QIBA Dynamic Contrasted Enhanced (DCE) MRI Biomarker Committee (BC) Call
Monday, February 4, 2019 at 11 AM (CT)
Call Summary

Participants		RSNA
Hendrik Laue, PhD (Co-Chair)	Anthony Liu, PhD	Joe Koudelik
Wei Huang, PhD	Krishna Nayak, PhD	Susan Stanfa
Cristina Lavini, PhD	Kyunghyun Sung, PhD	

B1 Mapping Groundwork Project Update (Dr. Nayak)
- Inquiries have been submitted to vendor representatives to find out whether they plan to utilize B1 mapping correction within their analysis software
- The Round-6 project has been completed
    - Brain imaging phantom and torso phantom were developed; calibration processes differ based on organ systems
    - A corresponding manuscript has been reviewed for publication and revisions are underway

- B1 maps (of static phantom) from different scanners (including specific sequences utilized) to be uploaded to the Quantitative Imaging Data Warehouse (QIDW)
- The need for meticulous placement of each phantom within the scanner (coil), and resulting variability were discussed
- Dr. Nayak to circulate the two-month repeatability comparison figures from his manuscript
- Phantom data are needed for comparing results before a recommendation can be made in the Profile regarding B1 mapping; in the meantime, the DCE BC will proceed with a T1 mapping phantom
- Suggestion to provide vendors with recommendations on how to cope with B1 variability introduced by 3T scanners (1.5 T scanners do not introduce these B1 issues)
    - +/- 50% variability observed with the torso phantom (with 3T scanning)
    - +/- 20% variability observed with the head phantom (with 3T scanning)

- Next steps:
    - Decide how to include B1 in the DCE Profile
    - Provide B1 mapping data from the groundwork project
    - Request software description from vendors

R1 Phantom Availability (Dr. Lavini)
- Dr. Lavini is currently working with Gold Standard Phantoms on an ADC phantom which will cost ~$5,000 (not yet available)
- The DSC and DWI BCs worked with High Precision Devices (HPD) on ADC phantoms which cost ~$10,000; challenges were encountered with the stability of fill solutions
- Specifics regarding T1 or R1 reference values or ranges to be included in the Profile
- Characteristics and specifications of technical abilities of phantoms and/or software to be provided
- T1 & T2 phantoms deemed difficult to obtain due to cost and limited availability
- Phantoms for scanner calibration and vendor sequence checking must be adequate to test the Profile Claim(s)

DCE Profile Update (Dr. Laue) (Sections 3.3)

- This item was tabled until the February 18 DCE BC call
- DCE BC members are encouraged to review and comment on Profile at:
  https://docs.google.com/document/d/1in76va1Q96tVX97RWLHHqimOHxCeDsMqh98na8pwOb8/edit?usp=sharing

Software Requirements (DRO)

- There was discussion on requirements for accuracy; DROs are used to find ground truth
- Dr. Laue provided on brief overview of the QIBA DRO Evaluation Tool (QDET)
  - Import the calculated maps
  - Visualize results using:
    - Scatter plots
    - Box plots
    - Histograms
  - Create statistics:
    - Mean, SR, Max., Min values
    - Median, $1^{st}/3^{rd}$ quartiles
  - More statistics results:
    - Linear model fitting
    - Student t-test
    - Mann-Whitney U-test
    - ANOVA
    - Chi-squared test
  - Evaluation results
    - Example: mistaken time unit (minute instead of second)

- Measurement of bias and factors that affect the bias need to be described; Dr. Obuchowski volunteered to help with these statistical details
- Conformance with statistical assumptions is required by the QIBA process, with increasing rigor at each QIBA Profile Stage
  - Statistical assumptions and data need to be provided so that the user can make calculations and confirm assumptions were met
  - At the Public Comment Stage of the Profile, the procedures for assessing the statistical assumptions must be described in detail
  - The DCE Profile is based on a longitudinal Claim, which makes assumptions about the within-subject precision, property of linearity and regression slope
  - Dr. Laue to follow up with Dr. Obuchowski for additional information on this topic

Next DCE BC Call: Monday, February 18, 2019 at 11 AM CT