QIBA Musculoskeletal (MSK) Biomarker Committee (BC) – Leadership Call

Tuesday, July 18, 2017 at 10 AM CT

Call Summary

In attendance			**RSNA**
Xiaojuan Li, PhD (Co-Chair)	Edward Jackson, PhD	Edwin Oei, MD	Julie Lisiecki
Thomas Link, PhD, (Co-Chair)	Youngkyoo Jung, PhD, DABR	Rob Peters, PhD	Susan Weinmann
Michael Boss, PhD	Leon Lenchik, MD	Hollis Potter, MD	
Robert Boutin, MD	Quin Lu, PhD	Ravi Regatte, PhD	
Christine Chung, MD	Nancy Obuchowski, PhD	Carl Winalski, MD	
Alexander Guimaraes, MD, PhD			

Moderator: Dr. Link

Welcome / Introduction

- Background information was distributed including:
  - A review paper on quantitative cartilage imaging biomarkers prepared by Drs. Li & Link
  - As the most mature QIBA Profile, the FDG-PET Profile to be used as a template for the MSK Profile

- Development of phantom to calibrate across sites and scanners
  - Steps have been taken to look into funding
  - Dr. Peters presented his work on a cylindrical phantom for cartilage T2 measurements with six vials containing agar gel which will be developed through the GE/National Basketball League Initiative and will be distributed to the different participating sites. As a first step the committee will look at the feasibility of adapting this phantom and its early use in the GE/NBA research studies. Potentially this phantom will be applied to early cross-calibration studies within the QIBA related work.
  - Dr. Li to meet with Drs. Keenan & Boss from NIST to discuss possible NIST involvement in phantom development

- The short-term goals are to:
  - Work on a meta-analysis focusing on reproducibility (Drs. Li and Obuchowski)
  - Work to identify the claims/applications as outlined by the committee (Dr. Link)
  - Develop a T1rho and T2 phantom, as outlined above
  - As a second step to standardize sequences for T1rho/T2 measurements that can be used across different sites and between vendors.

- The long-term goal is to create the complete QIBA Profile for T1rho/T2 of cartilage
  - Discussion on what to measure/clinical applications and claims included the following:
    - Disease burden of early degenerative disease to be quantified- cross-sectional claim likely not possible because of lack of ground truth
    - Use of a Z-score instead of absolute values to measure cartilage degeneration with T2 and T1rho (to be circulated) may be too complicated and likely better to start with simpler measures as this would require a large normative database
    - Use DXA, dual-energy X-ray absorptiometry measurements to measure bone mineral density as a model
    - Definition of biomarker scope and utilization needs to be established
    - Claim to center on prognosis of disease was suggested by the committee

        - Applications discussed were early diagnosis, treatment, prediction (i.e., patient predisposition to disease) & using in clinical trials to target early disease

- MSK BC Claim to be based on literature review and a groundwork project
    - To show that T1rho and T2 MR measurements are reproducible
    - Separate Claims on repeatability and reproducibility to be developed
    - Dr. Obuchowski suggested focusing on longitudinal change between two time points, which is recommended when true change is unknown, per the Claim Guidance document located on the QIBA Wiki at: http://qibawiki.rsna.org/index.php/Claim_Guidance
    - First longitudinal claim could be an analysis of the rate of disease progression within a subject
        - As setting a definitive, standard value across a large cohort of people is problematic
        - Stability of measurement over time to be assessed, as well as variation across scanners
    - Second claim could focus on risk prediction and also response to treatment

- Next Steps:
    - Conduct literature search, meta-analysis, to assess reproducibility (with assistance from Dr. Obuchowski)
    - Phantom development
    - Claim development - start working on profile through drafting clinical applications and claims as a first step using FDG-PET Profile as a template and using http://qibawiki.rsna.org/index.php/Claim_Guidance
    - Standardize sequences
    - Establish working groups (TFs)

More information is available in the following locations:

- https://www.rsna.org/QIBA/
- https://www.rsna.org/QIBA-Profiles-and-Protocols/
- https://www.rsna.org/QIBA-Process/
- http://qibawiki.rsna.org/index.php/Profiles
- http://qibawiki.rsna.org/index.php/QIBA_Profile_Template
- http://qibawiki.rsna.org/index.php/Profile_Conformance

Please see the posted items on the QIBA wiki for details:

- MSK site
- Process Committee wiki page
- Process Committee Profile Template and Claim Guidance
- Introduction to QIBA Presentation from Dr. Jackson: Parts I and Part II

Recommended QIBA Contacts (RSNA Staff can provide emails)

- Mr. Kevin O'Donnell (QIBA Process Committee Chair)
- Dr. Nancy Obuchowski (QIBA Statistician)
- Dr. Chenevert (QIBA MR Scientific Liaison)
- Dr. Nicholas Petrick (FDA)
- Dr. Michael Boss (NIST)

- Drs. Erickson and WU (working on the DSC - MRI Susceptibility Phantom)

➢ **If you plan to attend the 2017 RSNA Annual Meeting, the QIBA Working Meeting will be held on Wednesday, November 29, 2017, 2:30 – 5 PM**

Next Call: Tuesday, September 19, 2017 at 10 AM CT [No meeting in August, due to schedule conflicts]

RSNA Staff attempt to identify and capture all committee members participating on WebEx calls. However, **if multiple callers join simultaneously or call in without logging on to the WebEx, identification is not possible.** Call participants are welcome to contact RSNA staff at QIBA@RSNA.org if their attendance is not reflected on the call summaries.