

QIBA fMRI Technical Committee Update

Wednesday, August 15, 2012 at 11 AM CT

Call Summary

In attendance

Cathy Elsinger, PhD (Co-Chair)

Jay J. Pillai, MD

David Soltysik, PhD

RSNA

Julie Lisiecki

Ted DeYoe, PhD (Co-Chair)

James L. Reuss, PhD

James Voyvodic, PhD

Paul L. Carson, PhD

QIBA fMRI Technical Committee Call Agenda, August 15, 2012

1. Updates regarding funded projects – Drs. Voyvodic and DeYoe; Drs. Pillai and Zaca

2. Workflow Matrix/Polling

- Reached out to Dr. Barboriak and Mr. Ken Cammarata – slight modification in wording.

3. Profile Development

- Received new draft from Dr. Mohamed; Dr. Elsinger to edit and distribute.

- Also would like to review the profile template modifications distributed by Mr. Kevin O'Donnell based on meeting last week of May.

4. Call for Papers – Dr. Reuss distributed – of interest (see following page)

- *Cognitive, Affective and Behavioral Neuroscience* Special Issue titled:

Improving the reliability and validity of neuroimaging findings

- 1-page **proposals are due October 1st, 2012**, and **full manuscripts will be due Dec 1st, 2012**, with the goal of publishing the Special Issue in June of 2013. Please send the 1 page proposal to Deanna Barch at dbarch@wustl.edu

5. Recent Paper shared with the group – Discussion topic for upcoming reproducibility meeting or fMRI TC meeting?

Standardization of Magnetic Resonance Imaging for Clinical Endpoints in Neurology

*Drs. Sunder Rajan and David Soltysik of the Biophysics Laboratory are leading an effort to improve clinical endpoints for safety and effectiveness testing of medical devices. Functional MRI with blood-oxygen-level-dependent (BOLD) contrast is a popular, noninvasive tool that can assess brain activation and can be used as a biomarker. The validation of BOLD as a biomarker has the potential to improve patient selection, treatment selection, and demonstrate treatment efficacy. It is potentially capable of providing objective endpoints for depression, pain, and stroke studies. Furthermore, the developing standards in using BOLD as a biomarker will make its use more reliable and efficient. In an effort coordinated by Dr. Rajan, Dr. Soltysik is studying the sources of variability in BOLD methods to develop phantoms to standardize the imaging. An indication of early success is the publication of a study that measured variability (due to head position) of BOLD contrast images: D.A. Soltysik, D. Thomasson, S.S. Rajan, J. Gonzalez-Castillo, P. DiCamillo and N. Biassou: Head-repositioning does not reduce the reproducibility of fMRI activation in a block-design motor task, *Neuroimage* 2011: vol 56, issue 3, 1329- 1337.*

6. Digital Reference Object – Invite Dr. Dan Barboriak to next call or future call?

Call for Papers: *Cognitive, Affective and Behavioral Neuroscience* Special Issue titled:

Improving the reliability and validity of neuroimaging findings

Editor-in-Chief: Deanna Barch; **Special Guest Editor:** Tal Yarkoni

The explosive growth of the human neuroimaging literature has led to major advances in understanding of human brain function. Alongside these advances, however, there is growing concern that many common practices within the neuroimaging community may not be conducive to the long-term replicability of reported findings. For example, recent commentaries have raised concerns that the effect sizes reported in most studies are upwardly biased; that conventional approaches to multiple comparison correction may be unprincipled or too liberal; that flexible analyses may produce inflated false positive rates; that the inferences researchers draw from their findings go beyond the available data; and that different software packages-or even different versions of the same package-can produce surprisingly different results. In the face of such criticisms, the neuroimaging community has a collective obligation to ensure that the procedures commonly employed in neuroimaging studies maximize the probability of producing reliable, interpretable results that will stand the test of time.

This special issue of *Cognitive, Affective, & Behavioral Neuroscience* will bring together a comprehensive set of articles identifying and addressing threats to the reliability and validity of neuroimaging findings. We seek submissions that target the following questions:

- **What are the major barriers limiting the reliability and validity of reported neuroimaging findings?**
- **What are the consequences of failing to address these issues?**
- **How can researchers, reviewers, and/or editors address these problems in both the short term and the long term?**

Submissions may target issues that arise at any stage of the scientific process, including experimental design, data collection, data analysis, peer review, and post-publication evaluation. Suitable topics include (but are not limited to) multiple comparisons correction, flexible analyses, statistical power, conventions for reporting results, (in)commensurability of software packages, and limitations of the conventional peer review process. Submissions should emphasize constructive solutions to the problems discussed, preferably with a focus on near- or medium-term solutions that could be implemented by the community relatively quickly. Both original empirical articles and review/opinion pieces are encouraged. Manuscripts should be written in an accessible style suitable for CABN's broad readership; technical details should be included as appendices where possible.

1-page proposals are due October 1st, 2012, and full manuscripts will be due Dec 1st, 2012, with the goal of publishing the Special Issue in June of 2013. Please send the 1 page proposal to Deanna Barch at dbarch@wustl.edu.

Discussion

1. Update on funded projects

- As of August 1st, projects were considered complete
- Teams are finalizing reports and will discuss wrap-up of projects on 8/21 fMRI Reproducibility call
- Dr. Pillai has a no-cost extension until September 29th; however, he is planning to submit his 6-month report on 8/15 and Dr. Zaca is working on a final description that Dr. Pillai will use for the 12-month report
- Dr. Pillai discussed some suggestions for follow up:
 - Develop calibration/ normalization algorithm based on CVR abnormality by calibrating normal volunteer data
 - 1 -month milestone: apply language activation map in patients with brain tumors
 - Task-based motor activation maps – using adaptation of Thomason's data: still tweaking data/threshold
 - What was selected as "arbitrary" threshold may not be "ideal" threshold
 - Goal to make fully automated or semi-automated
 - Work on comparing breath hold to perfusion techniques
 - Consider listing current methodological approaches to build on them

2. QIBA fMRI Survey – Next Steps

- Dr. Barboriak and Mr. Cammarata reviewed; slight modification in wording was suggested
 - Dissemination to occur after summer break ends

3. Update on Profile Development

- Group to discuss Profile on next technical committee call, 8/29 and create roadmap for completion
- End of October 2012 targeted for first draft of QIBA fMRI Profile

4. Call for Papers/ DICOM Update

- Dr. Reuss will resume DICOM collaborations once more in the fall

5. Paper shared: Standardization of Magnetic Resonance Imaging for Clinical Endpoints in Neurology (Dr. Soltysik)

- Dr. Soltysik is interested in contributing to the projects
 - His research work on reproducibility of fMRI is related and may be useful to incorporate in the Profile
 - Group to discuss his paper on the 9/4 fMRI Reproducibility call

6. Digital Reference Object (DRO) discussion

- Dr. Barboriak to be invited to an upcoming tech ctte meeting as a guest speaker to address DROs and synthetic datasets
- Database DROs might be a promising focus of the next fMRI project
 - Focus would be on methodology, statistical analysis, and post-processing

7. Other

- There was also a discussion of IRB roadblocks to the use of public image archives related to human subjects
- Dr. Elsinger to raise issue at next QIBA Steering Committee Meeting

Next Steps:

- Dr. Elsinger to follow up with Mr. Cammarata at ASNR regarding survey dissemination to ASNR and ASFNR

Next Meetings

- QIBA fMRI Reproducibility WG, **Tuesday, August 21st at 11 am CT**
- QIBA fMRI Technical Committee, **Wednesday, August 29th at 11 am CT**