

QIBA Quantitative CT Committee Update

Monday, June 14, 2010

11 AM CDT

Call Summary

In attendance

Andrew Buckler, MS (co-chair)
P. David Mozley, MD (co-chair)
Maria Athellogou, MD
David A. Clunie, MBBS
Charles Fenimore, PhD
David Gustafson, PhD
Grace Kim, PhD
Michael McNitt-Gray, PhD
Daniel Nicolson

Nicholas Petrick, PhD
Anthony P. Reeves, PhD
Genesh Saiprasad, PhD
Daniel C. Sullivan, MD

RSNA

Fiona Miller
Joe Koudelik

General discussion

- Dr Athellogou discussed the Definiens perspective on the need for a reference volume phantom to establish standards based on “typical” measurement methods
- A reference dataset also needed to be used in various ways, e.g. algorithm testing, etc
- Proposed was to utilize current QIBA phantom acquired datasets from Q-CT Group 1A and rerun additional analysis based on multiple algorithms (single algorithm used so far)
- An approved set of statistical calculation methods to compare with Ground Truth needed
- Creation of a master data file to check biomarker performance for qualification and establish compliance mechanism

Reference volume phantom

- Pharma point made regarding wide variability in volume estimates seen from a multi-center image-analysis review
- A single reference standard phantom would be essential criteria to assess to help reduce “reader judgment” and help with multi-algorithm analysis
- Phantoms needed that provide lower density contrast (for future liver studies, etc)

Reference datasets

- Strong reference/performance datasets needed; Dr Mozley offered to contribute data from ten independent Merck analysis teams
- NBIA suggested as possible host of datasets flagged as “QIBA CT Collection”
- Push to characterize clinical cases; test-sets needed; what level of CRO vs. supplier activity needed?
- Increase collection of clinical datasets; analysis to address broader issues of target lesion selection and different contrast levels, e.g. volume analysis in multiple organs
- Characterize performance beyond Group 1A work; characterization of multiple algorithms possible
- Obtaining “clean” clinical cases will remain a challenge; Drs Clunie, Mozley and Reeves might select dataset(s) to characterize performance

Change analysis

- Need to define change analysis; direct measurement of change to be pursued
- Suitable lesion selection criteria needed; Dr Mozley to define activities – “how people could help”
- Perhaps a suitable set of lesions will be available from Biochange work
- Volcano study provided a consensus of change to develop a benchmark set of cases based on best-thinking of the time
- Challenges remain due to the variation encountered in real-world cases

- Warning not to simply repeat the MICCAI Challenge; Dr Clunie to forward literature search details
- Dr Gustofson to discuss tasks associated with the MICCAI Challenge

Outcomes study

- Supportive outcomes data needed; define activities concerning outcomes

Next Steps

- Building strong reference/performance datasets needed; Drs Clunie, Mozley and Reeves might select dataset(s) to characterize performance
- Dr Mozley to define activities – “how people could help”
- Dr Gustofson to discuss tasks associated with the MICCAI Challenge
- Dr Clunie to forward literature search details on MICCAI Challenge

MICCAI Challenge

<http://grand-challenge2009.bigr.nl/>

<http://grand-challenge2008.bigr.nl/>

<http://mbi.dkfz-heidelberg.de/grand-challenge2007/>

Volcano challenge

<http://www.via.cornell.edu/challenge/>