Whole Body MRA for Cardiovascular Screening

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Screening test should be sensitive and cheap. For screening purposes whole body imaging may be necessary for quantification of atherosclerotic burden. The sensitivity of MRI may have the intrinsic capability that will provide the advantage that can overcome cost. When comparing MRI to alternatives such as conventional angiography, cost no longer is an issue and it is then comparable to CT angiography.

The choices in performing whole body cardiovascular screening include the choice of coils, choice of pulse sequence and whether to use contrast and if so which contrast.

In general it is often not necessary to scan the whole body for atherosclerotic disease. Head and neck (above the arch), thoraco-abdominal, cardiac and peripheral runoff areas have traditionally been separated. This may in part be due to historical limits on conventional exams, but they still confine areas that may be treated individually. These individual areas each have significantly different needs in imaging coils. Whole body exams can be performed with the body coil transmit receive coils or body coil transmit and surface coil receive or a combination.

When screening for atherosclerotic disease the main issue becomes lumen versus wall imaging. Wall imaging is a strength of MRI but in general requires longer acquisition times. Total plaque burden can be evaluated. The traditional screen has been angiographic and for rapid whole body imaging may require contrast agents. The use of intravascular or diffusible agents couples with the choice of imaging technique. The use of intravascular agents has the advantage of the use of longer imaging times but has the superimposition of veins on top of arteries. This becomes more difficult in the extremities. The use of diffusible contrast requires rapid angiography techniques and bolus tracking or multiple injections.

MRI offers unique opportunities to evaluate large areas for specific screening or whole body imaging to assess cardiovascular disease. Techniques need to be tailored to the disease imaged. Aortic dissections, vasculitis, and atherosclerosis require individualized approaches