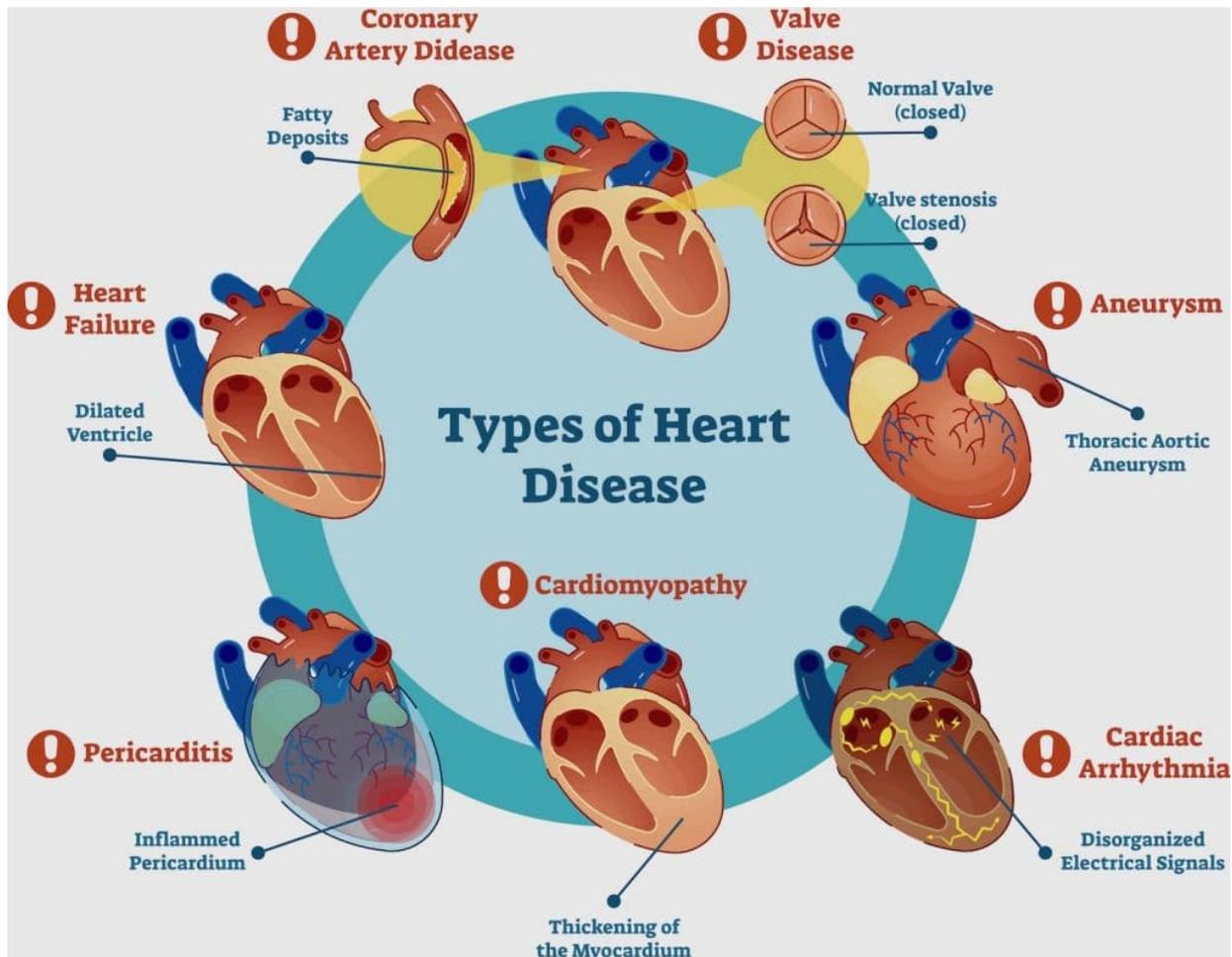
Getting to the Heart of Cardiovascular Disease Through Testing

Cardiovascular disease – a classification of illnesses that involve the heart or blood vessels – can lead to heart attack, stroke, arrhythmia (abnormal heartbeat), cardiomyopathy (enlarged, thickened, or stiffened heart muscle), and coronary artery disease (aka, atherosclerosis and hardening of the arteries). In fact, one person every 40 seconds or so in the U.S. dies from cardiovascular disease.

In our experience, conventional medicine offers only short-term, band aid solutions for heart disease, including the following:

- If your blood pressure is high, your doctor is likely to prescribe one or more medications to lower it, which is a good idea to prevent stroke.
- If your high-density cholesterol level is high, your doctor is likely to prescribe a medication to lower it.

Most medications target one or more causes of cardiovascular disease, but they do not target the *root causes*, which may include hidden infections, nutrient deficiencies, hormone imbalances, mental or emotional stress, or other factors or combinations of factors.



Results from today's next-level tests, such as those we offer at BioDesign Wellness – [Tampa's Functional Medicine practice](#) – in coordination with the Cleveland HeartLab, give us insight into the causes of inflammation in the heart and blood vessels, so that we can pursue a more proactive and longer term approach to correcting and preventing inflammation, which underlies cardiovascular disease and many other chronic health conditions.

Once we understand a patient's complete genetic profile and advanced cardiac markers, we can devise a plan that not only reduces the risk of developing a serious cardiovascular disease but also helps, in many cases, reduce the need for pharmaceutical medications, which can often cause or contribute to other health complications and issues.

The tests we offer in coordination with the Cleveland HeartLab

can be broken down into three categories, each of which is covered in greater detail later in this post:

- Inflammation tests
- Advanced lipid tests
- Advanced cardiovascular tests

Inflammation Tests

If you're a candidate for a study of your body's inflammation, advanced testing is used to evaluate your inflammatory state and cardiovascular risk. The tests we recommend can detect inflammation early or identify advanced stages. Our objective is to catch inflammation as early as possible and start treating it before it becomes a bigger problem.

The inflammation tests we order include the following:

- **ADMA/SDMA:** Elevated ADMA levels are associated with the presence of hypertension, insulin resistance, and *hyperlipidemia* (high concentration of fats in the blood). Fasting prior to testing is recommended, but not required.
- **F2-Isoprostanes:** This is a "lifestyle marker" that measures the amount of oxidation in your body, which may damage your *endothelium* – the tissue which forms a single layer of cells lining your blood vessels, heart, and lymphatic vessels. Eating too much red meat, smoking, or not exercising enough can increase your F2-Isoprostanes levels and your risk for future heart disease.
- **Oxidized LDL (OxLDL):** OxLDL is a marker that measures the amount of LDL (or "bad cholesterol") – cholesterol that has been damaged due to oxidation. Poor lifestyle habits can increase your OxLDL levels and increase your risk for pre-diabetes.
- **Microalbumin:** Microalbumin is a marker of endothelial damage in your kidneys. If the endothelium is damaged in

your kidneys, then it's likely damaged in other parts of your body, including your arteries. Increased levels of urinary microalbumin may identify the presence of diabetes or heart disease.

- **hsCRP:** This is a general marker of inflammation. The presence of a cold may increase hsCRP levels over the short-term (days to weeks). However, the accumulation of cholesterol in the artery walls many result in long-term elevation of hsCRP (years to decades).
- **Lp-PLA2 Activity:** Lp-PLA2, or lipoprotein-associated phospholipase-A2, is a marker that measures the active build-up of cholesterol inside your artery walls. Your risk for a heart attack or stroke increase as Lp- PLA2 levels increase.
- **Myeloperoxidase (MPO):** MPO is a marker that indicates the body's response to a damaged endothelium that has become thinned, cracked, and ultimately unstable due to cholesterol accumulation and inflammation. Your risk for a heart attack increases as your MPO levels increase.

Advanced Lipid Testing

Primary care physicians typically order a standard lipid panel for their patients once a year to evaluate cholesterol and triglyceride levels. The Advanced Lipid Testing we perform here at BioDesign Wellness takes a deeper dive by considering addition risk factors for disease, including the number of atherogenic particles, the size of these particles, and the inherent risk of developing CVD.

The Advanced Lipid tests we run measure the following:

- **Lipoprotein (a) (Lp(a)):** Lp(a) is a plasma lipoprotein consisting of a cholesterol-rich LDL particle attached to an additional apolipoprotein called apo(a). Lp(a) levels are genetically determined and not affected by changes in

lifestyle.

- **Apolipoprotein B (ApoB) and A1 (ApoA1):** ApoB is the primary apolipoprotein found on the surface of LDL (the carrier of “bad” cholesterol), IDL (intermediate-density lipoprotein), VLDL (very low-density lipoprotein) and Lp(a) (lipoprotein (a)). ApoB binds to LDL receptors on various cells throughout the body thereby regulating cholesterol influx into tissues. ApoA1 is the major apolipoprotein of HDL (the carrier of “good” cholesterol) and promotes movement of cholesterol from the artery wall to the liver for excretion.
- **Small-Dense LDL (sdLDL):** LDL, which carries “bad” cholesterol, exists either as large, more buoyant particles or as smaller, more dense particles (sdLDL). sdLDL is more easily oxidized, has a higher affinity for vessel walls, and remains in the circulation longer because it is less likely to be cleared by the liver, making it more atherogenic than larger LDL particles. A standard lipid panel will include the level of LDL but won’t break it down into levels of low- and high-density LDL as this test does.
- **HDL2b:** HDL cholesterol, like LDL cholesterol, can be divided into several categories, based on density, size, and protein composition. The HDL2 (HDL2a and HDL2b) consists of larger, more buoyant particles, whereas HDL3 (HDL3a, HDL3b, HDL3c) are smaller and denser. The largest and most buoyant HDL particle is HDL2b.

Advanced Cardiovascular Tests

We also offer other advanced cardiovascular testing to complement the results from the advanced inflammatory and lipid testing outlined above. Those advanced cardiovascular tests include:

- **Galectin-3:** Galectin-3 plays a regulatory role in inflammation, affecting the synthesis of matrix compounds, such as type I collagen. When cardiac tissue is injured, macrophages infiltrate the tissue and secrete galectin-3 – which promotes collagen synthesis and ultimately leads to cardiac fibrosis and adverse cardiac remodeling.
- **AspirinWorks®:** AspirinWorks® is the only FDA-cleared test that accurately determines aspirin effect (whether the aspirin dosage is effective for decreasing the risk of heart attack or stroke).
- **Troponin T, High Sensitivity:** Cardiac troponin is the preferred biomarker for the diagnosis of acute myocardial infarction (MI) – heart attack. MI occurs when a coronary artery (an artery that supplies blood to the heart muscle) is suddenly blocked, resulting in the death of part of the heart muscle). This biomarker is a good indicator of whether the heart muscle has been damaged.

Regardless of your age or how you feel, monitoring your cardiovascular health for early warning signs of trouble is always a good idea. Generally, the earlier you can intervene and change the course of a poor health issue, the better the outcome.

Don't settle for the standard blood pressure and cholesterol testing, which are limited both in breadth and depth. Insist on a full workup, including the test discussed in this post. For more information or to schedule testing in our Tampa functional medicine clinic, please contact our customer experience manager, Lori, at (813) 445-7770 to schedule a consultation.

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