

Modeling Diffusion Processes in Magnetic Resonance Imaging

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Abstract

The paper covers modern approaches to the evaluation of neoplastic processes with diffusion-weighted imaging (DWI). Models of hindered and limited diffusion are studied. We developed phantom with control substances for apparent diffusion coefficient (ADC) measurements ranging from normal tissue to benign and malignant lesions. The phantom can be used to assess the accuracy of the ADC measurements, as well as the effectiveness of fat suppression. The control substances (emulsions) can be used as a body marker for quality assurance in whole-body DWI with a wide range of b-factor values.

Key words: Magnetic Resonance Imaging, Diffusion-weighted Magnetic Resonance Imaging, Water Diffusion, Emulsion, Phantom.

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