

## QIBA fMRI Biomarker Committee (BC) Call

Wednesday, January 6, 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)

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 12.16.2020 call summary was approved as presented

#### Discussion on Language Mapping Profile v2.0 Claims

- Two Claims will be developed: laterality and location of activation
  - Laterality index (-1.0 - >1.0) – within 0.6 of true LI
  - Laterality – Dominance; match true dominance
  - It was noted that while LI is a good metric for the Profile claim, dominance may be redundant
- It was noted that center of mass (COM) is not as good in terms of reproducibility
  - It is calculated and related to active regions, but may be altered in a map when thresholds are adjusted; using a weighted COM could help to mitigate this issue and will be looked into further
- Value for cluster peak location was set within 20 mm of true peak location; discussion continued from the Dec. 16 meeting re: repeatability data and whether 10 mm is a realistic goal
- A standard in QIBA is to set Claims at 95% confidence, however, could consider different confidence rates for different measurements
  - With comparison maps that agree, confidence interval can be higher
  - Dr. Pillai to provide an overview of his findings during the Feb. 3 fMRI BC call
    - Within some regions, e.g., Wernicke's area, he was able to reach 95% confidence on sentence completion task
    - It was noted that there was a positive correlation between ROI size and amount of variation
    - Since fMRI BC member call participation may have changed slightly since these data were last presented, a review would be worthwhile
  - Dr. Liu noted that his data was consistent with Dr. Voyvodic's
- It was recommended that only scans of active, clinical tasks performed successfully by the patient should be included in the dataset
  - It was explained that with outlier data showing major shifts in LI from a first scan session to second, difference could be due the patient's difficulty understanding/executing the task during the first run, with a significantly better performance during the second run, i.e., patient mental status could affect results
  - Selection bias in types of patients referred could also cause discrepancies in data
  - If there is good reproducibility with lower activation values, the Claims would need to be adjusted
- Dr. Voyvodic found that significant signal strength of activation in language areas, e.g., frontal, temporal, parietal, were the only reliable criteria for distinguishing good maps from bad, however, other criteria may also be considered

- AMPLE threshold of half max of four was deemed to be a stringent threshold that may eliminate many smaller clusters of activation in secondary language areas; some fMRI BC members take these smaller clusters into consideration
- Registration issues in Claims still to be addressed; to be determined to what extent the issue is due to a shift in activation map itself or to laterality
- fMRI BC members were encouraged to take note of any additional questions and bring them to the next call

**Next call:** Wednesday, January 20, 2021 at 11 a.m. CT (1<sup>st</sup> & 3<sup>rd</sup> weeks of each month)

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