QIBA VolCT Group 1B Update WebEx
Wednesday, Feb. 25, 2009
11 AM (CST)

Call Summary

In attendance:

Michael McNitt-Gray, PhD	**RSNA**
Andrew Buckler, MS	Susan Anderson
Charles Fenimore, PhD	Joe Koudelik

General Discussion

Scheduling of VolCT Group 1B and 1C calls

- Group calls will adhere to the current schedule (Wednesdays at 11 AM CST); rescheduling to accommodate more participants will be reconsidered after 1-2 cycles perhaps alternating Tuesday/Wednesday schedules
- Ad hoc calls may be scheduled in the mean time if needed

Overview of Question 3: What is the minimum detectable level of change that can be achieved when measuring tumors in patient datasets under a "No Change" condition?

- Aims for this study - Measurement of change in volume
- Estimate variance between readers
- Expected value of change should be close to zero
- Which metric is needed to measure change?
- Inter and intra-observer variability to be examined
- Variance or RECIST measurements not known
- Holding volume to 18% variability is worth investigating
- Measured variability of RECIST metrics not known
- Inter- and intra-observer data to assess is both volumetric and RECIST and may bring statistical rigor to these measurements
- Larger size change (for RECIST) is indicative of variability
- Need a statistical context with evaluation data to back-up this claim
- Volumetrics being held to a higher standard than RECIST
- Dr. McNitt-Gray to consult with Grace Kim at UCLA for stat support
- Dr. Fenimore to consult with Dr. John Lu at NIST for stat support
- Dr. Lu and Ms. Kim to provide stat advice for next Group 1B call

Change metric

- Absolute value of change in diameter and volume measurements should be possible
    - Capture of MASK data is needed
    - Used to compute diameter work

    - Four different size metrics based on boundary measurements done by Dr. Tony Reeves (The Lung Image Database Consortium (LIDC): a comparison of different size metrics for pulmonary nodule measurements. Reeves AP, Biancardi AM, Apanasovich TV, Meyer CR, MacMahon H, van Beek EJ, Kazerooni EA, Yankelevitz D, McNitt-Gray MF, McLennan G, Armato SG 3rd, Henschke CI, Aberle DR, Croft BY, Clarke LP. Acad Radiol. 2007 Dec; 14(12):1475-85)
- A single useful metric to assess the quality of images is not without risk
    - Real settings not known when comparing scanner systems - difficult comparison
    - Not clear how to use in a systematic way
- Categorical variable needed?
- Main point of study is to come up with a statistical criteria to identify change
- NCIA query of 1 or more of Dr. Reeves' metrics to be posted on QIBA Wiki
    - Dr. McNitt-Gray to forward Dr. Reeves' link to Joe to distribute to 1B and 1C members

LIDC data overview

- Four contours expressed as boundaries
- Volume and diameters could be calculated from the contours; LIDC did not measure diameter directly
- Metric could be derived from these contours (50%, 0% or 100% (most exclusive)
- Dr. Reeves has data from all or some LIDC nodules and is willing to share data
- A size metric needs to be agreed upon (derived from LIDC data contours)

Intra-observer component

- Same reader to repeat cases
- Dr. Fenimore to inquire with Dr. John Lu (NIST) about case numbers needed per reader
- Need to identify end readers
- Individual reader info should be retained in datasets
- Can associate a characteristic "uncertainty" for each reader
- RIDER study used 2 readers, LIDC study used 4 readers
- RadPharm to add additional mark-up to LIDC images
- Diameters to be marked directly - not just boundaries
- LIDC markings to go with datasets (Question 1)

Existing Resources

- RIDER - MSK Coffee Break Data (no-change condition)
- 32 NSCLC patients
- Imaged twice on the same scanner within 15 minutes
- Thin slice (1.25mm) images
- Manual linear measurements performed by 3 readers; volume obtained from algorithm
- Number of lesions needed from Drs. Schwartz or Zhao (MSK)
    - May need to identify smaller lesions to study
- Reader Tasks
        - Readers to mark each lesion with L and P diameters
            - Semi-automated contours provided
- Capture MASK data

- Must randomize case order to avoid same reader reviewing multiple sets of patient scans
- Drs. Lu and Schwartz will discuss randomization process and comment

Timeline for Group 1B

- Will follow Group 1A and utilize same readers (RadPharm)
- No MSK Coffee Break or RIDER data in hand yet
- Dr. McNitt-Gray to inquire with Drs. Schwartz or Zhao about posted MSK data
- 3-4 more Group 1B calls before project commences
- Constant movement from 1A to 1B to 1C needed to maintain project flow and build momentum
- Strive to have initial data by May '09 QIBA meeting date
- Group 1B/1C calls to be scheduled for the group which requires the time depending on project status/phase

Next Steps

- Dr. John Lu, PhD, to be added to VolCT Group 1B email distribution list as stat support
- Dr. McNitt-Gray to forward Dr. Reeves' link to Joe to distribute to 1B and 1C members
- Dr. McNitt-Gray to inquire with Dr. Zhao about posted MSK data
- Additional dataset details and experimental protocols for statistical analysis next step (i.e. sample size calculations)