QIBA vCT Group 1B Update WebEx

July 22, 2009 at 2 PM CDT

Call Summary

In attendance:

Michael McNitt-Gray, PhD (Moderator)
Kristin Borradaile, MS
Charles Fenimore, PhD
Grace Kim, PhD
Michael O'Neal, MD
Nicholas Petrick, PhD
Binsheng Zhao, PhD

RSNA
Susan Anderson, MLS
Joe Koudelik

General Discussion:

- MSK Coffee Break experiment data posted to the NBIA site
- Drs McNitt-Gray has downloaded 32 cases and is performing a detailed inventory at UCLA
    - UCLA medical physics student, experienced with the Anthony Reeves Volcano Study, is currently identifying lesions to use in the vCT 1B studies
    - X,Y,Z coordinates and screen captures will be provided
    - Dr McNitt-Gray to have a radiologist back-up reads to confirm student results
- Dr Zhao to forward the MSK Coffee Break experiment paper, published in July 2009 *Radiology*, and lesion inventory for the MSK Coffee Break experiment to Dr McNitt-Gray as reference

MSK Coffee Break Experiment - Number of Lesions and Case Complexity

- 32 cases/patients with multiple lesions per case possible
- One lesion per patient recommended for a clean study design with clean control factors; multiple lesions per patient may not be considered independent-"adjustment for dependency" would be needed
- 38-47 cases would be ideal statistically (per Dr Kim); 32 cases is acceptable number
- 32 lesions stat-wise recommended (80% stat power with 20% detectable difference)
- Final design decision:
    - 32 cases-one lesion per case
    - 8mm-20mm lesion sizes
    - 5 readers (6 readers of no statistical benefit)
    - 2 time points
    - 3 measuring techniques (Uni-Dimensional, Bi-Dimensional, volume)

Logistical Discussion

- Suggested was that Group 1B use the vCT Group 1A case randomization process as a guide
- Dr Petrick to forward the Group 1A randomization code to Dr McNitt-Gray
- Randomization based on 32 cases
- Scan 1, scan 2, etc all read at different sessions

- Randomization process differs per reader to avoid seeing the same case at end of reading sessions
- Measurement techniques randomized as well
- Ms Borradiale to send RadPharm naming conventions to Dr McNitt-Gray
- Six copies sets of each reader dataset needed to provide fresh images for each measuring technique
    - RadPharm to set-up 36 copies of 1B data

Reader Fatigue

- Readers on the Group 1A project may encounter the same case three times in one day; three different measurements being performed though
- Learning affects on readers to be taken into consideration
- Readers may acquire knowledge concerning lesions details resulting in some "measurement trend"
- Bias may result in uni-, bi- and volume measurements
- Worthwhile to ask readers if they recollect the previous read or viewed structure
- Audit of segmented structure, e.g. did reader log Y/N if the automated segmentation was edited on a case-by-case basis deemed useful
    - Only for volumes and *semi-automated* LD and PD measurements
    - Indicator of reader comfort with software function
        - Could introduce bias or greater variability though
- Reader satisfaction (1) per lesion or (2) at conclusion of reader session – deferred until later date

Next Steps:

- Dr Zhao will talk with Dr Clarke about MSK Coffee Break inventory; will request that inventory be posted on NBIA site
- Setting-up of reader order for Group 1B will be the next step
- Drs McNitt-Gray and Kim to draft a 1B randomization scheme for group presentation
- Dr Petrick to send the 1A protocol to Drs Fenimore, Kim, McNitt-Gray and Ms Borradaile
- RSNA staff to distribute the 1A protocol to the 1B group
- Ms Borradaile to send the RadPharm randomization and naming convention documents to Drs Fenimore, Kim and McNitt-Gray
- Dr Fenimore to design reader satisfaction question, to serve as a to a "hot-wash" following a reading session
- Next Group 1B call to be scheduled