

QIBA fMRI Reproducibility Work Group Call

Tuesday, September 4, 2012 at 11 AM CT

Call Summary

Participants

James Voyvodic, PhD (Chair)

Ted DeYoe, PhD

Jeffrey Petrella, MD

David Soltysik, PhD

RSNA

Julie Lisiecki

Challenges Encountered with Reproducibility Study Data (Dr. DeYoe)

Problems:

- Thresholds were represented as “worse” as reproducibility increased
- Activity patterns from the visual cortex were represented as large, irregularly shaped areas of activation, making measurement difficult
- ROI was used to identify and measure a specific cluster at various threshold settings; a clustering algorithm was run on the data

Solutions (calculation of the reproducibility metric had to be changed):

- Repetition conditions were grouped together to find voxel averages across conditions
- Overlap analysis and ROI was used at a lower threshold setting
- Reproducibility computations were done on everything that fell inside the ROI
- Splitting the area into 2 hemispheres also improved results
- Important to have weighted values, as the activation within the ROI is variable
- The only “problem” now is that the data may be biased toward being more reproducible

Draft Proposal Discussed for Independent Study (Dr. Voyvodic)

- Dr. Voyvodic is working on a process to set up paradigms that are reproducible, related to BOLD signal amplitude, and include calibration conditions
- Would like to experimentally manipulate brain function before and after radiation therapy in combination with neuropsychological testing
- Considerations include the ability to show changes in brain function as well as absence of cognitive decline
- Ultimate goal is to evaluate patients with neurological or psychological issues and determine whether or not treatment is helping

Method:

- Imaging shows difference in function and *where* there are changes in the brain
- Use “difference” as a measure of changes within the brain to pinpoint damage

Next steps

- Dr. Soltysik to present on next fMRI Reproducibility call, *Tuesday, September 18th at 11 am CT*
- Final QIBA/NIBIB project reports due RSNA from Drs. DeYoe, Voyvodic, and Pillai
- Group also needs to discuss what areas to focus on for the following year to plan projects

Next calls:

QIBA fMRI Technical Committee, *Wednesday, September 12, 2012 at 11 am CT*

QIBA fMRI Reproducibility Working Group, *Tuesday, September 18, 2012 at 11 am CT*