

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

Wednesday, May 24, 2017 at 11 AM (CT)

Call Summary

### Participants

<i>Daniel Barboriak, MD (Co-Chair)</i>	Edward Jackson, PhD	Walter Schneider, PhD	<b>RSNA</b> Joe Koudelik
<i>Michael Boss, PhD (Co-Chair)</i>	Daniel Krainak, PhD	Samir Sharma, PhD	Susan Weinmann
Mark Brown, PhD	Eleni Liapi, MD, ScM	Ying Tang, PhD	
Thomas Chenevert, PhD	Dariya Malyarenko, PhD	Ona Wu, PhD	
James Ewing, PhD	Nancy Obuchowski, PhD	Junqian (Gordon) Xu, PhD	
Daniel Gembris, PhD	Julia Patriarche, PhD	Robert Young, MD	
Gloria Guzman, MD, MSc	James Provenzale, MD	Gudrun Zahlmann, PhD	
Wei Huang, PhD	Mark Rosen, MD, PhD		

*Moderator: Dr. Boss*

### QIBA Annual Meeting Debrief

- Discussion of the Public Comment Process, which can be found on the QIBA Wiki at: [http://qibawiki.rsna.org/index.php/Public\\_Comment\\_Process](http://qibawiki.rsna.org/index.php/Public_Comment_Process)
- The RSNA increased its allocation for QIBA to assist with shortfall in the budget as a result of the loss of NIBIB funding
- There are 13 QIBA Biomarker Committees and 19 Profiles in progress
- Clarification of Profile stages and required criteria is needed – the current explanation can be found on the QIBA Wiki at: [http://qibawiki.rsna.org/index.php/QIBA\\_Profile\\_Stages](http://qibawiki.rsna.org/index.php/QIBA_Profile_Stages)
- New QIBA groups have been rapidly advancing due to the efforts of the QIBA Process Committee and Dr. Obuchowski, including:
  - Standard language for Claim Statements, found in the current Claim Guidance document
  - Profile template
  - Both of the above documents can be found on the QIBA wiki at: [http://qibawiki.rsna.org/index.php/Process\\_Coordinating\\_Committee](http://qibawiki.rsna.org/index.php/Process_Coordinating_Committee)

### DTI TF Update (Drs. Provenzale & Schneider) **\*some information taken from presentation slides**

- Two DTI TF subgroups are active
  - Clinical Review of Literature subgroup led by Dr. Provenzale
    - Composed of three nationally-recognized leaders in clinical and research applications of DTI
    - Seeking to understand the extent to which DTI is clinically robust; literature search on the topic of DTI reproducibility is underway
      - Review process began in February, 2017
      - Two articles per month are assigned to each of the three TF members
      - Members record the following on a scoresheet:
        - Study findings and study limitations
        - Usefulness for purposes of the Profile
        - Actual Claims about DTI reproducibility

- To date, 18 articles have been reviewed and all were deemed useful for inclusion in the literature review
  - TF members, as well as PDF-MRI BC members encouraged to submit applicable articles to Dr. Provenzale at [james.provenzale@duke.edu](mailto:james.provenzale@duke.edu)
  - Review process to continue until at least December, 2017
- Quantitative Measurements subgroup led by Dr. Schneider
  - Update provided on Dr. Schneider's QIBA Round-6 Project titled, "Measurements of Reproducibility of DTI Metrics on Clinical MR Scanners Using a DTI Phantom"
    - Phantoms are being scanned on seven different scanners at Duke: five Siemens and two GE
    - Have met with GE, Siemens and Philips reps, who will be participating in the phantom scanning program and reviewing analysis methods and data sets
    - Phantom to be used to quantify and correct systematic bias across multiple vendor platforms
    - DTI Profile to be the standard, or benchmark of future imaging performance
- Profile Progress Update
  - Profile language is being drafted
    - Methods to deal with the substantial systematic bias problem is being discussed with Dr. Obuchowski; solutions expected this summer
    - Reference data for 25 scanners on related metrics in the phantom assessment program to be obtained
  - DTI metrics and more modern compartmental metrics (e.g., NODDI based) that appear to be less sensitive to SNR spatial problems to be contrasted
  - The new generation of high channel head coils are introducing dramatic spatial inhomogeneity in SNR
  - Profile progress to result in a series of recommendations on scanner monitoring and QA measures to reduce systematic bias/repeatability error
  - Literature review to be supported by phantom analysis
  - Close evaluation of scanners to be indicated to users
  - Discussion ensued regarding important distinctions between a Profile and a white paper
    - Phantom work is a critical component in obtaining prospective data through groundwork projects in addition to existing literature
    - A Profile is based on existing literature, as well as data obtained as a result of groundwork projects
    - Hope to draft Claims with documented quantification by September to have committee review of the Claims and approach
    - It is not requirement to find data in existing literature; Claims may be based solely the research conducted by QIBA Project PI(s)
    - Dr. Obuchowski explained the following QIBA terms and concepts, which can be found on the QIBA Wiki at: [http://qibawiki.rsna.org/index.php/Claim\\_Guidance](http://qibawiki.rsna.org/index.php/Claim_Guidance)
      - Longitudinal Claim (recommended for the DTI TF Profile)
      - Cross-Sectional Claim
      - Repeatability
      - Reproducibility

- MRI Quarterly Assessment Diffusion Phantom Program Update
  - The Brain Imaging Quantitative Assessment Program (BIQAP) is a national, voluntary program to assess and improve the quality of MRI brain imaging in research and clinical studies nationwide, provided and supported by the VA Office of Research Development, Department of Defense Medical Health, and NIST
  - The goal is to quantitatively assess the quality of brain imaging on a national scale in leading universities, VA centers and TriCare MRI imaging research centers
  - Represents a major opportunity for QIBA to quantify the between-instrument variability due to systematic bias and work with vendors and university centers to reduce the error in future scanner measurement
  - Study is deemed a good opportunity to move quantitative imaging into the MR field
  - Sites that wish to enroll will be requested to perform QC by scanning of a diffusion phantom using a two-hour imaging protocol once per quarter
  - PIs of the project are:
    - Walter Schneider (University of Pittsburgh)
    - James Provenzale (Duke University)
    - Michael Boss (NIST)
    - Elisabeth Wilde (Houston VA & Baylor University)
  - Currently, funding for the efforts via DoD, VA, and NIH is not sufficient
  - In support of DOD reporting requirements and request for continued funding, a letter of support from QIBA leadership to be requested from Drs. Jackson & Guimaraes
  - Dr. Schneider to provide additional program details

#### Upcoming PDF Task Force Updates:

- June 21: DWI Task Force
- July 5: DSC Task Force
- July 19: DCE Task Force
- August 2: ASL Task Force
- August 16: DTI Task Force

**Next PDF-MRI BC Call:** Wednesday, June 21, 2017 at 11 AM CT

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