QIBA fMRI Technical Committee Update
Wednesday, March 23, 2011 at 11 AM CDT

Call Summary

In attendance

Cathy Elsinger, PhD

Jeffrey Petrella, MD

Andrew Buckler, MS

Edgar DeYoe, PhD

Dirk Loeckx, PhD

Jay Pillai, MD

James Reuss, PhD

Laura Rigolo, MS

Daniel Sullivan, MD

James Voyvodic, PhD

RSNA

Joe Koudelik

Agenda

New Member - Dirk Loeckx (ICOMETRIX) – Welcome and Introduction

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

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 are used

   c. Paradigm design (number of observations, etc)

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 (behavioral response, paradigm design, etc)

   b. What is predictive value?

4) **Protocol optimization** -- need to be able to evaluate which methods (paradigms, image acquisition, analysis) yield most quantifiable result

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. Administration of fMRI exams (including performance monitoring)
F. Post-scan evaluations of alertness, performance
G. Post processing, artifact detection etc.
H. Report generation and content, including technical Q/A and evaluation
I. Visualization and Clinical interpretation
J. Archiving and export to treatment systems

Next steps
- Continue to focus on use-cased for pre-surgical mapping in clinical arena, identify reproducibility characteristics and continue developing the Profile
- Focus on high priority knowledge gaps
- Dr Elsinger to update the identified gap list and circulate to all committee members for feedback
- Dr Pillai to further revise the previous NVU proposal for Round 2 of QIBA funding and circulate to all committee members for feedback
- Dr Pillai to provide brief proposal summary on next call
- Next call scheduled for Wednesday, April 6, 2011 at 11am CDT