Vitamin D and Cardiovascular Disease
Part One

I want to talk about Vitamin D, a topic that is rarely discussed but has been the subject of new and exciting research regarding its role in cardiovascular disease. I will do this in two parts. The first part will focus on definitions, causes, and function. Part two will discuss treatment. Vitamin D deficiency is now recognized as a pandemic. One billon people worldwide have deficiency or insufficiency. You may ask yourself why is this important and how does it relate to cardiovascular disease? The simple reason is that the evidence of the association between low levels of 25 hydroxyvitamin D [25(OH)D] and higher risk of cardiovascular disease is growing. 25(OH)D levels in the blood is the best functional measure of vitamin D status. In a recent prospective case-controlled study, 18,225 men free of cardiovascular disease were followed for 10 years. It was shown that blood levels of [25(OH)D], vitamin D, less than 30 ng/ml are associated with an increase risk of heart attack. Men who had a level greater than or equal to 30 ng/ml had half the risk of a heart attack independent of other cardiovascular risk factors. Another recently published study from Austria and Germany looked at 3,258 patients who were going to have a coronary angiogram and followed them for 7.7 years. Low vitamin D levels were associated with cardiovascular death. The American Heart Association has published findings online based on NHANES data which indicated a strong graded association between low vitamin D levels and peripheral vascular disease (PAD) with the incidence rising by 35% for each 10 ng/ml decline in vitamin D levels even after statistically adjusting for CVD risk factors.

Vitamin D deficiency is associated with obesity, hypertension, glucose intolerance, and metabolic syndrome (insulin resistance). It has also been associated with other chronic illnesses including colon, prostate, and breast cancer, autoimmune disorders, and polycystic ovarian disease to name a few. We have long known the effects of vitamin D on the musculoskeletal system. Deficiencies affect muscle performance and may contribute to myalgias (muscle pain), proximal muscle weakness, loss of muscle mass, and increased risk of falling. One study showed that 93% of persons 10-65 years of age who came to a hospital emergency room complaining of muscle aches and bone pain were deficient in vitamin D. I bring this up because some patients on statins complain of muscle and joint pain and many physicians blame the medication and stop it. Statins can reduce cardiovascular morbidity and mortality by up to 40%. Many patients, therefore, would not be on necessary drugs (statins) to reduce their cardiometabolic risk because of a presumed side effect of the medication when the person may be vitamin D deficient.

The major source of vitamin D is from the sun, diet, and dietary supplements. 25(OH)D level is the most accurate way to test for a deficiency. It should be noted that the blood concentrations varies by season so levels may need to be done again to accurately reflect one's true level. While the optimal level of 25(OH)D is the subject of debate, most experts consider 32-50 ng/ml (or 50-80 nmol/L) to be normal. A level less than 20 ng/dl indicates deficiency and 21-29 ng/dl is considered insufficiency. Since sunlight is a major

source of vitamin D, sunscreen reduces synthesis of D3 by 93-99% depending on the SPF. Synthesis also decreases with age and obesity decreases the amount available for use in the body. Little or no D3 is produced from November to February for those residing above 35 degrees north latitude. The darker one's skin pigmentation, the more exposure to sunlight necessary to achieve the same levels as a lighter skinned person. There are numerous drugs that lower absorption or increase the destruction of vitamin D in the body. Some stains, however, have been found to increase the levels of vitamin D.