QIBA Musculoskeletal (MSK) Biomarker Committee (BC)
Tuesday, March 19, 2018 at 10 AM CT [regular time slot]

Call Summary

In attendance
Xiaojuan Li, PhD (Co-Chair) | Peter Hardy, PhD | Rob Peters, PhD | Joe Koudelik
Thomas Link, PhD (Co-Chair) | Edward Jackson, PhD | Hollis Potter, MD | Susan Stanfa
Michael Boss, PhD | Youngkyoo Jung, PhD, DABR | Ramya Srinivasan, MD
Angie Botto-van Bemden, MD | Leon Lenchik, MD | Carl Winalski, MD
Robert Boutin, MD | Vladimir Mlynarik, PhD | Cory Wyatt, PhD
Christine Chung, MD | Nancy Obuchowski, PhD | Gudrun Zahlmann, PhD
Garry Gold, MD

RSNA

Moderator: Dr. Link

Update on March 14 QIBA MR Coordinating Cmte T-con

- Dr. Link provided an overview from the MR CC call summarizing all MR BC & TF activities and gave an update on their various Profile development stages
  - The full QIBA organization chart can be found on the QIBA Wiki at: https://tinyurl.com/QIBA-Org-Chart
- There was a discussion on MR publications status and next steps in efforts to enhance the Profile

Arthritis Foundation Calibration Study Activities (Dr. Li)

- The Arthritis Foundation calibration study and its results are crucial for MSK Profile development
- The first set of phantom data is now being analyzed
- After analysis is complete, phantom data will be reported to the study committee and the MSK BC
- Sequence standardization and measurement across multiple sites and vendors will be a challenge
  - Once variability is assessed, differences will be optimized and minimized
  - The hypothesis is that there may be systematic differences seen across sites and scanner vendors which may require a correction factor
  - Once it is determined whether the cross vendor correlation is linear, a correction factor can be developed

MRI Phantom Development

- Drs. Mirowski at QalibreMD (an offshoot of High Precision Devices), Keenan from NIST, and Li are collaborating on phantom development
- Dr. Mirowski plans to submit a NIH/SBIR grant application (to develop a phantom) by the April 4 deadline
- Discussion on machine-learning and how one would develop automatic imaging segmentation for cartilage
  - The number of abstract submissions on machine-learning has increased
  - Those working in this area of interest to be invited to become members of the MSK BC

Osteoarthritis Research Society International (OARSI) Image Interest Group

- This new forum could be leveraged to increase the visibility of QIBA’s MSK quantitative efforts
- An understanding of the underlying physics of imaging is critical for participation in deep-learning efforts; active radiologist members are crucial to the group
- Caution was voiced regarding the use of machine learning technology by novices or non-SMEs
• Discussion on synthetic MR; Dr. Peters explained this technology and its function
• The major scanner vendors all have their own versions of Synthetic MR
• Recommendations for sequences outside of relatively standard approaches were requested
  o Scan time efficiency is driving the machine-learning trend
  o Finding multiple uses of output data also benefits from machine-learning
  o MSK Profile to promote use of 3D acquisition for quantitative MR

Potential Publications
• The Arthritis Foundation calibration study to conclude by September 2018 and a paper to be submitted for publication
• Suggestion to develop MSK TFs for writing white papers
• Opportunities for QIBA-generated publications need better organization and coordination; members are encouraged to inform QIBA leadership before submitting articles for publication in order to present a united front with a cohesive message and consistent language
• Series of papers to possibly be published by JMRI could make QIBA more recognizable to community by emphasizing QIBA-supported trials and QIBA participation in studies
• It must be clear that this effort is being driven by the radiology field, not other areas of medicine

Next Steps
• Recommendations for subject-handling to be discussed
• Creation of data sets to help streamline the reconstruction and data analysis
• Use of the automatic algorithms to be investigated further
• Dr. Link encouraged MSK BC members to attend the Osteoarthritis Research Society International (OARSI) Meeting in Liverpool during the second half of April
  o Goal is to develop the image interest group as a forum for imaging researchers
  o There will be a need for co-chairs (3-year terms) and 5 – 6 people to plan yearly 90-minute image interest group meeting
  o Cutting edge developments and novel abstracts to be included in program.
  o There will be 1 – 2 regular talks, a review of 5 – 6 short abstracts and research discussion
  o Dr. Link will maintain the group roster and distribute yearly invitations and papers for those who are unable to attend the meeting

Next Call: Tuesday, April 17, 2018 at 10 AM CT [regular time slot]; no May meeting due to QIBA Annual Meeting

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