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How Early Screening By Physicians Is Foundational to Addressing CVD Prevention Initiatives and Restoration Treatments

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Due to screening technology and recent breakthroughs in total system treatments for cardiovascular restoration, such as nutritional intervention, it appears the opportunity now exists for addressing CVD repair, if physicians adopt a 3-step proactive strategy: (a) early sign detection, (b) in-depth follow-up testing, and(c) lifestyle reprogramming.

INTRO

Why is the repair of arterial damage and stiffness rarely a current goal for the physician encountering CVD? Standard medical treatment options are reactive, inclusive of statins, anti-hypertensives, and anti-platelet aggregators. Unfortunately, for the most part, these interventions do not repair the endothelial lining defects responsible for the disease progression. They may appear effective as defensive initiatives but have limited reliability as restorative treatments.

Using digital screening devices able to return waveform data on a range of patient risk factors, we can begin to explore and uncover the state of underlying functions involved in heart health. For the physician, it is step one in the search for causation.

The key to effective restoration treatment is early detection. Screening for diseases prior to patient complaints of symptoms can make them ultimately easier to treat.



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To acquire cardiovascular and nervous system data feedback and related wellness analytics we used the *HeartCheck+ (ANS+CV+)* screening system, along with additional blood tests and ANS examinations, which set the stage for a potentially effective restorative program based on nutritional and integrative treatments.

Having an FDA-cleared and insurance-accepted digital screening capability at the physician's office is a major step forward for front-line practices, where early diagnosis is most likely. Coronary artery disease (CAD) and metabolic syndrome are the #1 killers in the U.S. Their development to serious and sometimes fatal consequences takes decades. Unfortunately, expensive special equipment available at certain hospitals, labs, or clinics, tends to uncover issues only at a later stage, after dysfunction and damage may require invasive and defensive strategies.

ASSESSING CARDIAC FUNCTIONALITY AND ARTERIAL INTEGRITY

Based on an initial screening report electrocardiogram and metabolic stress tests can lend further support to a diagnosis. Family and personal medical history, age, weight, blood pressure, and lifestyle (physical activity, smoking, dieting) factors also contribute to building a CVD profile.

Once the signs of present risk are clear, a suite of blood tests related to cardiac function and arterial integrity may be used to look for predictive traces regarding the chances of

a cardiovascular event, such as a heart attack or stroke. They can signal the degree of risk (remote, moderate, or high), as well.



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A lipid profile by itself is not enough to determine cardiovascular risk. An ultrasound vascular screening, such as an echocardiogram, as well as ankle-brachial index, electrocardiogram, angiography/arteriography, and cardiac cauterization, may add details and visibility.

A single blood test alone is unlikely to determine a patient's risk of a heart attack but a spectral approach to testing may reveal influential factors about whether or not cholesterol has oxidized leading to foam cell formation and impending heart disease. As inflammation is involved in the process of atherosclerosis, in which fatty and calcified deposits clog arteries, patients with known risk of heart disease may be tested for C-reactive protein (CRP). Factoring in hs-CRP test results with other blood tests such as plasma ceramides, B-type natriuretic peptide (BNP), homocysteine, MPO, Lp-PLA2, oxidized LDL, direct LDL, Lp (a), apolipoprotein A and B, fibrinogen, CoQ10, and magnesium, and risk factors for heart disease help create an overall picture of heart health.

INTEGRATING ANS WITH BLOOD TESTS

The sympathetic nervous system increases heart rate and contractility. The parasympathetic nervous system slows heart rates and decreases blood pressure. Sudomotor screening can uncover disturbances to the autonomous regulatory

functions, whether chronic or temporary, as well as the severity and distribution of the dysfunctions. Testing the Autonomic Nervous System (ANS) requires the measurement of Heart Rate Variability (HRV) and Cardiac Autonomic Reflex Tests (CARTs). Diabetes and Parkinson's disease are two examples of chronic conditions that can lead to autonomic dysfunction.



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Additional ANS testing options for severity and distribution of a diagnosed progressive autonomic neuropathy include vasomotor adrenergic innervation and cardiovagal innervation. These, along with HRV abnormalities increase the risk for fatal dysrhythmia.

An ANS analysis is essential to measuring neuro-cardiac functions reflecting on heart-brain interactions and autonomic nervous system dynamics. As the autonomic nervous system is a likely contributor to the function of virtually every organ system, clinical observation of autonomic dysfunction may involve just about any disease. This is why it is critical for early cardiovascular screening to include ANS factors.

Three well-proven technologies with a plethora of literature support are noted with ANS instrumentation. These include pulse width velocity, galvanic stimulation, and impedance. These technologies combined reveal both ANS and CVD risk factors; coupled with the comprehensive blood testing described earlier, it makes a formidable duo inaccurate diagnosis of CVD.

NUTRITIONAL INTERVENTION

When dysfunction is identified, nutritional intervention becomes a viable repair-supportive modality. Treatment and improvement of CVD symptoms and blood

parameters may include diet, oral and parenteral nutraceuticals, exercise, lifestyle modifications, and, when necessary, pharmaceutical intervention.

The impact of nutritional causation for CVD becomes clear when comparing the number of deaths from Myocardial infarction, 3,000 per year in the early 1900s to 500,000 in



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1960, and nearly doubling since then. Although the popularity of diets focuses on weight loss, the nutritional value of a dietary regime is essential to CVD prevention.

Clifton¹ suggests a basic low carbohydrate, moderate protein, moderate good fat, whole food diet, but patient profiles may require a more targeted approach. They need personalized dietary guidelines and recommendations regarding types of fats consumed, sodium content, elimination of artificial flavors, additives, and inflammatory nutrients along with other CVD-provoking foods.

Intervention treatments focus on repair and replacement and rely on nutritional serum concentrations administered via IV and oral nutrient therapy. Magnesium is one of the key ingredients. It is used successfully to prevent/convert atrial fibrillation showing a significant decrease in the number of episodes of atrial fibrillation along with vasodilatory potential.

In IV Therapy, Potassium (K) may be administered to provide solution balance and minimal replacement. Other nutrients might be beneficial:

- Taurine plays a major role in the normal functioning of electrically excitable tissues. It is effective for arrhythmia, cardiomyopathy, congestive heart failure, mitral valve prolapse, and cholesterol reduction.
- Carnitine is concentrated in the heart more than in any other organ. Carnitine has the ability to increase fat oxidation; the heart utilizes fat oxidation extensively for energy production.
- Niacin is currently the most effective drug for lowering LDL-C and raising HDL-C.
- Phosphatidylcholine (PC) use in CVD centers on its possible effect of raising HDL cholesterol. PC infusions can be alternated with chelating agents such as EDTA.
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- And of course, vitamin C, is the only safe substance known to solubilize calcifications of the arteries.

In Oral Restoration Therapy, nitric oxide boosters to vasodilate, essential fatty acids (EFA's), resveratrol, magnesium, vitamin D, CoQ10, and other nutrients are used to lower risk and initiate restoration. In addition:

- Low levels of Vitamin D have been associated with the cardiovascular disease risk factors of hypertension, obesity, diabetes mellitus, and metabolic syndrome, as well as cardiovascular disease events including stroke and congestive heart failure.
- Research has shown that orally administered CoQ10 can improve the functioning of myocardial tissue, strengthening the heart's contractions and making it beat more strongly (positive inotropic effect) and more regularly (anti-arrhythmia effect).
- EFAs fight inflammation decreasing the risk of atherosclerotic plaque development in arteries. Patients should be advised to avoid PUFAs.

Supplementation needs to be managed. The standard regard for efficacy based on valuations derived by the simple addition of benefits from single supplements has given way to an integral model. As Bowen² observes, "Epidemiological research illustrates the

importance of considering the total diet and the interrelatedness of nutrients in a dietary pattern."



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OPTIONS FOR REVERSING CVD

Reversal of CVD depends largely on reprogramming a patient's nutritional lifestyle. Its goal is to reverse the inflammatory process and repair the endothelial lining. Exercise and optimal nutrition with fruits, nuts, and vegetables, plus reduction of poor health habits, have shown to be effective in achieving a 5% regression compared to an 8% progression in plaque size in a single year.³

The level of C-reactive protein (CRP) produced by the liver rises when there is inflammation throughout the body. Elevations of fibrinogen will accompany the rise thereby increasing blood viscosity. Natto bean derivatives and increased water consumption help keep the blood viscosity within normal limits. Lowering CRP is critical to reversing vascular risk and its progression. Tools such as nutrition, nutraceuticals, hormonal balance, lifestyle changes, and primarily intravenous nutrition offer excellent support for reversing its impact on CVD.

Lifestyle changes should be focused on adding good habits and eliminating poor ones. Nutrition studies reveal that a high-quality Mediterranean-style diet provides reduced antioxidant content. It reduces risk of CVD by 20%. Regular consumption of water reduces inflammation and blood viscosity. Avoidance of polyunsaturated vegetable oils will cut out free radicals that can cause damage to arteries and initiate plaque formation.

Exercise is an essential aspect of a reversal initiative as it strengthens the cardiovascular system, cardiac output and lowers resting heart rate. Meditation and heart rate variability training also reduces risk. They are helpful in inducing restful sleep essential to CVD reversal. Parasympathetic training helps the stressed sympathetic driven



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individual (easily identified on ANS evaluation) to create more balance. Coldwater showers, humming, singing, and earthing along with exercise and meditation help achieve this goal.

More recently, the most in-depth Integrative model for the reversal of CVD pathology has been unveiled by the study of the underlying mechanisms that precede disease in light of molecular and cellular biology. Controlled by networks of specialized cardiac cells governing automaticity and cardiac impulse conduction, the structural and molecular components for regulating the properties of the myocardium and systems are critical to the conduction system. While proper cardiac function requires the synchronized electrical activation of the myocardium, improper function is the cause of inflammation associated with cardiac dysfunction.

Molecular tools have an increasingly important role in addressing pathogenic pathways involved in disease onset and progression, including host, viral genetics, and environmental factors. Inherited Cardiac Conduction Disease (ICCD) can be either structural, functional or there can be overlap between these two mechanisms. As patients with inherited structural or functional ICCD suffer from fundamentally different diseases, the implications for diagnosis, treatment, and reversal must be approached differently.

EARLY SCREENING IS KEY TO RESTORATION

It takes a proactive physician, using advanced testing protocols and an integrated treatment approach, to offer patients hope for prevention, restoration, and reversal of cardiovascular disease. In other words, outcome must begin with initiative.



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As an ancient proverb suggests, “Whether one makes a thousand-mile journey successfully depends on the determination embedded in the first step.”

By acquiring cardiovascular and nervous system data feedback and related wellness analytics for 8 critical risk factors using the *HeartCheck+.*, screening system (ANS+ & CV+) the physician is provided with a restorative methodology that works.

The 8 essential risk factors screen for:

1. Cardiovascular Disease
2. Autonomic Nervous System Dysfunction
3. Cardiac Autonomic Neuropathy
4. Cardio-Metabolic Risk
5. Sudomotor Dysfunction
6. Small Fiber Neuropathy
7. Endothelial Dysfunction
8. Insulin Resistance

The algorithms that are used to derive these eight essential risk factors are tried and true, and hold to the medical standards of excellent sensitivity and specificity values. The critical contribution of an integrated screening solution using non-invasive waveform technology can help physicians take charge of progressive diseases such as CVD. Early diagnosis coupled with integrated preventive practices is the best model for a

front-line physician seeking to make a difference in helping people live longer, healthier lives while keeping others from getting sicker.



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References:

Clifton PM, et al. High protein diets decrease total and abdominal fat and improve CVD risk profile in overweight and obese men and women with elevated triacylglycerol. *Nutr Metab Cardiovasc Dis.* 2009 Oct; 19(8):548-54.

Bowen KJ, Sullivan VK, Kris-Etherton PM, Petersen KS. Nutrition and Cardiovascular Disease - an Update. *Curr Atheroscler Rep.* 2018 Jan 30;20(2):8. doi: 10.1007/s11883-018-0704-3.

Piya, Harte, et al. Metabolic endotoxaemia: Is it more than just a gut feeling? *Curr Opin Lipidol.* 2013 Feb 24(1):78-85.