Progress Report: Quantitative Measures of fMRI Reproducibility for Pre-Surgical Planning
Subaward No: HHSN268201000050C (9a)
PI: E. DeYoe
Reporting Period: months 1-11
Project end date (revised): 8/31/12

Deliverables:

Months 1-3
1. Select, test and install standardized computational sequences including the AMPLE algorithm coordinated with Voyvodic project.
Completed

2. Data compilation/Preprocessing: Data for 8 subjects organized in local imaging data base with table entries to facilitate scripted data queries and analysis.
Completed.

3. Registration of MRI scans with standard atlas brain, generation of brain activation maps, and calculation of image-based quality assurance QA metrics (image motion, signal drift, signal spikes, task activation).
Completed

Months 3-6
1. *Calculate reproducibility metrics for all repeat scans.*
Completed for # of active voxels metric.

Months 6-11 (through Feb 2012)
1. *Calculate reproducibility metrics for all repeat scans.*
Completed for # of active voxels metric.

Partially completed for center-of-mass metric
Reproducibility metrics for fMRI activation cluster centers-of-mass (CM) are now available. Overall reproducibility of this metric across several variations in post-processing was quite good. The standard deviation of the CM location within the brain of single subjects is 3.1, 3.0, 6.53 mm in the left-right, posterior-anterior, and inferior-superior dimensions respectively. These measures can be improved slightly to 2.8, 2.3, 5.9 using Dr. Voyvodic's AMPLE normalization.

In progress for spatial extent metric
We also are making good progress on developing more refined metrics to describe the spatial extent of an fMRI activation cluster based on discussions during some of the recent technical subcommittee conference calls.

With the revised project end date of Aug 31, 2012, we are now back on track to complete all deliverables within that timeframe. The previous impediment associated with obtaining, installing and then modifying the AMPLE normalization has now been removed and we are progressing forward.

QIBA supported presentation:

DeYoe, EA et al (2011) “Reproducibility of Functional MRI – Progress Towards Profile Development”, poster presented at RSNA 2011 Annual meeting

Edgar DeYoe, PhD
deyoe@mcw.edu
414-456-4920