Project Title: Quantitative measures using the CMSC Standardized MRI protocol before and after an MRI scanner upgrade

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Abstract
Magnetic resonance imaging (MRI) scans are used to follow patients with definite multiple sclerosis (MS) to monitor measures correlated with disease progression. Clinical MRIs acquired using the Consortium of Multiple Sclerosis Centers (CMSC) standardized MRI brain protocol are ideal for serial monitoring of MS patients. The use of MRI to follow brain volumetrics relies on the consistency and accuracy of the measures extracted from the brain scans. Upgrading the MRI machine may affect longitudinal MRI measures including, but not limited to, brain volume used by clinicians to assess their patients. This project looks to assess the impact of the MRI upgrade occurring at University of British Columbia (UBC) Hospital on quantitative measures, such as brain volume, in order to calibrate pre- and post-upgrade images. Patients were recruited at the UBC hospital MS clinic. Two MRI brain images were performed, pre- and post- scanner upgrade, on 10 consenting subjects with MS, 6 healthy volunteer controls and on a phantom. Inclusion criteria for MS participants included: age 18 years or older, clinically stable, recent brain MRI at UBC 1.5T as part of routine care, and willing to have a second clinical brain MRI post scanner upgrade. Exclusion criteria included claustrophobia, pacemakers, or metallic fragments in eyes. Quantitative measures include brain volume, T2 lesion volume, and T2 lesion count. Pair wise comparisons will determine degree of agreement between measures and patient characteristics that might influence these differences (for example, large versus small baseline lesion volume). This study will inform clinicians on potential situations that warrant caution when assessing MRI changes over time that can be confounded by technical factors despite consistently using the CMSC MRI protocol (or current version MAGNIMS-CMSC-NAIMS).