

## An Additional Data Point in Assessing Cardiovascular Risk: *Carotid Intima-Media Thickness*

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Pacific Vascular has been engaged in the fight against the adverse effects of atherosclerotic disease for over 20 years and yet the number of individuals affected by the disease is not declining. Atherosclerotic disease affects as many as 64 million adults in the United States<sup>1</sup> and leads to conditions such as stroke, myocardial infarction, abdominal aortic aneurysm and various lower extremity maladies ranging from claudication to amputation. Over 19 million deaths annually are attributable to atherosclerosis.<sup>2</sup> With respect to stroke and heart attack, the patient is often times asymptomatic (e.g., no symptoms and thereby no warning) before a devastating event occurs. The cost to the health care system for resulting hospitalization and interventions and the cost to society in terms of long term care and lost productivity are staggering at over \$403.1 billion.<sup>3</sup> It seems long overdue that we review our strategy regarding the war on atherosclerosis.

The fact that the number of individuals affected by atherosclerosis continues to increase is not entirely unexpected as our healthcare system is largely set up to treat the symptoms of disease, not prevent it. This has prompted some to refer to our healthcare systems as “sickcare”, not “healthcare”. As diet, exercise, and pharmacology can lower the risk of occurrence of adverse cardiovascular events, it would seem far better to identify patients at risk prior to the first event. For example, one meta-analysis concluded that the use of statins could reduce the risk of ischemic heart disease events by about 60% and stroke by 17%.<sup>4</sup> Oral antiplatelet therapy has been shown to be efficacious in limiting events in cerebrovascular, coronary artery, and peripheral arterial disease in a vast number of clinical trials. And, lowering triglyceride levels in high-risk patients “...has been associated with decreased cardiovascular morbidity and mortality.”<sup>5</sup> Clinical trials have shown promise for therapies to decrease the progression of asymptomatic atherosclerosis utilizing gemfibrozil, colestipol-niacin or statin-niacin combination therapy. Other drug combinations are being tested as well to either reduce events or limit the progression of atherosclerotic plaque. Some studies utilizing carotid intima-media thickness (C-IMT) to determine the effect of lipid lowering treatments have actually shown a reduction in the IMT over time.<sup>6</sup> The key then would be to begin counseling and intervention prior to the first occurrence

of symptoms in the population at risk.

Several risk factor assessment models have been developed with all being largely based on traditional risk factors known to contribute to chronic development of atherosclerosis. Traditional risk factor assessment although predicting long term outcome in large populations, falls short in predicting near-future events, particularly in individual clinical practice. “For example, a high Framingham Risk Score, although capable of forecasting an adverse cardiovascular event in 10 years, clearly falls short in accurately predicting events in individual patients, and cannot provide a clear clinical route for cardiologists to identify and treat, to prevent near future victims of acute coronary syndromes and sudden death.”<sup>2</sup>

Ideally, risk factor assessment would include risk factors more indicative of the activity of the disease and thereby potentially allow for a more individualized risk factor assessment to be made. With that in mind, Pacific Vascular is now offering carotid intima-media thickness (C-IMT) screening. The screening involves using ultrasound and special software to measure the thickness of the two innermost layers of the arterial wall of the common carotid artery in the neck. These layers are called the intima (innermost layer) and the media (the middle layer). There is a third layer called the adventitia (outermost layer) which is not involved in the measurement. The intima and media are normally very thin, but in the earliest stages of atherosclerosis become thickened. Based on the thickness of the intima and media, patients are classified as being at a low or increased atherosclerotic related risk.

Increased carotid IMT has been shown to be a structural marker of subclinical atherosclerosis. It correlates with risk factors, relates to the severity of coronary artery disease, and predicts cardiovascular events in vulnerable populations.<sup>7</sup> The Atherosclerosis Risk in Communities (ARIC) Study followed 12, 841 patients for 4 to 7 years and found carotid IMT to be a “noninvasive predictor of future coronary heart disease incidence,”<sup>8</sup> and future ischemic stroke.<sup>9</sup> A recent meta-analysis found “carotid IMT is a strong predictor of future vascular events.”<sup>10</sup> The authors did note the data for younger individuals was limited and required more study. In summary, “The addition of measurements of intima-media thickness to cardiovascular

risk equations may help identify asymptomatic persons who would benefit from aggressive preventive measures.”<sup>11</sup>

C-IMT measurements, as a screening procedure, are not reimbursable under the Medicare program or by most health insurance providers. However, in keeping with both local and national movements to increase the focus of healthcare on prevention and requests by many local physicians to make C-IMT available, Pacific Vascular is pleased to be offering this new service. C-IMT measurements are now included at no additional charge as part of our Cerebrovascular Examination on outpatients referred to our hospital based locations (In the future, availability will include all PVI locations). Additionally, patients can be referred on an outpatient basis specifically for C-IMT screening, in which case, there is a nominal charge of \$45 payable at the time of screening.

Pacific Vascular has been providing C-IMT measurements as part of the Swedish Executive Health Screening (SEHS) program for approximately two years. According to Dr. Edward Noonan, Medical Director, “C-IMT measurements provide an assessment of cardiovascular risk that is more readily understandable to the patient and thereby facilitates the discussion between patient and doctor as to the need for implementation of risk reduction strategies.”

Based on its positive experience working with the Swedish Health Executive Screening program and the requests of its referring physicians, Pacific Vascular is pleased to make C-IMT measurements available by general referral to further the assessment of cardiovascular risk and ultimately, advance all our efforts in the fight against atherosclerosis.

## (Endnotes)

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- <sup>4</sup>Law MR, Wald NJ, Rudnicka AR. Quantifying effect of statins on low density lipoprotein cholesterol, ischaemic heart disease, and stroke: systematic review and meta-analysis. *BMJ*. 2003; 326: 1423–1431.
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- <sup>11</sup>O’Leary DH, Polak JF, Kronmal RA, et al. Carotid-artery intima and media thickness as a risk factor for myocardial infarction and stroke in older adults. Cardiovascular Health Study Collaborative Research Group. *N Engl J Med*. 1999

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