

QIBA Volumetric CT Group 1C Update WebEx
Tuesday, January 13, 2009
1:00 pm CST

Call Summary

In attendance:

Charles Fenimore, PhD (Moderator)
Andrew Buckler, MS
Denise Aberle, MD
Robert Ford, MD

Michael McNitt-Gray, PhD

RSNA staff

Susan Anderson
Joe Koudelik

Statement of focus and scope of study (Dr. Fenimore)

- Continued working from matrix to assess sources of variability
 - Protocol measurement process
 - Particular interest to cross platform issues

Overview of the 12.19.2008 Group 1C call (Dr. Fenimore)

- Variation Due to Modality Physics
 - Breakdown between linear beam and other reconstructions
 - Cone beam vs. linear reconstructions require addressing now
- Variation in Scanner Design
 - Image quality metrics - what is needed to support this?
 - Focus around some image quality standards - not tied to specific manufacturer
- Variation in Field of View (FOV)
 - Control for variation in FOV
 - Should be specified, e.g. “reconstruct from rib-to-rib”
- Decision to not consider Contrast Agents and Patient Handling Protocols now
- Group to focus on variation within individual scanners.
- Variation in CT acquisition protocols also needs addressing
- Variation due to acquisition protocols should be undertaken first
- Need to provide appropriate details and definitions in protocol(s)
- Dr. Ford (RadPharm) to provide readers for the phantom studies
 - Will identify linear and 2D volumetric assessments
 - Will provide measurements and extracted segmentations

General Discussion

- Variation in KVP Across Sites
 - KVP to be made a component of this study
 - KVP varies between scanners
 - Variation is possible even at same KVP settings across scanners
 - Even if KVP can be kept constant on CT, variation across scanners is possible
 - This should be addressed in the UPICT group work

- Acquired protocols
 - We're not at the stage to state what the profile needs to be
 - We need to know more about profile parameters to set down details
 - Need to characterize profiles and reach decision on profile details
 - Phantoms are a good place to begin determining profile parameters
 - e.g. KVP, collimation, FOV

- Range of variable parameters is the Group 1C focus
 - Group 1C can determine variability if subset of parameters used
 - Need to know more about profile parameters to set down details
 - Group 1C not at stage to state what profile needs to be yet
 - May come close to defining what is necessary to get accurate volumetrics

- Two questions posed
 - What input factors do we vary?
 - What are our output measures? (i.e. how accurate are actual measurements?)
 - Perhaps some general assessment of quality that involves radiologists (readers) required
 - Visual assessment needed (i.e., readers)
 - Physicists to standardize

- ACRIN 6678 Parameters Table
 - Are all parameters represented in the table? Any more to be added?
 - KVP, mAs, reconstruction algorithm, slice thickness, recon interval, voxel size
 - NLST table appears more detailed

Outstanding Issues for Group 1C

- Translation needed per scanner
 - Not all scanners use the same terminology
- Variation in reconstruction (no control over this)
 - Display FOV is critical parameter to specify
- Image prep (post processing)
 - Low priority now relative to volumetrics

- Need to specify and hold parameters fixed
- Variation in measurement software/algorithms
 - What type of acquisition is needed?
 - Post processing with date
- Variation in operator skill/judgment
 - Does this affect volumetrics?
 - Any way to mitigate this variance?
 - Some variability here (1A and 1B will characterize)
 - What is the variability between operators (i.e. non-readers)?
 - Variability of operators not to be pursued by Group 1C

Next steps

- Use column “D” of the matrix as a guide for Group 1C
- Complete the table (matrix) discussion
- Develop a study design for the next call
- Proposal of validation areas to be drafted by Dr. Fenimore and discussed on the next group call - look at design issues/validation issues
- Dr. Nicholas Petrick to be on next group 1C call
- Joe Koudelik (RSNA) to work with Dr. Fenimore to poll dates for the next 1C call. Feb 3rd might be problematic for government participants.