

QIBA Diffusion-Weighted Imaging MR Biomarker Committee (BC) Meeting

Tuesday, January 24, 2023, at 1 pm (CT)

Meeting Summary

Participants

Michael Boss, PhD (Co-chair)

Dariya Malyarenko, PhD (Co-chair)

Trevor Andrews, PhD

Rajpaul Attariwala, MD, PhD

Thomas Chenevert, PhD

Amita Shukla Dave, PhD

Nandita deSouza, MD

Moti Freiman, PhD

Daniel Margolis, MD

Kevin Miller, MS

Savannah Partridge, PhD

Dafna Sourani-Link, PhD

Jessica M. Winfield, PhD

RSNA

Susan Stanfa

Topics:

- DWI leadership
- QIBA-related RSNA 2022 Annual Meeting events
- Update on Profile revisions
- Whole Body DWI Profile Proposal

Next Steps / Action Items:

Announcements

- Dr. Daniel Margolis, clinical radiologist, agreed to serve as the 3rd DWI BC Co-chair; his term officially began on January 24, 2023

Debrief of MR Breakout Session Discussion following the Nov 30th. Quantitative Imaging Symposium: Sponsored by QIBA

- Advancement to stage 3; adoption of the new Profile template to occur in 2023 following the publication of the first iteration of the stage 3 Profile (ver. Dec. 2022)
- Discussion on departure from the use of an ice water phantom
 - Ice water phantoms were designed to assess the tactical performance across scanners, which is useful in a multicenter trial; they were also used to assess biases and obtain an estimate of baseline repeatability
 - CaliberMRI introduced thermometry components into the phantom that allows temperature to be assessed using look-up tables of ADC Values as a function of temperature, courtesy of NIST
 - Holz, et al. [Temperature-dependent self-diffusion coefficients of water and six selected molecular liquids for calibration in accurate 1H NMRPFG measurements](#). 2000.
 - Language to be adjusted in 2nd iteration of stage 3 Profile to reflect use of a different phantom with NIST ADC data
 - Bias in terms of linearity or offset will become increasingly important moving towards cross sectional Claims
 - Distinct protocols for phantoms vs. human subjects needed so repeatability in patients can be determined
 - Performance metrics and thresholds at room temperature will need to be established
- Dr. Suchandrima Banerjee presented an in-development GE noise reduction algorithm
 - Would be used to employ AI algorithms to reduce noise, then to generate quantitative images
 - Consideration needed re: general impact of these algorithms, how they are being validated, and whether they have impact on the QIB of interest, i.e., whether they change the reproducibility of a biomarker
 - **Dr. Dave to send Dr. Banerjee's contact information to Dr. Boss; she will be invited to present this topic during the Feb. 28 call**
 - Other vendors have comparable products in development – **Canon, Hitachi, and Siemens to be contacted**

Profile

- Minor adjustments will be made, and the Profile will be sent to staff for DWI BC distribution
 - **MOTION APPROVED** to publish the DWI BC stage 3 Profile
 - Dr. Andrews moved, seconded by Dr. Attariwala to approve the stage 3 Profile for publication as Clinically Feasible
 - The motion passed unanimously with 13 votes in favor, 0 against, 0 abstentions, and 0 recusals
- To include all DWI BC members with voting privileges in the final decision, **staff to also initiate an BC eballot vote-to-publish the Profile as Clinically Feasible (Stage 3); an MR CC ballot will follow**
- The next step is to adopt the new streamlined Profile template in the 2023 version of the stage 3 Profile, priming the Profile for future directions and growth, e.g., incorporating cross-sectional Claims, kertososis imaging, etc.
- White Paper progress to continue in parallel with Profile efforts

Whole Body DWI – Next Steps

- If approved by the SC, this would be a separate BC effort and DWI BC SMEs would be valuable and welcome
- First step: draft 2 – 3-page proposal that would fit into the [New Biomarker Cmte Application Form](#)
 - Defined QIBs and proof of sufficient amount of test-retest data on which to base Claims are needed
 - Proposals should include descriptions on how the biomarker would meet the criteria: (1) transformational, (2) translational, (3) feasible, (4) practical, and (5) collaborative
 - Biomarker use-case specifications need to be provided
 - An MR CC vote to recommend the Hyperpolarized 129Xe MRI proposal for SC consideration is underway
- DWI BC members interested in participating in this effort should contact [Dr. Attariwala](#)
- QIBA call time to be established only after a completed MR CC evaluation and SC assessment of RSNA resources needed to support the initiative
- **Drs. Boss and deSouza to help with proposal development**

Next DWI-MR BC Meeting: Tuesday, February 28, 2023, at 1 p.m. (CT)

Participants are welcome to contact RSNA staff at qiba@rsna.org if their attendance is not reflected in meeting summaries.