

## QIBA fMRI Biomarker Committee (BC) Call

Wednesday, November 20, 2019 at 11 a.m. CT

### Call Summary

#### In attendance

Feroze Mohamed, PhD (Co-chair)

Jay J. Pillai, MD (Co-chair)

David Soltysik, PhD (Co-chair)

Cathy Elsinger, PhD

Ping Hou, PhD

Andrew Kalnin, MD

Ho-Ling (Anthony) Liu, PhD

#### RSNA staff

Joe Koudelik

Susan Stanfa

#### Review of Previous Call Summary

- The 11.06.2019 call summary was approved as presented

#### Literature Review

- A literature search and review of presurgical language-mapping with fMRI repeatability studies are underway
- Discussion on the following publication and issues concerning Laterality Index (LI) (e.g., how it should be measured, how it fares in task-based fMRI vs. resting-state fMRI in language-mapping): Seghier ML. [Laterality index in functional MRI: methodological issues](#). *Magn Reson Imaging*. 2008; 26(5): 594-601.
- It was noted during the Nov. 6 fMRI BC t-con that task-based is currently preferred; LI may be prone to errors and is generally not as reliable
- Discussion re: using resting state to calculate laterality; neurosurgeons currently prefer a qualitative assessment, so requests to quantify laterality are generally not received today
- Discussion re: focus for fMRI Profile v2.0: language-mapping for tumor presurgical planning only, or tumor and epilepsy presurgical planning
  - Agreement to focus on tumor and epilepsy presurgical planning
  - Suggestion to recruit an expert who does these studies routinely (epilepsy radiologist); Drs. Elsinger and Mohamed to reach out to neuropsychologists
  - Two separate Claims would be needed since these follow different approaches
  - Dr. Pillai mentioned a 2017 white paper that established fMRI as a standard for language mapping, making laterality assessment more useful clinically
- Eight different LI issues were outlined and discussed
  - 1. Counting voxels v. counting voxels weighted by the statistical strength
  - 2. Global versus regional ROIs: fMRI BC members may be more interested in regional ROIs, e.g., Broca's and Wernicke's areas
    - Discussion to continue during upcoming calls; a paper on six critical language regions paper to be reviewed and is more in line with those who do presurgical mapping
  - 3. Setting an LI threshold to determine dominance (0.2 is reasonable for language)
  - 4. LI can vary across thresholds
  - 5. The chosen threshold can be defined by statistical strength or the spatial extent of activation: it was noted that the volume of activation cluster not as important as which gyrus to which a cluster corresponds
  - 6. LI will vary across tasks: there are different results for different language tasks
  - 7. LI can vary for different baseline tasks: an appropriate baseline task needs to be chosen
  - 8. LI reproducibility can vary, e.g., it is higher for verb generation tasks, inferior frontal ROIs, and when computed using F statistics

## Next Steps

- fMRI BC members were encouraged to bring additional studies of presurgical language-mapping with fMRI repeatability for discussion during upcoming calls
- Due to low expected attendance, the fMRI breakout session planned for the Dec. 4 QIBA Working Meeting has been cancelled
- The December 4<sup>th</sup> call falls during RSNA Annual Meeting, so the group will reconvene on December 18<sup>th</sup>

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**Next call:** Wednesday, December 18<sup>th</sup>, 2019 at 11 a.m. CT (1<sup>st</sup> & 3<sup>rd</sup> weeks of each month)

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