<p style="text-align:center"><strong>QIBA Dynamic Contrast-Enhanced (DCE) MRI Biomarker Committee (BC) Call</strong></p>
<p style="text-align:center">Monday, August 5, 2019 at 11 AM (CT)</p>
<p style="text-align:center">Call Summary</p>

**Participants**                                                                **RSNA**

*Caroline Chung, MD (Co-Chair)*   Cristina Lavini, PhD        Mark Shiroishi, MD        Susan Stanfa

*Hendrik Laue, PhD (Co-Chair)*    Susan Noworolski, PhD       Kyunghyun Sung, PhD

Michael Boss, PhD                 Nancy Obuchowski, PhD       Jinnan Wang, PhD

Moderator: Dr. Laue

**DCE Profile v2.0 Update: Claim Definition 3T for Prostate (Dr. Laue)**
- Overview provided re: The publication currently informing the Prostate Claim at 3.0T: Peled et al, 2018, **Selection of Fitting Model and Arterial Input Function for Repeatability in Dynamic Contrast-Enhanced Prostate MRI.** *Academic Radiology*, was briefly discussed
    - GE 3T
    - 11 patients
    - Patient averaged Arterial Input Function (AIF)

- Overview provided re: Fennessy et al, 2012. **QIN: Practical Considerations in T1 Mapping of Prostate for Dynamic Contrast Enhancement Pharmacokinetic Analyses.** *Magn Reson Imaging.*
    - GE T1
    - 20 patients
    - No Variable Flip Angle (VFA) method

- Discussion re: whether the Peled paper sufficiently supports the current Claims
    - Addition of Claim 2a: "At 3T, a measure of $K^{trans}$ of a prostate lesion of 34.3% or larger indicates that a true change has occurred with 95% confidence." (GKM, individual AIF)
    - It was asked whether the authors of both studies provided confidence intervals for repeatability coefficients - with 11 patients, uncertainty is significant
    - Recommendation to examine data and compare methods conducted in the publication vs. methods being used in the DCE-MRI Profile
    - A coefficient of variance to be chosen for the Claim statement; DCE BC members to choose how low or high (i.e., the performance bar)
    - In efforts to avoid being overly optimistic/unrealistic, a conservative number was chosen for the Claim; the number from the publication may be more appropriate
    - Discussion re: whether to have more than one repeatability coefficient
    - Discussion re: robustness of results using Tofts-Kermode model (basic) vs. extended Tofts model

**B1 Mapping for Prostate**
- Discussion on B1-mapping correction continued from previous DCE BC calls
- In advance of the August 5 DCE-MRI BC call, a series of publications discussing DCE-MRI of the prostate, including information of the deviation resulting from the B1 inhomogeneity was circulated
    - Also included were figures illustrating the problem via PowerPoint
    - A significant effect of B1-mapping on measurements in prostate was found
    - The techniques used in the publications are not genuine (meaning MRI-based) B1-mapping for DCE of the prostate, but rather extrapolations from known tissue T1 (either fat or muscle tissue)
    - Usage of genuine B1-mapping in prostate for DCE-MRI has not been published

- o B1-mapping publications by Rangwala and Fenessy used adjacent reference tissue
- o Tier and Stolberg, 1996, showed the need for B1-mapping, but did not scan more than one patient

- Even if the best method for B1-mapping is identified, it may not be able to be used for every scanner
  - o For example, the Bloch-Siegert method was developed by GE, and may not be installed in scanners manufactured by SIEMENS or Philips
  - o The more realistic way is presumably to use the vendor-specific B1-mapping technique

- Discussion whether the DCE-MRI Profile should support B1-mapping, given all the information reviewed by the BC
  - o Caution voiced regarding Claim statement wording if there is not citable literature available to support it
  - o It was recommended that issues be broached in Profile discussion sections, which may be an opportunity to inform the community of needs to be met through further study e.g., obtaining test-retest data
  - o It was noted that publications on only the prostate have been discussed
    - ▪ It is expected that literature on brain will be more common
    - ▪ If necessary, a new literature search will be started

**Checklists (DSC Profile)**
- Dr. Laue followed up with Dr. Ona Wu re: how the DSC BC addressed various Actors in their Profile
- Suggested that "Contrast injector" and "Contrast media" be included as Actors in the DCE-MRI Profile
- Discussion re: the definition of "Actor"; it was agreed that they are devices or materials assigned to roles carrying out specific tasks
- Discussion regarding whether to retain the additional text added to Section 2.1 Clinical Interpretation; it now contains two separate statements with respect to the measured change in $K^{trans}$ of a brain lesion and $K^{trans}$ of a prostate lesion

**Cleaning up Section 3.1 – 3.11**
- More clean-up is still needed

**Next DCE-MRI BC Call:** Monday, August 19, 2019 at 11 AM CT

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