QIBA CT Volumetry Biomarker Committee (BC)
10 October 2022 at 1 PM (CT)
Call Summary

In attendance

			RSNA
Ritu Gill, MD, MPH (Co-Chair)	Mathis Konrad, MSc	Kevin O'Donnell, MASc	Julie Lisiecki
Ehsan Samei, PhD (Co-Chair)	Jayant Narang, MD	Ying Tang, PhD	
Heang-Ping Chan, PhD	Nancy Obuchowski, PhD	Binsheng Zhao, DSc	
Lubomir Hadjiyski, PhD			

Moderator: Dr. Gill

Discussion Topics:

- Potential challenge similar to former QIBA Group 3A challenge
- Planning for Stage 4 Study
- Expansion of the current Profile to include lymph or liver
- Ways to demonstrate better measurements due to use of the QIBA Profile

Decisions/Action items:

Proposed challenge

- A challenge similar to 3A using the RIDER data on a smaller scale is under consideration
  - Dr. Gill evaluated the RIDER data based on reproducibility and determined that different data will be needed to provide ground truth
  - The lack of contrast is also a barrier to use
- Dr. Samei conducted a recent challenge for the liver with simulated lesions
  - Simulated lesions included contrast and ground truth
  - A regular scanner and a photon-counting CT scanner were used in this study

Proposed plans

1) *Plan A – Lung Stage 4*
   a. Try to get the Stage 3 Lung Profile to Stage 4
   b. Clinical setting needed
   c. Challenge is CT scan and re-scan of patients to measure performance
   d. May be able to apply one of Dr. Samei's simulated datasets (see how many cases can be used for lung or liver)
   e. A public cloud-based platform is needed

2) *Plan B – Liver Stage 2*
   a. Expand the Profile to include lymph and liver
   b. May need to go back to Stage 2 (Consensus) to get additional details and create new Profile language
   c. Funding may be needed for this project

3) *Plan C – Lung Volume – Proof of Value*
   a. Demonstrate the value of existing Profile by showing use of groundwork studies
   b. Design a study to demonstrate how measurements are improved by using the QIBA Profile

Discussion comments

- It is OK to have bias so long as it is consistent, e.g., AI tools
  - The real issue is variability or lack of reproducibility

- Primary source of bias is due to different behavioral response of readers to difficult cases with complex lesions
- To reduce variability, the behavioral response must be reduced by creating specific acquisition protocols
- BC leadership and members to reach out to the research community re: data similar to the RIDER coffee break study but with different parts of the body and possibly different measurements

New action items:
- Dr. Samei to follow up via email re: access to shared dataset for proposed challenges
- All to reach out to research community re: similar coffee break studies but for liver or lymph nodes

Ongoing action items: (please strike if complete)
- BC leaders to contact Mr. Buckler, as his company hosted the 3A Challenge data and completed the analysis
- Permission would be requested from participants to use segmentation and volume details of the lesions for publication
- Training and clear instructions needed to provide reproducible results
- Update *re: Dr. Jarecha to look for candidates to provide cross measurements to aid with determining ground truth*: Dr. Narang agreed to support the cross measurements once Dr. Gill has identified the cases and lesion locations.
- Dr. Jarecha to begin drafting some study guidelines for the Stage 4 study
- Dr. Obuchowski to consider an appropriate assessment of the number of radiologists needed for approximately 31 lesions and 14 modules
- Dr. Obuchowski to email the Process Committee working document on study guidelines to Dr. Jarecha (note – this is still in process)
- Dr. Obuchowski to determine if a revised coefficient of variation is needed and share revised sample size plan
- Mr. O'Donnell will double check with Dr. Obuchowski and Mr. Buckler to determine the ideal number of cases needed from RIDER data
- Dr. Obuchowski to adjust section 4.4 to account for precision and bias
- Dr. Obuchowski's revised sample size plan to be shared with Dr. Beaumont (for possible Stage 4 study)
- Suggestion to build use cases for the payers (future Profile version)
- Consider guidance or training data going forward for radiologists to become better "quantitators"
- Other questions to consider:
  - Should the Profile retain repeatability requirements for the radiologist?
  - Should a test of bias and linearity be added?
- Hurdle remains obtaining the test-retest data due to subject exposure to ionizing radiation

Next Call: TBD via doodle poll (approximately one month from now) – mid November-?
(last 2 weeks of Oct, first 2 weeks of Nov., if possible)

Shared Google document / stage 4 planning:
https://docs.google.com/document/d/1Wcmkzp8N_2lLL-FCykNPwgsn1BJOs7Z9A1ZyTIkuGCo/edit
- Group editing is welcome. All are invited to share ideas.

Reference: Data are available on the QIDW – https://qidw.rsna.org/ under CT modality datasets