QIBA VOL-CT Group 1B Update WebEx
Clinical Image Reference Datasets Subcommittee
January 6, 2009, 1 PM CDT
Call Overview

In attendance:

Michael McNitt-Gray, PhD (Moderator)
Robert Ford, MD
Daniel Sullivan, MD
Binsheng Zhao, PhD
Susan Anderson (RSNA)
Joe Koudelik (RSNA)

General Discussion of VolCT Group 1B Priorities and Resources

- Dr McNitt-Gray identified and posed 5 questions to Group 1B for consideration:
  1. What level of accuracy and precision can be achieved in measuring tumor volumes in patient datasets?
     - Examine bias and variance
     - Examine inter and intra reader variability
  2. What level of reproducibility in estimating change can be achieved when measuring tumors in phantom datasets?
     - Determine change metric to study
     - Need a variety of lesions of know sizes
     - May leverage Group 1A data to simulate lesion size change over time
  3. What is the minimum detectable level of change that can be achieved when measuring tumors in patient datasets under a "No Change" condition?
     - Coffee break extension experiment
     - Lesions with no know true size of change
     - Additional readers may be needed
  4. What level of reproducibility in estimating change can be achieved in measuring tumors in patient datasets with "Unknown Change" condition?
     - Similar to RIDER datasets
     - No true size known
     - Include some patient data with lesions from various time points
  5. What is the effect of slice thickness on estimating change in tumors using patient datasets?

- Questions (1) and (3) were determined pursuable at this time, with the following criteria:
  - Limit work to thorax and lymph node areas
    - Intraparenchymal lung lesions included
    - Eventually extend to liver lesions
  - Linear uni/bi-dimensional and volumetric measurements suggested
  - Statistician needed to help determine number of required readers for scope of proposed projects
    - Grace Kim (UCLA Statistician) suggested by Dr. McNitt-Gray for assistance
  - Projects must not overburden RadPharm readers, already slated to assist Group 1A
  - Dr. McNitt-Gray to identify datasets with this criteria

- MSK Coffee Break Experiment - Overview by Dr. Binsheng Zhao
  - Three readers provided markup - uni and bi-dimensional regions
    - Only one reader performed volumetric work
  - MSK specified the semi-automated algorithm to use
  - Readers allowed to "edit" the results/output

- RadPharm Software - Overview by Dr. Robert Ford
    - OncoCare PACS software used (Siemens)
    - Linear, bi-dimensional and volumetric measurements possible
    - RadPharm to codify images by anatomical site. This labeling will assist future projects with identifying appropriate datasets
    - Applying a semi-automated algorithm and comparing to the LIDC truth (vol/lin/bi-dimensional) was suggested
- LIDC annotated datasets ready for Question/Project #1
    - Contours provided for readers
    - Need a single size metric and diameters
    - Need to identify LIDC lesions and have readers contour
    - 3mm-30mm lesions only (contoured only)

Next Steps:

- Flesh out experimental design and identify resources for questions (1) and (3)
    - Measurement tools needed
    - Software tools needed
    - Number of readers
    - Analysis assistance required
- Present to whole group after Group 1B members have time to comment
- Have dates in-hand now
- May be difficult to obtain wide enough range of LIDC cases
- Dr. Tony Reeves may have some useful datasets
- Definitions needed for clarification
    - Bias
    - Accuracy
    - Variance
    - etc.
    - Dr. Fenimore's Group 1C also working on definitions

Action Items:

Dr. McNitt-Gray to contact Dr. Reeves concerning additional datasets