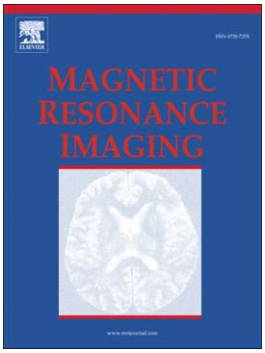

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Finite Element Analysis to Investigate Variability of MR Elastography in the Human Thigh

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Abstract

Purpose: To develop finite element analysis (FEA) of magnetic resonance elastography (MRE) in the human thigh and investigate inter-individual variability of measurement of muscle mechanical properties.
Methods: Segmentation was performed on MRI datasets of the human thigh from 5 individuals and FEA models consisting of 12 muscles and surrounding tissue created. The same material properties were applied to each tissue type and a previously developed transient FEA method of simulating MRE using *Abaqus* was performed at 4 frequencies. Synthetic noise was applied to the simulated data at various levels before inversion was performed using the Elastography Software Pipeline. Maps of material properties were created and visually assessed to determine key features. The coefficient of variation (CoV) was used to assess the variability of measurements in each individual muscle and in the groups of muscles across the subjects. Mean

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