

## QIBA fMRI Technical Committee Update

Wednesday, May 8, 2013 at 11 AM CT

Call Summary

### In attendance

Ted DeYoe, PhD (Co-Chair)

Cathy Elsinger, PhD (Co-Chair)

Jeffrey Petrella, MD (Co-Chair)

Tharakeswara K. Bathala, MBBS, MD

Erich Huang, PhD

Andrew Kalnin, MD

Feroze Mohamed, PhD

Jay J. Pillai, MD

James Reuss, PhD

James T. Voyvodic, PhD

Zhiyue Jerry Wang, PhD

### RSNA

Joe Koudelik

Julie Lisiecki

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### Short list of Projects for QIBA Funding Consideration – fMRI Technical Committee

**Project 1:** *Develop fMRI digital reference object* - Standardized fMRI datasets with known “ground truth” are needed for: (1) Verification that testing sites are using methods compliant with procedures specified in profile/protocol, (2) Testing existing and future fMRI data analysis procedures, (3) Public resource for companies, clinics and investigators interested in compliance with QIBA fMRI profile. This project will directly address QIBA objective 4 and will contribute to other projects that may need a DRO as part of their experimental design (See Project 2 – field testing of fMRI Profile below.)

**Project 2:** *Compliance/Field Testing of Profile 1.0* - Determine whether independent sites achieve the Profile claims when implementing the fMRI Profile (field testing using our sites identified in workflow survey): To produce an initial fMRI profile within the shortest possible time, the procedures and results obtained in our previous reproducibility studies need to be vetted across additional clinical sites in order to demonstrate that the procedures are feasible for other sites to implement and to further verify that the stated claims can be met. This will also contribute to the process of obtaining public comment from sites that will actually attempt to reproduce the claims. This project will directly contribute to the production and release of a profile and protocol (QIBA Objective 1) and will generate additional data for the RSNA-QIBA database (QIBA Objective 5).

**Project 3:** *Address bias and linearity issues in Profile using synthetic DRO data* - test sensitivity for measuring position, size, and relative amplitude of known synthetic signal, embedded in varying spatial and temporal noise – further ground work (not limited to topics below).

- A. Continue to explore methods for investigating neurovascular uncoupling (NVU) and calibration techniques for achieving claims.
- B. Refine Profile by measuring impact of methodological differences (Acquisition, Pre-processing, Post-processing procedures) on ability to achieve claims (using DRO and existing data)

**Project 4:** *Assemble and provide data from current QIBA fMRI studies to QIBA image warehouse* (Both DRO and QIBA study data).

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### Discussion

#### QIBA Annual Meeting Goals for discussion and for the breakout session

- Group consideration of future project proposals to include estimated budgets and identifying PI’s (i.e., who will take ownership of these projects)
- Group effort to continue refining the Profile draft, line by line
- Group members are prioritizing projects and developing tentative budgets
- DROs were suggested as a possible option to “feed” other projects, particularly for compliance testing
- More discussion is needed on the best approach to this decision-making process
  - There may be overlapping goals amongst the projects
  - Projects should be centered around the lead investigators
  - Some of the suggested objectives and priorities are amalgams of ideas that were proposed; however, they are quite general at present

- Suggestions for priorities were summarized based on the notes provided to Dr. Elsinger by project investigators

### **Suggested Approaches for Field Testing to Validate Profile Using Current Reproducibility Methods**

- Each site could send activation maps; reproducibility part could be done at a central location
- Dr. Mohamed volunteered to participate as one of the field-testing sites
- A test-ready protocol is needed
- Prior to testing , groundwork needs to be done to establish what constitutes compliance
- A central database for processing of reproducibility metrics needs to be created
- Other considerations include:
  - Including the protocol as part of the Profile to simplify the field testing process
  - Focusing claims around performance parameters useful to manufacturers and software developers

### **Action items:**

- Drs. DeYoe and Voyvodic to document procedural steps used on their funded projects and send to Dr. Elsinger

### **Next calls:**

- QIBA fMRI tech committee call - **Wednesday, May 22<sup>nd</sup>**, at **11am CT**
- QIBA fMRI Bias WG call - **Tuesday, May 28<sup>th</sup>**, at **10am CT**