

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

Thursday, September 16, 2021, at 2 pm (CT)

Call Summary

Participants

Michael Boss, PhD (Co-chair)
Trevor Andrews, PhD
Rajpaul Attariwala, MD, PhD
Ishtiaq Bercha, MSc, MSEE

Madeline Carr, BS (PhD Candidate)
Thomas Chenevert, PhD
Amita Shukla Dave, PhD

Daniel Margolis, MD
Kevin Miller, MS
Savannah Partridge, PhD

RSNA

Joe Koudelik
Susan Stanfa

RSNA Staff attempt to capture all committee members participating on Zoom calls. However, if attendees join only by phone, or do not use a recognizable name, identification is not possible. Participants are welcome to contact RSNA staff at qiba@rsna.org if their attendance is not reflected on the call summaries.

Review of Previous Call Summary

- The notes from the August 19, 2021, DWI BC t-con were approved as presented

September 14 QIBA Annual Meeting: Partial Conformance Panel Discussion

- BCs were encouraged to reduce checklist items by assessing them in terms impact on performance (ability to meet Claim)
- There was consensus that excessive specifications in QIBA Profiles make it unlikely for most sites to conform
- Reasons why sites may not meet checklist requirements and how BCs should address those situations was discussed
- The Profile-writing process typically begins with a literature review resulting in a long list of specifications that may not have originated from carefully controlled experiments to determine the influence of each variable; there is a lack of discernment between best practices and requirements that impact a site's ability to meet the Claim
- Suggestion to reduce checklist items to only the most crucial (directly affecting the Claim), with best practices residing in the appendix; best practice items can be returned to the checklist once supporting evidence of significant impact on performance has been obtained
- Feedback from entities outside of the QIBA community has indicated that Profiles are too long, and the number of checklist specifications needs to be reduced to decrease the burden on sites

VERDICT Collaboration Update (Dr. Chenevert)

- A retrospective analysis of recently published study data was done; data were collected on 40 subjects using protocols similar to the DWI Profile
- VERDICT requested DWI BC opinion on acquisition protocol and a response was provided to them; the reordering of B-values is being narrowed down to make the study more feasible
- Study results will help inform the next PIRADS version, establish more precise protocols for prostate cancer imaging, and phantom results and analysis will be used to form a DWI Profile cross-sectional Claim on prostate

Towards Quantitative MRI for Radiotherapy: Variability in DCE and DWI MRI

- Madeline Carr, PhD Candidate at Ingham Institute for Applied Medical Research (Sydney, Australia) presented on the use of the QIBA Diffusion Profile for CNS, HN, gynae, prostate, lung, and whole-body
- Interest in conformance was based on assurance in the reliability of qMRI values derived and the future possibility of using imaging biomarkers to assess treatment response
- QIBA DWI certification via self-attestation will be used to
 - Prove to their department that ADC is a reliable biomarker able to be derived on their scanner
 - Use results to approximate uncertainties in retrospective patient ADC studies
 - Show feasibility/ease of attaining certification to their collaborating departments and encourage them to participate in conformance testing
 - Provide evidence of ADC reliability for future multicenter DWI volunteer/patient trials, e.g., ethics approvals, grant applications, etc.

- Analysis included the use of Python code developed in-house; software dependence was assessed using QIDW DROs, qCal (CaliberMRI Colorado, United States), and QIBAphan
- Measurement linearity and bias were good, i.e., repeatability and reproducibility results were found within Profile tolerance
- One of the biggest challenges was that due to the absence of options on available automated software (qCal, QIBAphan) and lack of instructions in the Profile for using the NIST phantom for this purpose, spatial dependence testing was difficult to implement; additional observations were reported as well
- Future work includes achieving QIBA Certification, submitting a conformance manuscript for publication, completing conformance testing on all Australian MRI Linacs' plus MRI scanners in collaborating departments, and finally, submitting PhD thesis

Next DWI-MR BC Call: Thursday, October 7, 2021, at 2 pm (CT)