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Diffusion tensor imaging and quantitative susceptibility mapping as diagnostic tools for motor neuron disorders



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## ACCEPTED MANUSCRIPT

#### Diffusion Tensor Imaging and Quantitative Susceptibility Mapping as

#### **Diagnostic Tools for Motor Neuron Disorders**

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Declaration of interest: Dr. Sumit Niogi is the inventor of the Reproducible Objective Quantification Scheme (ROQS). Cornell licensed ROQS to Athlemetrics. The remaining authors declare that they have no conflict of interest. \*Authors contributed equally to this work aDepartment of Radiology, NewYork-Presbyterian Hospital - Weill Cornell Medicine, New York, NY bDivision of Biostatistics and Epidemiology, Weill Cornell Medicine, New York, NY cDepartment of Neurology, Hospital for Special Surgery, New York, NY Address correspondence to: Apostolos John Tsiouris 525 E 68th St, Starr 630-C New York, NY 10065 Telephone: (212) 746-2562

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#### ABSTRACT

Purpose: Diffusion tensor imaging (DTI) and quantitative susceptibility mapping

(QSM) have been proposed as methods to aid in the diagnosis of amyotrophic

lateral sclerosis (ALS) and primary lateral sclerosis (PLS), both diseases

affecting upper motor neurons. We test the performance of DTI and QSM alone

and in combination to distinguish patients with diseases affecting upper motor

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