QIBA fMRI Biomarker Committee (BC) Call
Wednesday, November 6, 2019 at 11 a.m. CT
Call Summary

In attendance   **RSNA staff**

Feroze Mohamed, PhD (Co-chair)   Andrew Kalnin, MD   Nancy Obuchowski, PhD   Joe Koudelik
David Soltysik, PhD (Co-chair)   Ho-Ling (Anthony) Liu, PhD   James Voyvodic, PhD   Susan Stanfa
Ping Hou, PhD

Review of Previous Call Summary
- The 10.16.2019 call summary was approved as presented

QIBA Posters at RSNA 2019
- Dr. Pillai followed up with Drs. Boss and Rosen on Oct. 30 to gather more poster/template details

Literature Review
- A literature search and review of presurgical language-mapping with fMRI repeatability studies are underway; several were highlighted
- Discussion continued re: Partovi S, et al. **Effects of covert and overt paradigms in clinical language fMRI**. *Acad Radiol*. 2012.
    - Language localization and BOLD signal characteristics were largely consistent using covert and overt paradigms
    - This study revealed high intra-individual and inter-individual reproducibility of language localization and lateralization using covert sentence generation (SG) and word generation (WG) paradigms; the data support using covert language tasks
    - Figures were reviewed and discussed, including:
        - Scan of increased motion artifact in overt vs. covert paradigms
        - Comparison of language lateralization in overt vs. covert paradigms for Broca's area versus its right-hemisphere homologue; and Wernicke's area versus its right-hemisphere homologue

    - Discussion re: how laterality was measured in this study and where activation occurred in the images
    - Dr. Voyvodic discussed his methodology, which includes covert tasks 98% of the time; overt tasks are used only when the patient is confused by the instructions for covert tasks
    - It was suggested that overt vs. covert tasks would not affect laterality, especially in Broca's area
    - May consider establishing fMRI Profile Claims on covert tasks based on the existing literature and expand later to overt tasks if new findings are published
    - The task at hand will be to justify Claims made in the fMRI Profile, but not to declare that they are "all inclusive" or the "best"; the claim can only be supported by the limited data available

- Discussion continued re: acquiring reliable reproducibility results using Dr. Voyvodic's methodology in: Voyvodic J. **Reproducibility of single-subject fMRI language mapping with AMPLE normalization**. *J Magn Reson Imaging*. 2012.
    - Dr. Voyvodic stated that there are not enough data to determine confidence intervals for the Profile Claims
    - Discussion occurred re: Dr. Voyvodic and his language reproducibility study currently underway
        - A Neuroradiology student at Duke is in the process of making sure all scans are anatomically registered, which is the 1st step in comparing activation among different scans
        - Then, activation maps will be produced, and "real" numbers will be generated

- o   Anatomical regions of interest used to measure activation and laterality need to be refined
- o   Dr. Voyvodic has submitted his head motion DRO paper and is awaiting an update from the publication (Journal NeuroImage)

- Morrison, et al. Reliability of Task-based fMRI for Preoperative Planning: A Test-Retest Study in Brain Tumor Patients and Healthy Controls. *PLoS One*. 2016, was discussed
  - o   This was a within-session repeatability study
  - o   The center of mass was found to be more repeatable than peak activation, which is an argument for using weighted center of mass rather than peak activation

- Dr. Voyvodic requested that those who have feedback regarding laterality index and how it should be measured, contact him; this will be the discussion topic on the next BC call
- Consensus is desired re: how laterality index fares in task-based fMRI vs. resting-state fMRI in language-mapping; it was noted that task-based is currently preferred

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- Please RSVP for the Dec. 4 QIBA Working Meeting during the 2019 RSNA Annual Meeting
- Please sign up for the RSNA 2019 MTE Sessions at the QIBA Kiosk:
  - o   Type in your name next to the presentation time slot that works for you (we encourage that each 30-minute time slot is filled by at least one committee member)
  - o   Simply close out of the document (there is no save button and changes will automatically save)

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Next call: Wednesday, November 20th, 2019 at 11 a.m. CT (1st & 3rd weeks of each month)