

QIBA fMRI Technical Committee Update

Wednesday, April 6, 2011; 11 AM CDT

Call Summary

In attendance

Cathy Elsinger, PhD (Co-chair)

Jeffrey Petrella, MD (Co-chair)

Andrew Buckler, MS

Feroze Mohamed, PhD

James Reuss, PhD

Laura Rigolo, MS

Daniel Sullivan, MD

Domenico Zaca, PhD

RSNA

Joe Koudelik

Agenda

NIBIB Round 2 Submission (Gap Identification and New Submission Discussion)

- Review of Jay's submission
- Review of Jeff's submission

SUMMARY OF THE HIGH PRIORITY GAPS TO DEVELOPING A PROFILE FOR QUANTITATIVE FMRI

- 1) **Neurovascular responsiveness** -- need to know how to measure whether brain regions are capable of producing a BOLD signal
 - a. Determines viability of tissue and to some extent accuracy of measure to begin with
- 2) **Reproducibility** -- need to establish reproducibility of fMRI mapping
 - a. In terms of what measures? (Current readout measures include spatial extent, center of mass, relative amplitude, distance to resection site)
 - b. What analysis methods/algorithms to employ
 - c. What factors affect reproducibility
- 3) **Functional Specificity (Accuracy?)** - need method to evaluate the sensitivity and specificity of relationship between measured fMRI signals and underlying brain function.
 - a. Factors that influence quality (e.g. behavioral response requirements, design of task used to evoke response)
 - b. What is predictive value?
- 4) **Protocol optimization** -- need to be able to evaluate and describe the methodology(s) which will yield most quantifiable result (taking into account at the least all steps listed below in Outline)

Revised Outline of Methodology Details to be described in Profile

- A. Equipment Q/A checks and calibrations
- B. Patient evaluation and fMRI paradigm selection

- C. Patient preparation (instructions, quantitative assessment of behavioral capabilities, adjustment of peripheral equipment)
- D. Pre-scan setup, shimming, selection of slices and other imaging parameters
- E. Paradigm design
- F. Administration of fMRI exams (including performance monitoring)
- G. Post-scan evaluations of alertness, performance
- H. Post processing, artifact detection etc.
- I. Report generation and content, including technical Q/A and evaluation
- J. Visualization and Clinical interpretation
- K. Archiving and export to treatment systems

Next Steps

- Dr Elsinger to follow up with Dr DeYoe concerning status of workflow
- Ms Rigolo to add material
- Drs Pillai and Zaca welcome feedback concerning their NVU proposal
- Drs Petrella and Voyvodic to draft additional Round-2 proposal for Resting State study
- Strategic plan to be incorporated into Round-2 proposals for funding; May 3rd deadline
- Profile v1.0 needs to proceed; studies required to feed the Profile to be identified
- Round-2 proposals to be circulated for feedback
- Next call scheduled for Wednesday, April 20th, at 11 am CDT