QIBA fMRI Technical Committee Update

Wednesday, January 18, 2012 at 11 AM CST

Call Summary

In attendance			RSNA
Cathy Elsinger, PhD (Co-Chair)	Ted DeYoe, PhD	Laura Rigolo, MS	Joe Koudelik
Jeffrey Petrella, MD (Co-Chair)	Feroze Mohamed, PhD	David Soltysik, PhD	Julie Lisiecki
Paul Carson, PhD	Jay J. Pillai, MD	James Voyvodic, PhD	
Barbara Croft, MD	James L. Reuss, PhD	Domenico Zaca, PhD	

QIBA fMRI Technical Committee Call Agenda

General Items:

Profile draft has been uploaded to wiki – please provide edits/suggestions to this document

ASFNR Meeting

- Drs. Reuss and Voyvodic submitted abstracts for poster – will use 2011 RSNA QIBA Kiosk poster for meeting
- Face to face meeting – suggested meeting times below:
  - **6:00-6:30 AM on Wednesday or Thursday (March 7th or 8th)**
  - **Friday morning, (March 9th), between 7:00 - 8:20am (We suggest Friday as a good time to meet). Continental breakfast will be served each morning.**

  If in the evening, the options are:
  - **Tuesday evening could work if the committee members will be in town then.**
  - **The pre-meeting hands-on workshop ends at 5:00pm**
  - **Wednesday evening after the Welcome Reception which ends at 7:15pm**
  - **Thursday evening after the BOLD fMRI study group meeting which ends at 6:30pm**

Note that there will be a cost for the room. Options to consider include:

- Checking to see if this can be covered by RSNA/QIBA
- Meeting in a less formal way if the group is small (i.e., dinner meeting after the BOLD fMRI study group).

Profile Development and Claims Construction:

1. Should our profile be a description of the CURRENT state of the art or a description of what the state of the art ought to be in the FUTURE to make fMRI an optimal quantitative biomarker?
2. Do we necessarily start with characterizing current state of the art with a focus on IMPROVING practice methodology at ALL stages from data acquisition -> analysis -> readouts of interest.
3. Important to address all aspects of the methodology for creating the map/measures of interest (Profile) –not just the analysis. Reproducibility is likely affected by **many** factors.
4. Suggestions for Claims (Dr. Voyvodic)

   A. fMRI can reproducibly localize the center of mass of motor cortex functional brain regions to within 5 mm.

   B. fMRI can reproducibly determine the spatial edge of motor cortex functional brain regions to within 5 mm.

   C. fMRI can reproducibly localize the center of mass of language cortex functional brain regions to within 10 mm.

   D. fMRI can reproducibly a laterality index for hemispheric dominance of cortical language functional regions to within 20%.

   E. fMRI can reproducibly determine the spatial edge of language cortex functional brain regions to within 10 mm.

Current Claims characterizing reproducibility of BOLD response

1. *On a test-retest basis, fMRI can be performed reproducibly to a level such that the center of mass of activation of a focus of interest is within 5mm of itself, with at least 90% overlap of the activation clusters.*

2. *On a test-retest basis, fMRI can be performed reproducibly to a level such that the relative magnitude of activation in homologous regions across hemispheres should be within 10%.* Claims characterizing risk assessment (predictive value?) -TBD

Comments from Dr. Carson regarding claims construction:

1. Recommendation is not to do a review article nor summary of all current techniques, but why claims and approaches are chosen.

2. Strong weighting should be given to consolidating and validating the current state of the art. Do improvements where really needed and accomplishable in a year or two.

Discussion

- Dr. Elsinger circulated an Executive Summary that addresses some of the Profile content issues
    - Purpose of putting this QIBA committee together (researchers, clinicians, industry) is to provide an authoritative statement for current state-of-the-art and also to help others understand what it is possible to achieve
- Dr. Voyvodic suggested that the main focus of the group should be identifying ways to show how fMRI can be used as a quantitative biomarker
- Currently, fMRI is considered a quantitative biomarker for the spatial distribution of activation
    - Would like it to be more accurate for other measurements
- To be a biomarker, the metric has to produce the same result across institutions/sites
- Claims also must indicate limits when working on reproducibility aspects
    - Specifying the limitations of accuracy of distribution that can be achieved
- Aspects of Claim language requiring more discussion:
    - Starting point
    - Sources of potential variability
    - Whole biomarker or spatial distribution
    - Technique used by expert qualifier and how this is achieved
    - Software, training, expert procedures, etc.

Next Steps

- Group to discuss Profile Claims wording on next call
- Profile draft has been uploaded to wiki – Group encouraged to provide feedback
- ASFNR f2f meeting plans to be finalized

Next Calls

- QIBA fMRI Technical Committee, ***Wednesday, February 15th, at 11 am CST***
    - *the QIBA Steering Committee is meeting on February 1st in Chicago*
- QIBA fMRI Reproducibility WG, ***Thursday, February 2, 2012 at 11 am CST*** ***(subject to change for future calls.)***