



Cardiovascular Disease Prevention: A New Test for Blood Vessel Function



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Cardiovascular disease (CVD) is the category of health conditions that involve the heart or blood vessels (arteries and veins). Arteries supply oxygen-rich blood to the heart and other organs and tissues of the body. Atherosclerosis refers to waxy plaque build-up in the arteries, one time known as "hardening of the arteries". Plaque accumulation narrows, stiffens and can eventually block the flow of blood through arteries causing heart attack, stroke, and peripheral vascular disease in the legs.

CVD is the number one cause of death and disability in the United States. 1 in 3 people will die from complications attributable to atherosclerosis. This process of atherosclerosis has an early age of onset and evolves over decades. Recent research has shown that early plaque formation is found in over 50% of 7 – 9 year olds. The progression of this condition is usually "silent" for many years with most people in their 40s through 60s still unaware of their potential risk for heart attack or stroke. And then one day, they end up in an ambulance going to the Emergency Room with chest pain. Hospitals are well trained in treating this late manifestation of cardiovascular disease, saving countless lives through emergency medication and surgical opening of the arteries. But not every-

one makes it through these emergencies. And of those that do make it, many will have some reduction in their former healthy function. Additionally, symptoms related to clogging arteries are varied, may be subtle, not recognized as serious and remain untreated. This is especially true for women. How can one know if there is plaque building up and compromising the arteries? CVD is clearly a disease that we want to prevent early – when it is reversible.

Public health messages focus on secondary prevention of CVD – the reduction of risk factors. Risk factors (and % of US adults with this risk factor) for CVD include: Inactivity (53%), Obesity (34%), High Blood Pressure (32%), Cigarette Smoking (21%), High Cholesterol (15%), Diabetes (11%). These risk factors are modifiable. Non-modifiable risk factors include: age, gender and family history. Emerging risk factors include sleep apnea, depression, inflammatory diseases, erectile dysfunction, hypogonadism and other new biomarkers. We know that having 1 of the standard risk factors doubles one's chance of having heart disease and having 2 risk factors quadruples it. 3 or more risk factors increases one's risk more than 10 fold.

Here are some reasons why risk factor reduction is not a perfect strategy. Many people have cardiovascular disease with no risk factors - at least 25% of all heart attacks occur in people with no known risk factors. Many people find it hard to be compliant with a treatment plan when they have no symptoms. Risk factors are still an indirect way of estimating the likelihood of having established athero-

sclerosis. And finally, once you have risk factors, you may already have significant atherosclerosis that is not easily (if at all) reversible.

CVD risk factors are a reflection of blood vessels that are not healthy and not able to function optimally. The endothelium is the inner lining of the blood vessels and it is where the messages occur that allow the vessel to dilate and constrict. Normal endothelial function allows blood to flow smoothly within the blood vessels and protects against the formation of atherosclerosis. When this process is hampered, it is called endothelial dysfunction and *this is the key event in the development of atherosclerosis*. Endothelial dysfunction is found in atherosclerosis, diabetes, high blood pressure, high cholesterol, inflammatory conditions, and in cigarette smokers. It has been referred to as "the risk factor within the risk factors" and predates, by decades, the development of plaque. And unlike established atherosclerotic plaque, early endothelial dysfunction is treatable and reversible.

Endothelial dysfunction can now be measured using an ingenious non-invasive, 15 minute office based test. Biosensors on your fingertips monitor the function of your arteries and sophisticated software analyzes the data. An inflated blood pressure cuff is used to stop the blood flow in 1 arm for 5 minutes. The opposite arm serves as the control. When the cuff is released, the biosensors measure the ability of the artery to dilate appropriately with the surge of blood flow. Endothelial function can be determined based on the ratio of pre and post occlusion measurements. Stiff, poorly reactive

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How Might a Test for Endothelial Dysfunction Help You?

- You want to be screened. You have no known risk factors for CVD but are aware that many people having their first heart attack have had no known risk factors
- Is your dose/compliance with your medications good enough to control the progression of endothelial dysfunction?
- Has your aggressive therapeutic lifestyle change program reversed the endothelial dysfunction?
- You want to be screened. You have some borderline risk factors and prefer not to take pharmaceutical drugs but will if clearly indicated.
- You're having episodes of "atypical" chest pain and have no CVD risk factors. Having normal endothelial function would be reassuring.
- You are interested in primary prevention. You heard that people at low risk of CVD live nearly 10 years longer than people at high risk of CVD.

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arteries will not dilate well and indicate that atherosclerosis is present. A more serious effort to reduce further plaque and other risk would be indicated. This new test is FDA approved, validated in over 100 independent studies and has been used in research centers and pharmaceutical trials in over 40 countries. It has been coming into clinical use to help clinicians and patients more accurately determine an individual's risk for CVD and to monitor the effectiveness of their treatment plan over time. We're excited about having another sophisticated tool in our office that

can help us practice better, more accurate personalized, preventive medicine!

Dr. Kate Thomsen has a holistic health practice in Pennington, NJ. She is board certified in Family Medicine and in Integrative/Holistic Medicine. She has been practicing Functional Medicine for over 14 years. For more information see www.drkatethomsen.com or call the office at 609-818-9700.