Cardiovascular disease kills more Americans than all cancers combined. These deaths can occur when a life-threatening plaque ruptures in either the coronary or carotid artery. During the last five years we have been developing novel ultrasonic imaging techniques to assess the functional and structural properties of atherosclerotic plaques. In this talk, I will discuss progress we have made in intravascular ultrasound elastography and non-linear harmonic imaging. I will also discuss our work in sparse array vascular elastography, a new technique we have developed for mass screening.