

WHOLE BODY CARDIOVASCULAR SCREENING

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Purpose: Cardiac MRI and rapid multi-station imaging with whole body magnetic resonance angiography (MRA) from the skull base down to feet with IV-contrast-enhanced (CE) protocols and phased array coil imaging is possible when employing a retrofit stepping table such as SKIP[®], Stepping Kinematic Imaging Platform (Magnetic Moments, LLC, Bloomfield Hills, MI). There are several natural history and epidemiologic studies that suggest that whole body cardiovascular screening may be the optimum strategy due to a high atherosclerotic risk factor burden in patients with known atherosclerosis.

Materials and Methods: Cardiac MRI is performed with short axis (SA), breath-hold (BH) 3-slice perfusion (with adenosine stress using 0.1 mmol/kg Omniscan), SA, BH-cine (for cardiac function and viability assessment post-contrast) and SA, BH Turbo-FLASH (for myocardial viability post-contrast) sequences. CE-MRA is performed employing Omniscan (0.2 mmol/kg, 40% at 2.5cc/sec and 60% at 1.0cc/sec). A Siemens Sonata MRI system with the following parameters for CE-MRA are employed: TR (1.89-2.02) /TE (0.68-0.76), Flip angle 17°, bandwidth 1090 Hz/px, matrix (192 x 256), interpolated to 512, imaging times 1.8 to 5.1 sec. at each station.

Results: Multi-station high resolution CE-MRA is performed at 5 different anatomical locations with a rapid injection protocol and rapid imaging. Existing coils and hardware are employed to consistently provide high signal-to-noise and

vascular-to- background contrast of the vascular territories from the skull base to feet with only 0.2 mmol/kg MRI contrast. Both cardiac MRI and CE-MRA are comfortably performed during one visit in under one hour. Screening of high risk patients, either with known coronary artery, peripheral vascular, renal or carotid vascular disease, is feasible.

Conclusion: Whole body cardiovascular screening may become economically feasible in the near future avoiding the high costs of multi-modality imaging. It may become justified since morbidity and mortality risks could, in theory, be reduced with surgical and/or interventional treatments, as well as life style and pharmacologic interventions.

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