QIBA vCT Technical Committee Weekly Update
Monday, August 31, 2009
11 am CDT

Call Summary

In attendance

Andrew Buckler (Co-Chair)
P. David Mozley, MD (Co-Chair)
Maria Athelogou, MD
Kristin Borradaille, MS
David A. Clunie, MBBS
Patricia E. Cole, PhD, MD
Charles Fenimore, PhD
David Gustafson, PhD
Philip F. Judy, PhD
John Lu, PhD
Michael McNitt-Gray, PhD
James Mulshine, MD
Nicholas Petrick, PhD
Yuanxin Rong, MD, MPH
Daniel Sullivan, MD
Hiro Yoshida, PhD
Binsheng Zhao, DSc

RSNA staff

Fiona Miller
Susan Anderson, MLS
Joe Koudelik

Agenda (Mr Buckler)

- Comments on Group 1C activities discussed last week
- Update on Group 1A and 1B
- Profile and groundwork for early lung cancer
- Roadmap re: additional activities toward ultimate goal of qualification of vCT

Group 1A update (Dr Petrick)

- Scanning is complete for Group 1A
- Discussion with Drs Grace Kim and Marios Gavrielides to formulate analysis plan
    - Need logical plan to limit the number of covariates included in analysis to maintain healthy statistical significance; Decision to look at each individual covariate and determine whether it should be included
- Discussion on how to compare volumetrics, area and diameter, how to handle orientation issues
- Did not preserve orientation of object with acquisition; could possibly re-figure;
- Micro-CT may help with orientation of lesions within phantom but different thresholds make it difficult to correlate w/volume.
- Normalized error for each metric to be used as one comparison
    - Will look at normalized air (unitless measures) to compare to each other
- Defining truth (not easy even in phantom):
    - Relative truth on measured volume of sphere of that size and convert back to diameter
    - Use actual measures of actual lesions e.g. longest dimension
- Another issue is assessing algorithm performance, comparable to activities of suppliers
- Group will use one method but acknowledge there are other methods
- Dr Petrick will finalize the plan, write a protocol of the analysis plan and circulate to Group 1A by end of September

Group 1B update (Dr McNitt-Gray)

- Recent call Aug 26, 2009
- Have identified image data (MSKCC and UCLA lesions) and have passed cases to Kevin O'Donnell
- UCLA nominated two new lesions based on homogeneity to supplement MSKCC cases
- Dr Kim has formulated randomization scheme; Dr Clunie has supplied description of software
    - Will determine reader schedules and project deadlines with RadPharm; no timeline in place yet
- Interest in broadening participation and thereby increasing significance by including other CROs
    - Optimal if design is transportable: cases, reader sessions, etc.
    - Methodology is transportable but RadPharm is using its own tools (not transportable)
    - NCI algorithm could make this more transportable but AVT validation tool kit effort is stalled; in future, AVT may facilitate transportability
        - Suggest that AVT use QIBA data to help algorithm development

Group 1C update (Dr Fenimore)

- Call scheduled for Sept 2, 2009; will discuss mark-up with RadPharm and planning image acquisition/data collection between manufacturers and between sites
    - Discussion of feasibility of expanding collection of imagery
        - Mark up for larger number would be difficult and could therefore compromise the analysis.
        - Should it be limited to accommodate markup/limit readers?
    - Should we aim to limit tools used for mark-up?
- Inter and intra-reader variability seen in Group 1A may influence the design of 1C study at reading stage, e.g. repeat reads
    - 1 A analysis should be available by 9/30; may not see variation because task is constrained
    - Clinical judgment can impact outcome, even though constrained
- Suggested that algorithm performance is a higher priority than differences in reader culture
- Would like to include possibility of determining lesion orientation in phantom (near future)
- May have great impact if study can characterize 1-D and 3-D volumetrics
- Examine:
    - Sites and measurement tools may be additional covariates
    - Site reading process/reading culture (less pressing)
- Important to be careful of Claims made based on limited smaller experiments

Roadmap discussion

Goal:

i. BioPharma industry to evaluate vCT similar to RECIST
ii. Suppliers of equipment and software to know what is required to provide "basic" performance

- The Roadmap is a series of steps towards i and ii above
- Harmonized QIBA process available as section D.3.1, the work plan of the QIBA Projects, in NIBIB proposal
    - Section 2: technical characteristics and standard groundwork: Groups 1A-B-C working in this area
    - Section 3: Profile development
    - Section 4: Have not dealt with this area in vCT; DCE-MRI synthetic data work is in this area

    - Section 5. Clinical performance groundwork
- Aim is to work in parallel tracks with participation by all
- Original Roadmap deemed overly complex
- Plan could be abbreviated skipping some steps and adding missing detail in other steps, e.g. acknowledge that MSKCC has delivered the coffee break data
- Results should go on Wiki but also on more publicly accessible QIBA website

Next steps

- Continued discussion on Roadmap; Dr Mozley to suggest areas where detail is needed
- Dr Petrick will finalize the plan, write a protocol of the analysis plan and circulate to Group 1A by end of September
- Staff to include entire group in notifications of Group 1C subcommittee calls