

QIBA fMRI Technical Committee Update

Wednesday, April 11, 2012 at 11 AM CT

Call Summary

In attendance

Cathy Elsinger, PhD (Co-Chair)
Paul L. Carson, PhD
Barbara Croft, MD
Ted DeYoe, PhD
Andrew J. Kalnin, MD

Feroze Mohamed, PhD
Jay J. Pillai, MD
James L. Reuss, PhD
Laura Rigolo, MS

David Soltysik, PhD
Daniel C. Sullivan, MD
James Voyvodic, PhD
Domenico Zaca, PhD

RSNA

Joe Koudelik
Julie Lisiecki

QIBA fMRI Technical Committee Call Agenda, April 11, 2012

1. Workflow Matrix/Polling

- Review of collated responses
- Distribution at ASFNR
- Posting on the WIKI for further circulation

2. QIBA Annual Meeting

- May 22-23 Hyatt Regency O'Hare
- Breakout sessions on Tuesday 5/22 (3:15-5:15) and on Wednesday 5/23 (10:15 – 3:30 or 5)

3. NIBIB Funded Projects – prioritize/outline upcoming proposal submissions

- **(Ted) Projected funding needs for small scale investigations of SOV's**

Rationale: We anticipate that during the course of developing our current fMRI profile, we will encounter specific issues about some potential sources of fMRI variance that will be addressable with one or more small scale studies. Small scale refers to a single institution, a small number of subjects (1-5), and short duration (< 1 year). The goal of these studies will be to provide some evidence-based estimate of the potential influence (none, moderate, large) of a particular factor on reproducibility or quantitation of fMRI responses when no evidence is currently available from any existing source.

Example topics:

- How important is slice placement (selection and subject head position).
- How important is shimming for reproducibility?
- How important is slice timing correction?
- How important is low frequency drift?

- **(Dr. Voyvodic) Knowledge gaps – priority topics**

Year 1 – assessing and improving reproducibility (currently funded projects)

Year 2 – detecting neurovascular uncoupling (currently funded projects)

Year 3 plus

- How to cope with variability due to subject
 - Task performance
 - Head motion and physiological variables
 - BOLD responsivity (not associated with pathology)
 - Cognitive abilities
- How to optimize workflow to minimize variability due to methodology
 - Identify workflow components that have large impact on variability (e.g. subject training, immobilization, post-processing steps,...)
Each of these will require experimental evaluation.
 - Identify workflow components that have medium impact on variability (e.g. TE, shimming, slice prescription,...)
These will require some optimization to make recommendations.
 - Identify workflow components that have minor impact on variability (e.g. TR, stimulus software, ...)
The profile could just recommend standards based on common practice
- How to relate quantitative BOLD activation maps to brain function
 - Specificity based on prior knowledge of brain function and anatomy
 - Validation studies based on multiple task consensus

- iii. Validation based on intracranial electrophysiological mapping
 - iv. Calculating risk from fMRI maps
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Discussion

ASFNR Poll Follow Up

- Dr. Reuss plans to revise the poll to clarify training and post processing positions; feedback welcome
 - Distribution via Wiki and possibly to ASFNR membership
 - Goal to have agreement on multiple language paradigms for inclusion by 4/25 meeting

QIBA Annual Meeting

- Reservation should be made soon as hotel rooms are very limited
 - There is no registration charge for the meeting
- Topics for discussion in breakout session will include:
 - Year 3 funding for fMRI projects
 - Knowledge gaps and topic priorities
 - Categorization of continuing projects vs. projects aimed at quantitation of a biomarker?
 - Must identify strategically what 2 proposals may be
 - Will need to apply for funding in the short-term
 - Would like specific input from Tech Ctte members
 - Review documents from Drs. Voyvodic and Mohamed regarding knowledge gaps and big picture direction for fMRI Tech Ctte

Sources of Variance (SOV) Discussion

- Items regarding “subject characteristics” were discussed and may be considered as recommendations for referral.
- Items for consideration included:
 - Patient size
 - Claustrophobia
 - Medication issues
 - Physical abilities
 - Cognitive abilities
 - Age – very young to elderly
 - Cooperative nature of patient
- Group proposed that Dr. Mohamed have SOV document available for next call, 4/25, to update as a team and we’ll continue to work through the list item by item.
- Dr. Elsinger will circulate summary of section 1.3 from SOV discussion for comments

Next Steps

- Dr. Mohamed to have SOV document available for next call, 4/25

Next Meetings

- QIBA fMRI Technical Committee, **Wednesday, April 25th at 11 am CT**
- QIBA fMRI Reproducibility WG, **Tuesday, May 1st at 11 am CT**