Whole Body MRA, Oncologic Imaging and Screening

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Preventive imaging involves the evaluation of asymptomatic individuals at risk for the presence of a particular disease. A screening test should detect a targeted disease at a stage which still allows treatment in order to decrease morbidity and/or mortality. The screening test itself must be well tolerated by the examined subjects lacking harmful side effects. For the test to be cost-effective, the target disease should be highly prevalent in the screened population. Restricting screening to a population known to be at increased risk for the target disease enhances the test's effectiveness.

Radiological approaches to screening have included chest radiography for tuberculosis screening throughout Europe in the 1960's and 70's and more recently low-dose computed tomography (CT) for the detection of lung cancer. With the availability of multi-slice CT, elective full-body CT-screening services have become available]. Lack of ionising radiation and contrast agents void of any nephrotoxicity in conjunction with high diagnostic accuracy as well as high spatial and temporal resolution qualify magnetic resonance imaging (MRI) as well suited for preventative imaging. To date cost concerns and lengthy data acquisition times have prohibited its use in this regard. With the highest performance gradient hardware and new whole-body MR imaging concepts, MRI-based screening protocols capable of assessing the brain, the cardiovascular system (whole body MRA), the lung, as well as the colon have become possible. Such an examination protocol can be completed within one hour and can be individually tailored to the respective requirements of the individual undergoing such an examination, e.g. focused on oncologic or cardiovascular imaging.

Further studies are needed to define sub-populations at risk, and have to show whether such MR-based whole body imaging programs can indeed be cost-effective in terms of life-years saved.