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Carotid Inter-adventitial Distance based Vascular Age and Heart Disease Risk Estimation from B mode Ultrasound

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A method to estimate the risk of heart disease in a person, based on diagnostic ultrasound is proposed here. The "vascular age" obtained from carotid ultrasound is very commonly used as a measure of cardiac health. Existing methods of vascular age estimation make use of the Carotid Intima Media Thickness (CIMT) measurements to arrive at an estimate of the vascular age. Recent work has demonstrated that the carotid inter adventitial distance (CAD) has a direct relation with the risk of coronary heart disease in persons. It has also been demonstrated that CAD correlates better to a number of risk factors accounting for heart disease than the CIMT. Hence, we propose a method to estimate vascular age based on CAD.

B mode images of the carotid artery are analyzed to find out the carotid inter adventitial distance. The vascular age is estimated from carotid diameter using a statistical model developed based on the Atherosclerosis Risk In Communities Limited access database. This vascular age is then used to modify standard risk assessment procedures like the Framingham risk equation to give a better estimate of coronary heart disease risk. A comparison of the method with the CIMT based method is also performed.