Call Summary

In attendance:
Andrew Buckler, MS (Co-Chair)                               Kevin O'Donnell
P. David Mozley, MD (Co-Chair)                               Nicholas Petrick, PhD
Lawrence Schwartz, MD (Co-Chair)                            Ekta Shah, MS
Charles Fenimore, PhD                                      Lisa Anderson
David Gustafson, PhD                                       Joe Koudelik
Frank Klein                                                RSNA staff
Michael McNitt-Gray, PhD                                    Fiona Miller
James Mulshine, MD                                          Susan Anderson
Daniel R. Nicholson                                        Joe Koudelik

Agenda (Mr. Buckler)

- Group reports
- Workflow
  - Groups 1A and 1B to influence Profile Details
  - Group 1C to set Profile Claims - based on profile details

Group 1A (Dr. Petrick)

- Wiki is updated with examples of filters and output data formats
  - Request consensus from the group on filter and format to use in pilot and study
  - Suggestion:
    - For Reader study: use tools generally available in house (short term - eventually utilizing DICOM format)
    - For Profile: use one of three DICOM formats
      - 1. Used by chest CAD systems
      - 2. Voxel-based
      - 3. Surface measurement
    - Benefit is availability of management tools and that PACS can be used to manage data
    - Can adjust to other formats once system is in place
  - Important to use formats compatible with real-use model (DICOM format)
  - RadPharm will use Siemens format for Group 1A pilot study
  - Material will be uploaded to Wiki to facilitate short discussion on DICOM format advantages (Mr. O'Donnell)

- By end of week, Wiki will be updated with the steps of the reader study
  - Request consensus from the group; when steps are finalized, pilot can begin

- The 10 initial cases for the pilot have been shipped to RadPharm
- Issue of data storage format
  - More general PLY format vs. 3-D Doctor
Group 1B (Dr. McNitt-Gray)
- Working on Questions 1&3 of 5 initially identified
  - 1: What level of accuracy and precision can be achieved in measuring tumor volumes in patient datasets?
  - 3. What is the minimum detectable level of change that can be achieved when measuring tumors in patient data sets under a “No Change” condition? (extension of the MSKCC Coffee Break experiments)
- Dr. Ford will identify RadPharm readers
- Agreement on data analysis needed
- Dr. Fenimore will offer comments based on his experience
- Drs. Schwartz and Zhao will assist with Question 3 (Coffee Break experiment extension)
- Timeline needed
  - Dependent on Dr Ford’s reader availability
  - Prepared to begin after 1A
- MASK (i.e. segmentation) data to capture coordinates as Group 1A is planning
  - More discussion required
- Which parameters should be used to improve volume measurements: one set of parameters, mimicked on other scanners?

Group 1C
- Agreement will be reached on the platforms and centers to be selected and settings under which imagery is to be collected.

Goal 1
Measure nodule volume on CT imagery collected from several CT scanners/sites (including single scanners with varying settings). Determine the systems to be used and the system settings to be varied.

(a) kVp constant. – follow up w med. phys.
(b) mAs constant. - follow up w med. phys.
(c) collimation fixed (+)
(d) field of view (rib-to-rib == closest possible view)
(e) reconstruction filters – follow-up with radiologists (Dr. Hayes) to find “equivalent” filters

Site selection – poll the team. Scanners follow sites.
- Field of View (FOV)
  - Not a core part of study but a side line - not known whether FOV is a contributor to variance
  - Scale for translation into clinical practice; workflow may be too difficult
  - Is FOV always bilateral?
    - May want larger FOV than “rib-to-rib” for metastases to scapula, etc.
    - Technologists’ terminology may provide better wording, e.g. “skin-to-skin”
  - Working with phantoms, is it possible to do both larger and smaller FOV?
  - Reserve this issue for smallest detectable change, e.g. if using narrow FOV, use two different lesions in two different locations
  - Trial sites for Merck routinely use a 55cm FOV
  - Within a range, variance will be very low
• Could move targeted reconstruction; Dr. Petrick has data from three different scanners  
• FDA data will not be useful; all acquisition is new  
• Shuttling the phantom between sites will show operating conditions across sites  
• NLST experiments tried to make scanners look similar but experiment was hurried  
  o Can this experiment be used to explore more?  
• Recommended article: need citation: Doss, *Neuroradiology* 2007

**Goal 2**  
**Compare the accuracy and precision of measurements for these phantom datasets.**  
(a) RECIST vs. volume change  
(b) Investigate variance & bias  
(c) inter-system variation  
(d) intra-system variation

**Goal 3**  
**Skipped for this discussion**

**Goal 4**  
**Determine the minimum detectable level of change that can be achieved when measuring nodules in phantom datasets?**  
• If we want to directly measure level of change: bias errors associated with volume measurements may be larger than change data (lower level of variations)  
• Try simple solution? Populate the FDA lung phantom with nodules of graded size so there is small change present for reading of nodules of similar but not identical size  
  o Focus on nodules < 3mm  
  o Possible to tie nodules into phantom with surgical suture line - difficult process  
  o A variety of nodule sizes would be useful in estimating a high confidence of volume change

**Next Steps**  
• Material will be uploaded to Wiki to facilitate short discussion on DICOM format (Mr. O’Donnell)  
• Agenda for Feb. 23 call: updates to Profile on Wiki  
  o 1. Claims: pulling information from imaging manuals  
  o 2. Details: request that hardware and software vendors weigh in  
• Ad hoc group of Dr. Mozley, Dr. Hayes, Mr. Avila, Dr. Mulshine, Ms. Shah, Mr. Licato, Dr. Gustafson, Dr. Hilaire, Mr. O’Donnell will spearhead preparation for the discussion  
• Next call: February 23, 2009, 11am CST (No call on Monday, Feb. 16, Presidents’ Day)