QIBA Dynamic Contrast-Enhanced (DCE) MRI Biomarker Committee (BC) Call

Monday, August 3, 2020 at 11 am (CT)

Call Summary

In attendance			**RSNA staff**
Caroline Chung, MD (Co-Chair)	Hyunki (Harrison) Kim, PhD, MBA	Nancy Obuchowski, PhD	Joe Koudelik
Hendrik Laue, PhD (Co-Chair)	Annelise Malkus, PhD	Mark Shiroishi, MD	Susan Stanfa
Todd Jensen, PhD			

Review of the DCE-MRI Profile continued

Section 3.6. Protocol and Reconstruction Design

Image Acquisition Considerations: Signal saturation and non-linearity subsection

- Dr. Laue to add link to NIST Medical Imaging Phantom Lending Library to this section
- Updates will be made to the specification table for brain

Section 3.7: Subject Selection

- Dr. Chung to reference the DSC-MRI Profile for wording re: European Medicines Agency (EMA) guidelines regarding the use of GBCAs

Section 3.14: Image Interpretation

- Dr. Chung updated the description of criteria and procedures related to the clinical interpretations of measurements and images that are necessary to reliably meet the Profile Claim
- Drs. Obuchowski and Kim cautioned about stepping into the clinical and/or biology interpretation realm since this was deemed outside the QIBA scope
- Discussion re: other factors to include in image interpretation guidelines (e.g., artefacts, Ktrans map)
- Once Dr. Chung has referenced the comparable text in the DSC-MRI and DWI Profiles, Dr. Shiroishi to make updates

4.1 Assessment Procedure: R1/T1 Mapping accuracy and signal saturation

4.1.1 Testing T1 mapping sequence and algorithm validity and accuracy

- Dr. Laue replaced the recommendation from using the phantom prototype developed by QIBA to evaluate the suitability of MRI hardware and sequence, to the NIST Medical Imaging Phantom Lending Library

Section 4.1.3 Discussion on B1 mapping subsection

- DCE-MRI BC members reviewed and approved this section text as final

Appendices

Appendix B: Claim definition details

- Re: imaging settings for brain, Dr. Chung to double-check whether VIF fitted with a biexponential is truly measured for each patient

Appendix C: Detailed description of Image Analysis – Methods to be used

- A. Apply time-series motion correction to the dynamic data: organ-specific details were reviewed and updated
- B: Generate a native tissue T1 map using the VFA data: note to be added that the latter algorithm models the noise distribution of the MRI system less accurately and related citation will be included
- C: Convert tissue DCE-MRI signal intensity time-course data to concentration: equation to be updated

- D: Determine a vascular input function
    - The signal for the vascular input function can then be converted into concentration using the method described in section C in this Appendix
    - References needed re: use of commercial automatic detection methods
    - Extensive discussion re: fully manual vs. semi-automatic vs. fully automatic VIF selection; there are variants across organ sites and no broad consensus
    - Reference Tissue Method and Fully Automatic Method were removed
    - Other references to be added
- E: Calculate the DCE-MRI imaging biomarker parameter maps
    - Considered removing this method, but decided to retain and wait for public comment feedback
- F: Identify the region or regions of interest: each guideline was closely reviewed

Appendix G: Acquisition Protocol

- Dr. Laue to discuss signal linearity text with Dr. Lavini; length to be reduced if possible

Appendix H: Vendor specific B1+ Mapping information for 3 Tesla (and higher)

- Dr. Nayak reviewed and suggested minor changes

Next Steps

- Dr. Chung to discuss section 3.14 with Dr. Shiroishi and Dr. Laue to consult Dr. Lavini re: Appendix G
- DSC-MRI and DWI Profiles to be referenced
- Profile edits and conformance checklist to be reviewed during the Aug. 17 call
- Dr. Chung to update and reformat doc for final BC review by the Aug. 31 call
- Official public comment version of the DCE-MRI Profile to be submitted to RSNA Staff
- RSNA Staff will circulate an email to BC members with voting privileges to obtain approval that the content of the Profile meets the criteria for the stage
    - The email will contain a link to the Ballot and have the profile will be attached
    - The ballot period is typically ~2 weeks to allow time to review the full Profile text
    - An email will also be sent to BC members without voting privileges, to notify them that the Profile has entered the approval stages for public comment
    - An MR CC vote will follow

Next call: Monday, August 17, 2020 at 11:00 am (CT)
