



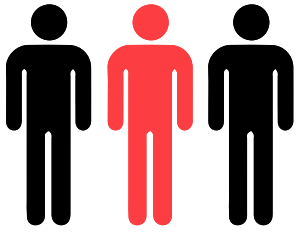
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Getting to the **Heart** of Cardiovascular Disease

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Cardiovascular disease (CVD) primarily involves the heart and blood vessels but its detriment can affect the brain, limbs and other systems in the body. It can increase the risk for heart attack, heart failure, sudden death, and stroke, to name a few. The end result is a significantly decreased quality of life and life expectancy. CVD is often termed the "silent killer" because many times the first sign or symptom is a fatal heart attack. Despite billions of dollars being spent on research and medications, it seems we are fighting a losing battle. CVD is the ultimate interplay between genetics, environment and biochemistry.





1 in 3
American Adults has
some form of
Cardiovascular Disease.

600,000 People Die from
CVD per year
Worldwide.



= In **2010** the
TOTAL COST
of CVD in
the USA

Cardiovascular disease (CVD) is still the number one cause of death in the United States and it affects over 26 million Americans. One out of three American adults has some form of CVD and it kills almost 600,000 people per year. Death rates alone cannot describe the burden of CVD. In 2010, the total costs of CVD in the United States were estimated to be \$444 billion. Treatment of this epidemic accounts for about \$1 of every \$6 spent on health care in this country. Sadly, these numbers are only expected to rise as cardiovascular disease becomes more prevalent. This article hopes to shed light on this devastating disease, how to accurately assess risk factors, and how functional medicine and lifestyle medicine can help you prevent, address and reverse cardiovascular disease.

A Failing Approach

Much effort has been made by many organizations to push for heart health. Still most Americans do not view themselves as being at risk, while others choose not to do anything about it. The sad truth is, despite the efforts of the American Heart Association, heart disease continues to be mainly a lifestyle condition that is preventable and in many cases reversible through the correct interventions. This approach requires an active and participating patient that is given a sense of direction and guidance, not more prescription medications. A pill can never compensate for poor lifestyle choices, nor do medications result in better bio-chemistry.

Interestingly, cardiovascular drugs are some of the most prescribed medications in this country. Medications to treat high blood pressure and high cholesterol do not address the root cause of the problem, they simply make you look better on paper as the disease progresses in

the background. It is critical to ask the right questions if you are going to get to the heart of the matter.

If the current paradigm of heart disease management were correct then logic would dictate that the incidence of cardiovascular disease would be lower or trending in the right direction, clearly that is not the case. We have written this summary to give you a much better understanding of how we at Empowered Optimal Health tackle this massive problem.



Is cholesterol the real enemy?

Debunking the Cholesterol Myth

High cholesterol was once considered anything above 300mg/dl until cholesterol lowering drugs were developed, the value has now dropped down to 200mg/dl. Many patients are placed on cholesterol lowering drugs even if their values are below 200mg/dl. Almost half of all heart disease occurs in those with low or normal cholesterol. In fact a cholesterol lower than 180 mg/dl has been associated with increase risk of stroke.

Is your body making a mistake?

Your body never makes mistakes, it simply responds and adapts to it's environment. You see, cholesterol is the building block of not only stress hormones, but also sex hormones such as testosterone and estrogen. As stress (inflammation, emotions, injury) increases the body requires more cholesterol to fulfill the demand of the environment, a highly intelligent response.

Interesting Cholestrol Facts:

The Framingham Heart Study showed that people with a cholesterol lower than 200 suffer from 40% of heart attacks.

There is clearly more to this problem than simply lowering cholesterol.



Many people who have heart attacks are on cholesterol lowering medications.

Research shows that people that have a cholesterol lower than 180 mg/dl are three times more likely to have a stroke.

Demands that will increase cholesterol requirements include stress, inflammation and elevated demands on insulin (high carbohydrate intake). The cholesterol levels in your body are determined by your environment, **choose wisely.**

The Role of Cholesterol

Cholesterol is necessary for your very survival.

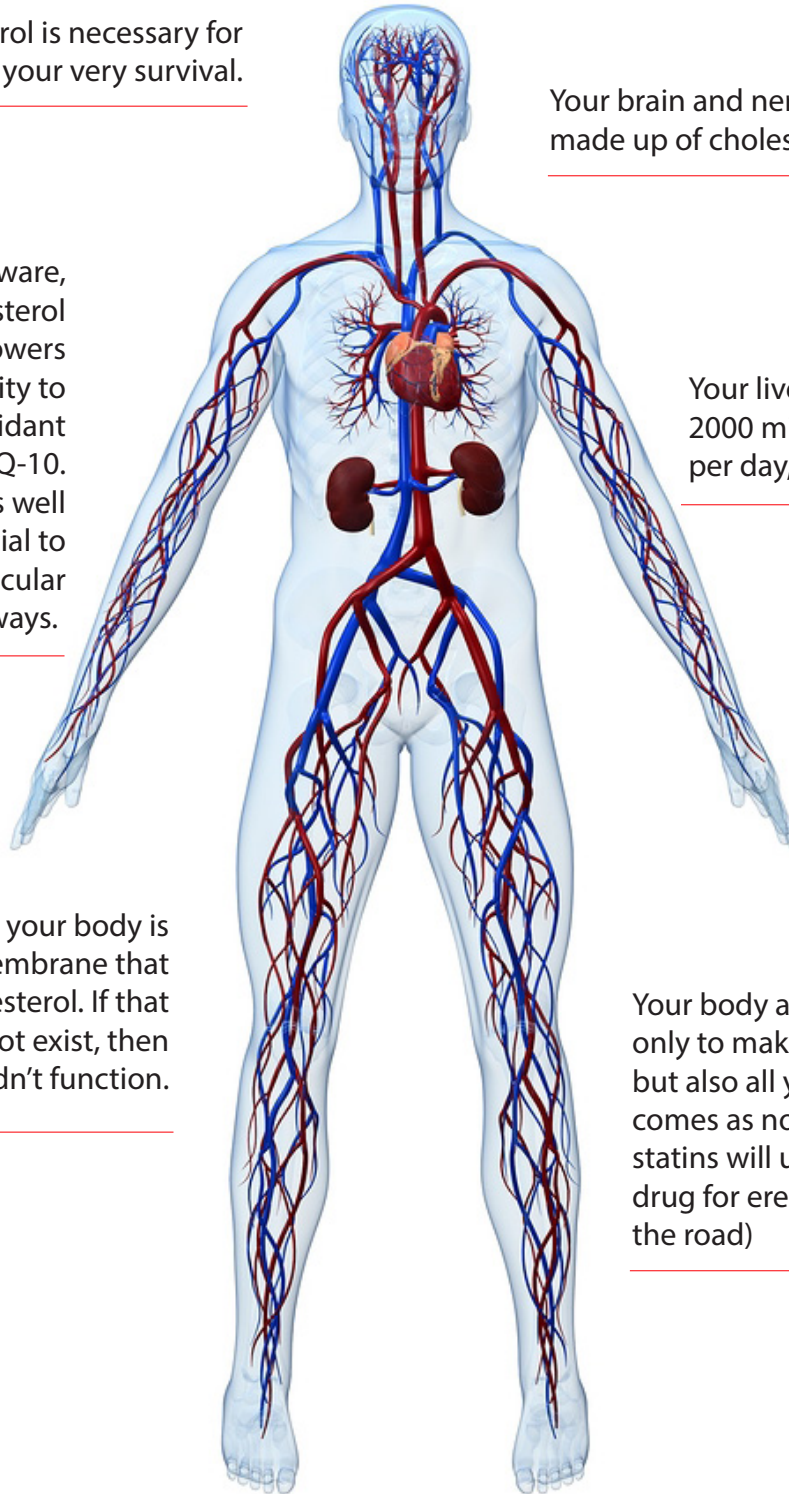
Your brain and nerves are made up of cholesterol.

As most people are aware, taking a statin (cholesterol lowering drug) also lowers your body's ability to make an anti-oxidant called Coenzyme Q-10. Coenzyme Q-10 is well known to be beneficial to numerous cardiovascular and metabolic pathways.

Your liver produces around 2000 milligrams of cholesterol per day, on purpose!

Every cell in your body is surrounded by a membrane that is made up of cholesterol. If that membrane did not exist, then your cells couldn't function.

Your body also uses cholesterol not only to make your stress hormones, but also all your sex hormones. (It comes as no surprise that men on statins will usually have to take a drug for erectile dysfunction down the road)





Size Does Matter

When most patients get tests their doctors measure 4 values; total cholesterol, HDL cholesterol, LDL cholesterol and triglycerides. Not much attention is given to the size of the actual particle - the real risk factor. Particle size of the LDL molecule is of particular importance, not just the number.

For example, three people have an LDL number of 125mg/dl, under traditional assessment each would be perceived as having the same risk value. This is far from true. Each of those people should be put into different risk categories based on the size of the LDL particles. Standard blood tests do not measure the size of the LDL particles. This must be done by a special test that your doctor can order to determine particle size. The smaller the particle size, the higher the risk for CVD. These smaller particles can get stuck between the endothelial cells and cause a build-up that starts the plaque process. Over decades this damage will block the arteries.

One particularly damaging particle known is as lipoprotein (a). This destructive particle has a tendency to promote clotting and inflammation worse than other LDL particles because it oxidizes (rusts), faster than other LDL particles. Currently, the only two reliable agents known to lower lipoprotein (a) is Niacin and L-carnitine, not a medication. Ask your doctor to measure your Lp(a).

Methylation - A critical process to monitor CVD

Methylation is just a fancy word for the transfer of a carbon group from one molecule to another. There are hundreds of forms of methylation that happen inside the body, but there is one methylation process that is of vital importance in CVD risk, homocysteine.

Homocysteine is measured in the blood and is usually high due to a lack of vitamin B6, folic acid, B12 and methyl donors. Think of these methyl donors as workers that move the carbon group from one molecule to another. High levels of homocysteine have several negative effects on blood vessels. These include higher levels of atherosclerosis (plaque formation), impaired function of the cells that make up blood vessels (endothelial cells), hardening of arteries, and an increase risk of clotting.

High levels of homocysteine have been shown to almost double the risk of a cardiovascular event. Simply lowering this number is not enough, addressing why this number is high in the first place is a better long-term strategy.

Cold Heart Fact

CVD is often a disease of personal responsibility and is rooted in lifestyle disorders in most cases. CVD is rooted in Metabolic Syndrome which leads to insulin resistance. Metabolic Syndrome is a preventable condition that is heavily influenced by lifestyle and environment. Metabolic Syndrome consists of elevated fasting blood sugars, high blood pressure, high triglycerides, high LDL ("bad" cholesterol), low HDL ("good" cholesterol), and central obesity, thus leading to insulin resistance.

Insulin resistance is the catalyst of many health issues since it results in high insulin levels, poor cell communication, increases cholesterol, elevates blood pressure and lowered magnesium levels to name a few of its damaging effects.

High levels of insulin have also been proven to increase sodium retention, lower HDL levels and increase the risk of blood-clotting.

Therefore, a more logical step in people with high cholesterol and symptoms of Metabolic Syndrome is to consider strategies to support healthy insulin levels and increase insulin receptor sensitivity. These strategies should include reducing carbohydrate intake, moderate physical activity, weight reduction, blood pressure control, correction of the ratio of "good" and "bad" cholesterol, and blood sugar control have been proven beneficial in reversing the risk of a cardiovascular event. The cold heart fact is, you are in control.



Understanding Blood Markers related to CVD

To give you a better understanding of the markers associated to cardiovascular disease review the chart below. Each lab will use different ranges. Only your doctor can determine the right values for you once they understand your history.

Marker	Significance
Fasting Glucose and Fasting Insulin	Blood sugar handling issues such as diabetes can play a tremendous role in the risk for CVD. High insulin causes an increase in blood pressure, higher cholesterol, and causes more inflammation which can increase clotting risks.
Cholesterol	Although not as sensitive a marker for CVD as drug companies would have people believe, it still does play a role. As you have read, a low number can be just as bad as a high number. Cholesterol can be raised by stress and high levels of insulin, and these contributing factors can be addressed through lifestyle interventions. Remember, your body only makes as much as it needs.
Triglycerides	Usually the first sign of insulin resistance. This can be very beneficial for the younger population to address dietary changes before the effects can snowball into something much worse. Also, this number can change dramatically over a short period if the right intervention is used and therefore, can be a marker to gauge the success of any intervention.
HDL Cholesterol	This "good" cholesterol is the particle that takes cholesterol from the inside of blood vessels to the liver to be broken down. This marker is heavily influenced by physical activity, good-to-bad fat ratios, and diet.
VLDL Cholesterol	This is considered a "bad" cholesterol, mainly because it has the highest amount of triglycerides packed onto it for transport. By lowering triglycerides, this number can be affected as well.
LDL Cholesterol	This is the remains of VLDL. This particle's job is to take leftover cholesterol from the liver and stick it to blood vessels walls that have been damaged by inflammation. Remember size matters with these particles, the bigger the better.
Total Cholesterol/HDL ratio	This marker is a ratio of cholesterol to HDL. The higher the ratio, the higher the risk of a CVD event such as a heart attack or stroke.
Homocysteine	This is a direct measurement of methylation occurring in the body. This marker is much more sensitive than cholesterol in determining the risk of a person with CVD. Homocysteine can be influenced by certain vitamin and nutrient deficiencies, as well as inflammation.
C-Reactive Protein	This is a very sensitive marker for inflammation occurring in the body.
Plasminogen Activator Inhibitor-1 (PAI-1)	This is a marker that can help determine the risk of clotting in a person's blood vessels. Remember, heart attacks and most strokes are due to a build up of clotted material. This marker can be influenced by high levels of insulin.

Blood Markers (cont'd)

Marker	Significance
Fibrinogen Activity	This is another marker used to determine the risk of clotting. The more active a person's fibrinogen, the higher the risk of build up. The most common causes of increased clotting are Cardio-Metabolic Syndrome, estrogen replacement therapy, and smoking.
Lipoprotein Phenotype Profile (LPP)	This test is extremely valuable at determining not only the different types of particles that make up a person's HDL and LDL, but also the size of the particles. These factors can be indexed to determine a person's future risk of CVD as well as ways to modify and lessen these risk factors through certain nutrients and lifestyle interventions.
Omega-3 Index	The Omega-3 Index ultimately determines how your body handles inflammation on a cellular level. The fats a person consumes through their diet ultimately become chemical messengers and parts of cell walls that dictate how that cell handles a stimulus. The response is either pro-inflammatory or anti-inflammatory depending on this index.
Testosterone	Low testosterone is a component of Metabolic Syndrome.
GGT	This liver marker predicts the onset of Metabolic Syndrome and cardiovascular risk.
Folic acid and B12	Both of these markers play a huge role in methylation and therefore must be monitored in those with high homocysteine.
Ferritin	Ferritin is an iron protein complex and is found in most tissues. It is also an acute phase protein and may be increased in inflammation, malignancy, and liver disease.
Thyroid Hormones	Low levels of thyroid hormone can increase risk of CVD
Vitamin D	Low levels of vitamin D are associated with CVD for many reasons.
Vitamin K	A co-factor in clotting.
Heavy Metals	Heavy metals like cadmium, lead and mercury are extremely toxic and inflammatory.
Potassium	Low potassium will increase calcium excretion and raise blood pressure.
Sodium	Sodium imbalance is more to blame for increase fluid retention and increased calcium secretion. Sodium to potassium ratios are very important.
Calcium	Reduced dietary calcium intake is consistent predictor for high blood pressure.
Magnesium	Magnesium regulates blood pressure, calcium, potassium and sodium levels inside the cell, insulin sensitivity and arterial compliance.

Why didn't my doctor tell me this?

We get this question quite often. The role of a traditional allopathic physician is similar to that of a fire fighter. A fire fighter will put out a fire without asking many questions. A fire fighter will not help you rebuild your house. You need the fire fighter to put out the fire but what you also need is someone that is going to help you rebuild your home and make sure it does not burn down again. CVD is a result of a chronic lifestyle disorder. Most medical practitioners are not trained to address lifestyle disorders, they are trained to diagnose and put out fires. Unfortunately there are often no warning signs of CVD, it is up to the patient to take an assertive role in their health and to demand answers.

Many of the tools that are used by most doctors are outdated by as long as 17 years behind the research. The current model of simply measuring a lipid profile and providing a drug to lower total cholesterol without any other type of intervention is an ineffective model to address the complexity of cardiovascular disease. There is no doubt that lifestyle choices, diet, and proper nutrition can virtually reverse all of the major risk factors for cardiovascular disease, as discussed.



A man and a woman are jogging together in a lush, green park. The man is on the left, wearing a dark blue tank top and dark blue athletic pants. The woman is on the right, wearing a light green short-sleeved shirt and dark blue leggings. They are both smiling and looking towards the right. The background is filled with vibrant green foliage and trees, creating a bright and healthy atmosphere.

The Empowered Optimal Health Approach

As you can see, determining the risk factors for CVD can be complex to say the least. Most of the risk factors that we have discussed can only be addressed through lifestyle intervention, specific nutrients, but also predictive testing. There simply are not drugs out there that can modify certain risk factors for CVD. It is our goal to help people address these risk factors by a multi-layered approach and thereby reduce the risk of a heart attack or stroke. This approach looks at the whole patient instead of an isolated set of symptoms.

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