

## QIBA fMRI Reproducibility Work Group Call

Tuesday, June 12, 2012 at 11 AM CT

Draft Call Summary

### Participants

James Voyvodic, PhD (Chair)

Paul Carson, PhD

Ted DeYoe, PhD

Cathy Elsinger, PhD

Jay J. Pillai, MD

Daniel C. Sullivan, MD

Domenico Zaca, PhD

### RSNA

Joe Koudelik

Julie Lisiecki

### PowerPoint Presentation

- Drs. Pillai and Zaca presented results regarding funded QIBA NIBIB project on neurovascular uncoupling.
- Project Title: "Validation of Breath Hold Task for Assessment of Cerebrovascular Responsiveness and Calibration of Language Activation Maps to Optimize Reproducibility"
- "Conceptual shifts in our understanding of cerebral blood flow control have important implications for the development of new therapeutic approaches." –
  - Attwell D, Buchan AM, Charpak S. [Glial and neuronal control of brain blood flow](#). *Nature* 468,232–243(11 November 2010), doi:10.1038/nature09613

### Project Aims (from Dr. Pillai's presentation):

1. To validate BOLD Cerebrovascular Reactivity (CVR) mapping as a tool for assessment of neurovascular uncoupling (NVU), which impairs detection of BOLD signal within viable eloquent cortex, by comparison of areas pathologically reduced CVR to areas of regional perfusion abnormality

COMPLETED: Pillai JJ and Zaca D. *Technol Cancer Res Treat* (2012 in press)

2. To implement and evaluate a BOLD CVR calibration algorithm to minimize inter-subject variability and optimize activation in language fMRI activation maps

COMPLETED

3. To evaluate how BOLD CVR calibrated maps can be used to generate reliable fMRI activation maps in the setting of NVU associated with brain tumors

IN PROGRESS

### Topics discussed:

- Breath hold paradigm and cycles
- Comparison of BOLD cerebrovascular reactivity mapping and DSC MR Perfusion Imaging for prediction of neurovascular uncoupling potential in brain tumors.
- Validation of BOLD cerebrovascular reactivity (CVR) and BOLD DVR calibration algorithms
- How "clean" the map is depends on how well the patient is able to perform the task; Inter-subject variability still exists
- Cannot invoke angiogenesis as an explanation for neurovascular uncoupling
- Definition of negative pixel activation
- Discussion to continue on next call

### Next steps

- Drs. Pillai and Zaca to continue PowerPoint presentation on next QIBA fMRI Reproducibility call

### Next calls:

QIBA fMRI Technical Committee, [Wednesday, June 20, 2012 at 11 am CT](#)

QIBA fMRI Reproducibility Working Group, [Tuesday, June 26, 2012 at 11 am CT \(?\)](#)