QIBA Quantitative CT Group 1C Subcommittee Update

Wednesday, December 8, 2010; 2 PM CST

Call Summary

In attendance		**RSNA**
Charles Fenimore, PhD, (Chair)	Nicholas Petrick, PhD	Joe Koudelik
Andrew Buckler, MS	Anthony P. Reeves, PhD	Julie Lisiecki
David A. Clunie, MBBS	Ganesh Saiprasad, PhD	
Philip F. Judy, PhD	Ehsan Samei, PhD	
John Lu, PhD	Ying Tang, PhD	
Michael McNitt-Gray, PhD	Hiro Yoshida, PhD	

Update:

- The imaging protocol is largely set for 4 of the 5 imaging sites / imaging devices. Toshiba is currently working on the protocol.
- In the QIBA Working Session at the RSNA Annual Meeting, the discussion of QIBA v-CT 1C included several suggestions that sharper reconstruction filters be used in order to get better volume estimates.

Imaging protocol:

- A table of imaging parameters for the various scanners is to be distributed with this Summary – see ImagingProtocol-1C-2Branches.doc.
- For the GE 64, the Philips 16, and the Philips 64 the parameters for the 2 protocols differ and we should image under both branches of the protocol. For the Siemens Sensation 64, the two protocols are identical by design.
- While we propose to follow the current imaging protocol, in response to the suggestions of the working session, we will generate additional reconstructions with alternative filters for use in later studies.
- The additional filters might include combinations of sharper filters and iterative reconstruction filters.
- Participants are asked to review the imaging tables for correctness so that we can finish the imaging protocol.

Phantom design:

- We propose to image the FDA anthropomorphic thorax phantom with 8 nodules plus the NIST pocket phantom.
- For physical arrangement of phantom nodules we will rely on Dr Petrick.
    - Tie into place; attach to vasculature
    - It would be helpful to know the orientation of the phantom nodules. Orientation can be determined to within about 5 degrees
- Lesion density: -10 to +100 HU, whichever is clinically relevant. Dr Samei will provide some data on the density of clinical nodules. We will return to this topic on our next call.

Reading:

- The draft reading protocol calls for 5 readers using the same software at a single site, using a single monitor if possible.
- The number of nodule reads per radiologist is about 240 with no repeat reads. (The 5 sites will generate 2 series with 8 nodules, with 3 size measures - volume, span and area.) The most time-consuming measurement will be the volume.
- Reading study complexity will depending on:
    - need for repeat reads. What does 1A tell us about inter- vs. intra-reader variance.
    - number of sizing measures. Can we get by with 1-D and 2-D measurement derived from segmentation?
    - number of readers. Do we have the necessary data to power the study?
    - Acceptability of fractional design (less than full-factorial reading.)
- Reading the imagery in 2 months raises issues of possible memory effect between read sessions.

Next Steps:

- Group to review table and add comments/ data as needed, to be provided by Dr. Fenimore.
- Dr Samei to provide papers on lesion density.
- Each site should check for possible dates for scanning the phantom.
- Rick Avila may have stat on volume variation associated with the parameter variations of this study.
- Would specifically like input from Dr. Kim and Dr. Lu on powering study.

Next call: Proposed for *Wednesday, December 15, 2010.*