QIBA CT Volumetry Feasibility TF
30 April 2020 at 11 AM (CT)
Call Summary

In attendance			**RSNA**
Hubert Beaumont, PhD	Rudresh Jarecha, MBBS, DMRE, DNB	Kevin O'Donnell, MASc	Joe Koudelik
Antoine Iannessi, MD	Nancy Obuchowski, PhD	Ehsan Samei, PhD	Julie Lisiecki

Moderator: Mr. O'Donnell

Partnership with Dr. Beaumont:

- Dr. Beaumont is working with the Antoine Lacassagne Cancer Center (CAL)
- Drs. Beaumont, Iannessi, and Hoog have made measurements onsite based on clinical data to better assess an alternative phantom, (CATPHAN 600), as the one required by the CT-ADV Profile (ACR phantom) was not available
- Prescribed measurements were made, following subject handling requirements outlined in the Profile on GE scanners, and the following data were collected:
    - Phantom images with DICOM labels
    - An excel file summarizing acquisition parameters used
    - Radiologist checklist
    - Technologist checklist
- Use of the CATPHAN phantom allowed for scanning and collection of DICOM data to check scanner conformance by providing sample sizes and measurements
- Dr. Samei suggested using free open-source software available from the AAPM for preliminary analysis to determine whether the data are conformant with the QIBA Profile, as measurements of Modulation Transfer Function (MTF) and noise are straightforward
- Analysis software can be downloaded to acquisition sites for use
- The software can be accessed via the following links:
    - TG233 CT image quality program report: https://www.aapm.org/pubs/reports/detail.asp?docid=186
    - Program: http://deckard.mc.duke.edu/~samei/tg233.html
- Following assessment with the software tool, Dr. Samei indicated that he would be happy to review the data if forwarded via email, as there are no formal upload channels in place currently

- Mr. O'Donnell will update the Profile with these software links for reference, or post them to the wiki
    - Consensus was that an automated tool, like the Accumetra tool for the Small Lung Nodule Profile, would be very helpful
- With the participation of three or four additional sites, Drs. Jarecha and Obuchowski think that this activity will help to move the Profile to the Claim Confirmed Stage 4
- Dr. Obuchowski requested the study objectives to calculate the number of patients needed per site
- Mr. O'Donnell intends to create a Google document for the study objectives, study plan, and data needed (phantom and clinical) for sharing with the team
- The decision piece from clinical data is needed to get to the claim confirmed stage

Output wanted:

- The CT VOL BC wants to get sites to confirm that they are conformant with the Profiles and validate imaging protocols, demonstrating that noise resolution and metrics are within QIBA parameters
- Mr. O'Donnell referred to section 4 of the Profile for assessment procedures, focusing on uniformity and noise distribution
- The noise metric is explained further in section 4.2 and contains reference to the MTF 50 value

- Mr. O'Donnell indicated that it would be preferable to receive scores to see how well the process is working and to support QIBA registration or certification for Median Technologies
- The following details would be collected:
    - Which scanners and scanner models were used
    - Description of protocols used
    - Analysis software details (e.g., vendor and version)
    - Number of radiologists involved in making measurements
- The use of different software packages across sites would be acceptable since this would mimic real-world implementation

Quality Check:

- The BC must consider due diligence for a quality check to accept future data
- Discussion re: what "QIBA Registered" would mean for the CT-ADV Profile and what should be included, i.e.:
    - Checklist and scores
    - Phantom scans (for noise and resolution)
    - Patient scans (possible to assess differences between phantom and clinical image ROIs)
    - What is needed for claim confirmed status
    - Test-retest / repeatability data to eliminate issues with variability
        - Because ground truth is not known for a given tumor, repeatability data would be extremely helpful to demonstrate a reduction of variation in the measurement
        - Due to the specific guidelines imposed by the clinical trial sponsor, Dr. Beaumont will not be able to provide repeatability measurements
- Without test-retest data, Claim Confirmed (Stage 4) remains out of reach, but additional data are welcome to support the Technically Confirmed (Stage 3) Profile status

Trial requirements:

- The BC team wants to make certain that they meet all of the eligibility criteria for the trial, e.g. lesion sizes, and whether there is a measurable design
- They will do a quality check on images for image acceptance to move forward
- Dr. Beaumont mentioned that some of the patients were managed by Median, and if they were blinded, no QC is available
- It is possible that repeatability data can be obtained in situations where the first scan is not optimal; repeat scans can be done for confirmation in this situation
    - Dr. Beaumont to review each site's IRB for details re: QC procedures

Action items:

- Mr. O'Donnell to follow up with Dr. Samei regarding SLN Profile feedback to establish a clear link between questions and answers to provide closure for the SLN BC team
- Mr. O'Donnell and Dr. Obuchowski to draft a Google document for the Task Force outlining the study objectives and study design
- Mr. O'Donnell to add the AAPM open-source software links to the Profile or for use on the wiki
- Mr. O'Donnell to link a Google document that lists acceptable phantoms for the Profile for reference
- A call for the BC to be scheduled in 4 - 6 weeks per doodle poll (Dr. Hoye to provide a simulation study update)

Next Steps (ongoing):

- Reviewing binning of lesion sizes (e.g., small, med, large) as a change proposal for the Profile (Dr. Hoye)
- Obtain input from Dr. Obuchowski regarding the work of Dr. Samei's group to determine if a revised coefficient of variation is needed

Next Call: To be determined via doodle poll (in 2-3 weeks).