

Optimising fMRI Detection of Longitudinal Changes in Age-Related Brain Disorders

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Principal Investigators

Strother, Stephen

Institution

Baycrest Centre for Geriatric Care (Toronto)

Contact information of lead PI

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Research Abstract

Functional magnetic resonance imaging (fMRI) is becoming the brain imaging methodology of choice for studying normal aging and age-related diseases of the brain. But these are complicated studies and in order to optimise use of fMRI there are still many issues we do not understand. Our goal is to identify and study the most important issues that will optimise the use of fMRI for studying treatments and changes over time in age-related brain disease. We will study older normal volunteers and a clinical group diagnosed with Alzheimer's disease. We will test a specific set of tasks that all participants will perform in a fMRI scanner while we monitor their brain function. Usually the same fixed imaging techniques are used for all subjects in an

fMRI study. We have shown we can reliably improve these studies by adjusting our imaging techniques to match each subject. Our initial experiments show that we can improve the ability to detect subtle changes in brain patterns that reflect differences in behaviour using repeated fMRI tests many months apart. Studying repeated tests is important for understanding the limits of fMRI for monitoring treatment after brain injury (e.g., stroke), and detection of changes in behaviour as a function of age that might precede or occur during progression of Alzheimer's disease. We believe that this research will result in improved understanding of brain function, and improved diagnosis, treatment selection, and monitoring of age-related brain diseases.

Further information available at:

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