

## QIBA fMRI Biomarker Committee (BC) Call

Wednesday, June 2, 2021 at 11 a.m. (CT)

### Call Summary

#### In attendance

Feroze Mohamed, PhD (Co-chair)

Jay Pillai, MD (Co-chair)

David Soltysik, PhD (Co-chair)

Shruti Agarwal, PhD

Cathy Elsinger, PhD

Ping Hou, PhD

Ichiro Ikuta, MD, MMSc

Ho-Ling (Anthony) Liu, PhD

Nancy Obuchowski, PhD

James Voyvodic, PhD

Divya Yadav, MD

Francisco Zamorano, PhD

Yuxiang Zhou, PhD, DABR

#### RSNA staff

Joe Koudelik

Susan Stanfa

#### Review of Previous Call Summary

- The 05.05.2021 call summary was approved as presented

#### Update on Language-Mapping Reproducibility Studies

- Dr. Voyvodic to submit two papers for publication based on the language-mapping reproducibility study; this work is informing the fMRI Language-Mapping Profile v2.0 and will support its Claims
  - Both papers to be submitted to *Radiology* (for right of first refusal)
  - AJNR suggested as a back-up journal if needed due to its neuroradiology focus
  - *NeuroImage: Clinical* journal also suggested due to no word limit constraints
- One of the papers will be focused on QC, the data quality constraints and laterality Claims for achieving the target level of reproducibility and will be ready to submit for publication by the end of June
  - After calculating the correlation coefficient for every single parameter, the strength of the activation signal was determined to be the best predictor of data quality, followed by:
    - A consistency index of task performance and its impact on variability and motion
    - Motion parameter (e.g., FD, RMS)
  - A half max of four (based on a peak value AMPLE threshold of 8) was deemed the best predictor of image quality, but is a stringent threshold that may eliminate many smaller clusters of activation in secondary language areas
  - Other ways to calculate laterality and other thresholding methods besides 50% AMPLE thresholding and AMPLE-weighted values to be included
- The second paper will focus on location and size of language activations, focusing on clustering results
  - Broca's area (BA) and Wernicke's area (WA) to be the focus for localization; the ROIs for laterality will include frontal and temporal lobes, symmetrical in the left and right hemispheres
  - Maps were scored based on the amounts of activation overlap, with greater overlap signifying a better scan
- A potential third paper would focus on Dr. Voyvodic's DRO project results, i.e., discrepancies/variability observed among imaging sites regarding how they align anatomical images
- Recommendation to submit papers based on QIBA Profiles and activities to *Radiology*, similar to the FDG-PET white paper, as this is an RSNA journal with a high impact factor, reaching a clinical audience and helps to bring visibility to QIBA
  - *Radiology* submissions are limited to 3,000 words and 6 figures

#### Review of May 27 (Q2) MR Coordinating Committee Meeting

- One major goal of the 2021 QIBA Campaign is the advancement of Profiles at least one stage by the end of 2021 and submitting at least one manuscript for peer-reviewed publication

- Discussion regarding advancement of fMRI Profiles from Consensus (Stage 2) to Technical Confirmation (TC) (Stage 3)
- Efforts toward the fMRI Motor-Mapping Profile v1.0 were shifted away from it prior to reaching Stage 2
- After the fMRI Language-Mapping Profile v2.0 has been written, distributed for public comment, and the consensus process is completed, the aim will be to enlist 3+ sites for Profile feasibility testing
  - This two-step process includes (1) sites implementing the Profile, and (2) sites collecting/submitting data based on results of implementation
- Resulting site feedback and data will be used to refine Claims and advance the Profile to stage 3; requirements can be found on the [TC Process page](#) on the QIBA Wiki
- Site-testing may be conducted through a multi-center DRO project on the reproducibility of language activation and a group publication would follow; if funding for this publication is not available via QIBA/RSNA, suggestion made to divide the cost among co-authors
- Some QIBA groups have partnered with clinical trials and are advancing toward TC in that way, fMRI BC members are not privy to any pending or active trials related to language-mapping at this time
- There was concern that excessively stringent Profile requirements would be a barrier to site implementation and that general methodology guidelines should be provided; data will still show that by following protocols, the Claims can be achieved, and reproducible data will be acquired
- Before sites are recruited for testing, it was suggested that a checklist with conformance requirements be developed for review and feedback; after determining which requirements are absolutely necessary for achieving Claims, the checklist can be refined
  - Additional non-required checklist items could be included in the appendices
  - Suggestion to solicit feedback from both novices and experts imaging sites
- The [fMRI Committee page](#) on the QIBA Wiki can be utilized to post publications, presentations and talks; staff to be contacted at: [qiba@rsna.org](mailto:qiba@rsna.org) for assistance
- Process Cmte leaders have been revising the Profile template based on a reorganization of section content for streamlining and ease-of-use

#### Next Steps:

- fMRI Language-Mapping Profile 2.0 Claim development to be discussed during June 16 meeting

**Next call:** Wednesday, June 16, 2021 at 11 a.m. CT (1<sup>st</sup> & 3<sup>rd</sup> weeks of each month)

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