QIBA Perfusion, Diffusion and Flow – MRI Biomarker Committee (BC) Update Call

Wednesday, March 30, 2016 at 11 AM (CDT)

Call Summary

Participants			**RSNA**
Michael Boss, PhD (Co-Chair)	Bradley Erickson, MD, PhD	Savannah Partridge, PhD	Joe Koudelik
John Kirsch, PhD (Co-Chair)	Jacob Fluckiger, PhD	James Provenzale, MD	Susan Weinmann
David Bennett, PhD	Daniel Gembris, PhD	Walter Schneider, PhD	
Ryan Bosca, MS	Tomas Gudauskas, MD	Suraj Serai, PhD	
Orest Boyko, MD	Wei Huang, PhD	Kyunghyun Sung, PhD	
Mark Brown, PhD	Edward Jackson, PhD	Brian Taylor, PhD	
Thomas Chenevert, PhD	Daniel Krainak, PhD	Junqian (Gordon) Xu, PhD	
Caroline Chung, MD	Hendrik Laue, PhD	Qing Yuan, PhD	
Vadival Devaraju, PhD	Elizabeth Mirowski, PhD	Xiangzhi Zhou, PhD	
Timothy Dondlinger	Nancy Obuchowski, PhD	Yuxiang Zhou, PhD	

Moderator: Dr. Boss

QIBA PDF-MRI BC & EIBALL (Dr. Jackson)

- Approximately two months ago, QIBA leadership spoke with Dr. Golay from Gold Standard Phantoms Limited regarding a potential collaboration between the PDF-MRI BC with the European Imaging Biomarkers Alliance (EIBALL) on the establishment of ASL as a biomarker
- This international collaboration may be discussed at the QIBA Annual Meeting in April and/or at the May ISMRM meeting

Round 6 Proposals

- DCE-MRI TF (Dr. Sung)
    - Project Title: Evaluation of RF transmit calibration options for quantitative DCE-MRI
    - Participants: Dr. Kirsch, Dr. Coolens & Mr. Bosca, Drs. Boss, Sung and Nayak
    - Roles of each participant were outlined
    - Motivation:
        - DCE-MRI v2.0 profile will include 3T
        - Intra-subject coefficient of variation of DCE-MRI metrics at 3T is poor (>40%) without transmitted RF (B1+) filed calibration
        - When unaccounted for, B1+ variation causes errors in pre-contrast T1 maps and errors in the conversion of S.I. to [Gd]
        - To make the profile more useful, the amount of B1+ variation on different 3T platforms will be determined and practical ways for clinical sites to correct for B1+ variation will be identified
    - The plan and timeline were proposed and scan sites were chosen:
        - Siemens scanner at UCLA
        - Philips scanner at CHLA
        - Toshiba at USC
    - Expected outcomes and pros & cons were listed

- Concern was raised regarding temperature control
    - There was discussion on temperature dependence
    - It is possible to monitor temperature
    - Flow-related phenomena can cause errors in estimations

- Literature Search (Dr. Laue)
    - Project Title: Reproducible literature search for quantitative biomarkers on the example of DCE and DSC-MRI
    - Participants/contributors: Drs. Wu (Harvard Medical School), Chung (MD Anderson), Shiroishi (University of Southern California) and Laue (Fraunhofer MEVIS)
    - DCE Profile and Claims depend on literature review findings
    - While it is important to find all relevant publications, there is a need for an efficient process to refine search results
    - Best practices for 'quantitative' literature review need to be defined
    - Because literature review best practices may be applied within any QIBA group, this will be submitted as a cross-modality proposal
    - It was suggested that PIs on this project reach out to other cross-modality project leaders (e.g., Dr Barboriak) for input
    - A statistician will be consulted (Dr. Obuchowski offered her assistance)
    - Extensive literature searches have been conducted by both the DCE and DSC TFs
        - Two different strategies are being used:
            - Collaborative spreadsheets (web-based & allows multiple people to edit the same file in real time – ex. Google Sheets)
            - Literature management software (Zotero)

        - Tools and workflows for handling large numbers of publications are being created
        - Software will be developed to manage literature citations, though it is beyond the scope of this project proposal

    - Objectives:
        - Complete comprehensive, systematic literature searches
        - Develop a framework and methodology for reproducible literature searches on quantitative imaging biomarkers
        - Develop efficient, supportive tools that enable coordinated multi-reviewer activities

    - Deliverables:
        - Prepare and publish results of DSC and DCE literature search
        - Literature search manuals:
            - White paper for quantitative search
            - Manual for application-based search
            - Manual for spreadsheet-based approach
            - Checklist for future searches

        - Development of collaborative tools:
            - Convert spreadsheet to database
            - Convert database to spreadsheet

- DTI (Dr. Provenzale)
    - Project Title: High temporal resolution cross 1.5T/3T imaging of the DTI/Universal phantom
    - PIs: Drs. Provenzale & Schneider
    - There is an emphasis on examining data from “routine” or commonly-used scanners
    - Performance Profiles of 4 MR scanners at Duke University will be assessed using hardware and software that are representative of typical DTI imaging procedures currently performed The scanners used are: Siemens Aera and a GE 450W; the CAMRD scanner and a 3T Siemens
    - Process will include a round robin weekly testing across the 4 scanners
    - Will use the VA/ALDIT DTI and universal phantom provided to the effort at no cost
    - The phantom will allow project PIs to determine the ability of the high-end scanners to reflect output values that would be expected by following a QIBA Profile, i.e., based on a phantom/ground truth comparison
    - Intent is to study inter & intra scanner variability
    - Objectives were highlighted
    - Dr. Jackson noted that since this is a short-term funded project, deliverables will need to be refined and targeted toward how the project will impact the DTI Profile and Claims
    - It needs to be understood how a scan can be performed on different scanners and receive the same results; protocols need to be developed to minimize the differences between scanners
    - The focus should be on quantitative imaging biomarkers of interest and how they will go into the Claim statement and how reproducibility and ground truth will be established

Next PDF-MRI Biomarker Committee Call: April 27, 2016 at 11 AM CDT