

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

Tuesday, September 19, 2017 at 10 AM CT

### Call Summary

#### In attendance

Thomas Link, PhD, (Co-Chair)  
Robert Boutin, MD  
Christine Chung, MD  
Edward Jackson, PhD  
Youngkyoo Jung, PhD, DABR  
Rick Kijowski, MD

Leon Lenchik, MD  
Tim Mosher, MD  
Nancy Obuchowski, PhD  
Rob Peters, PhD  
Hollis Potter, MD

Ravi Regatte, PhD  
Mark Rosen, MD, PhD  
Carl Winalski, MD  
Cory Wyatt, PhD  
Gudrun Zahlmann, PhD

#### RSNA

Joe Koudelik  
Susan Weinmann

**Moderator:** Dr. Link

#### Welcome / Introduction

- Due to schedule conflicts, there was no MSK BC call in August

#### Phantom Development

- Dr. Li met with Dr. Keenan from NIST to discuss possible NIST involvement in phantom development
- Meta-analysis paper on cartilage compositional biomarkers reviewed by Drs. Li and Obuchowski, focusing on reproducibility will be published within the next few months and will provide material required for review of T2/T1rho imaging biomarkers.
- Multi-vendor, multi-site study to be funded by arthritis foundation
  - Fifteen phantoms have been ordered in support of this study
  - Phantom specifications are from UCSF
  - Dr. Li has ordered additional phantoms and should receive them near the end of September
  - Aim is to standardize protocols and perform cross-validation of cartilage T1rho/T2 values in phantoms and human subjects between sites (four) vendors (GE, Siemens, Philips)

#### RSNA 2017 Annual Meeting (McCormick Place Convention Center - Chicago)

- Poster content expected to be collected by mid-September with poster creation and review by October 25<sup>th</sup>, and submission to RSNA staff no later than October 31
- Dr. Link to circulate draft poster to MSK BC members for input prior to submission to RSNA staff
- Drs. Mosher and Link have signed up for lunchtime Meet-the-Experts poster sessions at the QIBA Kiosk in the Learning Center, Hall D; others are encouraged to sign up at on the Google Sheet at:  
[https://docs.google.com/spreadsheets/d/1Q\\_vIHEn7Bb1iBimw2OcnvnDGau-6f4Fm5INq58hRQ8/edit#gid=359662456](https://docs.google.com/spreadsheets/d/1Q_vIHEn7Bb1iBimw2OcnvnDGau-6f4Fm5INq58hRQ8/edit#gid=359662456)
- While Dr. Link is unable to attend the November 29 QIBA Working Meeting (2:30 – 6:00 pm), others are encouraged to attend and may RSVP at: <https://goo.gl/forms/DDmupbfSBaJz3cOX2>
- MSK QIBA committee members Drs. Link, Chung and Potter will present RSNA Osteoarthritis course: Beyond the Basics course to be held at 8:30 am on Friday, December 1; add the course to “My Agenda” by visiting the RSNA website at: <https://meeting.rsna.org/program/>

## Claims Development

- With reference to the Claims Guidance document on the QIBA Wiki at: [http://qibawiki.rsna.org/index.php/Claim\\_Guidance](http://qibawiki.rsna.org/index.php/Claim_Guidance), Dr. Link began working on the Profile through drafting clinical applications and claims as a first step using FDG-PET & MRE Profiles as references/templates. A draft will be distributed to the committee members.
- MSK Claims to be based on literature review and a groundwork project and will focus on reproducibility & measuring change
- Dr. Obuchowski provided an overview on types of claims and their uses and gave input on claims drafted by Dr. Link
- Suggestion to focus 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](http://qibawiki.rsna.org/index.php/Claim_Guidance)
- T1rho & T2 measurements to be included within separate Claims.
- Clinical value of T1rho to be determined.
- Claims to address how measurement should be performed, as it will impact quantitation
- The second step is to provide clear recommendations for the technique (under Section 3: Profile Activities)
- Dr. Obuchowski advised that the claims be straightforward and address sub regions and sub compartments
- Discussion of how reasonable changes of 11 – 13% are in certain areas.
- Decision to include only two Claims for the present time; may optimize and refine in the future as more information becomes available
- First longitudinal claim could be an analysis of the rate of disease progression within a subject
  - 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
- Claim #1: Technical performance claim to avoid between-patient variability
- Claim #2: Repeatability claim focusing on risk prediction and response to treatment
  - Equation in Claim template document was used
  - Discussion on repeatability and ways to deal with clinical change
  - Reproducibility is not better than 4-5% based on studies reviewed by Dr. Link
  - Need to stratify the reproducibility based on severity of disease
  - Dr. Link to address the issue of disease severity
    - Discussion on the best method to stratify in order of severity; qualifier to be added along with a link back to recommendations
    - Other QIBA Profiles are stratified by organ and some by severity (size of lesion)
    - Since thickness of cartilage is very variable, an independent stratifier is needed
  - **Absolute change** to be measured, i.e. without regard to an “increase” or “decrease”
  - Dr. Link to return to scientific studies and look at individual measurements instead of averages
  - Use of a Z-score instead of absolute values to measure cartilage degeneration with T2 and T1rho may be too complicated; it is likely better to start with simpler measures as it would otherwise require a large normative database
  - Animal models performed by Dr. Potter may be used to validate technique and referenced in the Appendices

- Most QIBA Profiles focus on commercially-available quantitative biomarkers, e.g. T2
  - If T1rho is pursued, this will need to be added to the “Open Issues” section of the Profile since it is not commercially-available at this time
- Address segmentation tools (manual and automatic)
- Agreement reached that it is too early to discuss kinds of abnormalities to include in Claims
- Dr. Obuchowski explained how to validate cut point; more information is located in the Claim Guidance document on the QIBA Wiki at: [http://qibawiki.rsna.org/index.php/Claim\\_Guidance](http://qibawiki.rsna.org/index.php/Claim_Guidance)

### Next Steps

- Dr. Link to send articles he has reviewed for developing claims to Dr. Obuchowski
- Dr. Link to create a MSK BC Drop Box, in which to store literature and documents and send link and message to RSNA staff for distribution
- Dr. Link will circulate poster for input before finalizing
- Dr. Link will send drafts of claims for feedback to RSNA staff for circulation

**Next Call:** Tuesday, October 17, 2017 at 10 AM CT

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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](mailto:QIBA@RSNA.org) if their attendance is not reflected on the call summaries.

### SAVE-THE-DATE:



**QIBA Working Meeting at RSNA 2017 | Wednesday, November 29, 2:30-6 pm – Lakeside Center**

**RSVP at:** <http://tinyurl.com/2017-QIBA-Working-Meeting!>