QIBA VOL-CT Part 1B - Clinical Image Reference Datasets Subcommittee WebEx
October 15, 2008, 11:30am CDT
Call Overview

In attendance:

Michael McNitt-Gray, PhD (Chair)
Charles Fenimore, PhD
Robert Ford, MD
Lawrence Schwartz, MD
Binsheng Zhao, PhD
Fiona Miller (RSNA)
Joe Koudelik (RSNA)

Being the first scheduled group call, Dr. McNitt-Gray welcomed and thanked all for participating. The group then began discussing what the overall goals and scope of the "Part 1B Clinical Image Reference Datasets" Technical Subcommittee should be.

General Discussion
The group discussed its given charge to develop referenced data sets for patient images.

- Group needs to determine questions to be answered with these datasets

Group 1B needs to look at volume change

- Pharma needs volumetric change to be characterized via algorithm performance
- Change in volume analysis is needed
- Is a new metric to be developed?
- Primary focus should be on change, secondary on volumetrics
- Looking for fractional changes in volume to compare with RECIST linear measurements

Dr. Fenimore provided details concerning the NCI RIDER project datasets made available by NIST

- 7-8 patient datasets that are a subset of the RIDER dataset of 23 cases that had RECIST (single linear dimension) markup performed by radiologists
- Majority of data is thick slice (i.e., 5mm)
- Data is expected to be available

Slice thickness issues discussed

- 5mm slice too big to study lesions less than 10 mm in size
- Is there a limit to slice thickness where volume change accuracy drops off?
- Linear RECIST measurements on thin sections may be more accurate than volumetric change measurements on thick sections (i.e., if poorly done, volumetric change measures are less accurate than linear RECIST measures)
- Studying algorithm performance with various slice thicknesses proposed
- Study should include both phantom and patient images
- Patient images will provide more challenging experiments, thus more convincing
- Single dataset preferred over serial CT images, for now

Progression & Response-to-Therapy Simulation (Phantom study with Water Balloons)

- CT scan water balloons suspended in an oil bath
- By increasing balloon size, lesion progression can be simulated
- By decreasing balloon size, lesion therapy response can be simulated
- Exact volume of balloons known and can be compared to volume change measurements for accuracy

Lesion Size

- Lesions less than 10mm are difficult to measure with accuracy
- "To small to measure lesion" stated in Dr. John Boone's previous article for 5mm and smaller lesion sizes
- RECIST base-line is 10mm lesions
- Small lesions needed to test algorithm "break-down" performance and measurement studies should be pursued
- More discussion needed with Dr. Petrick and Group 1A concerning small (<10mm) lesion sizes

Next Steps:

- Map out action items dealing with phantom group

Action Items:

- Dr. Zhao to send *Radiology* publication concerning measurement accuracy based on slice thickness to group members for reference (what slice thickness is needed for volumetric measurements)
- Dr. Ford to inventory RadPharm for thin slice data
- Dr. McNitt-Gray to send Dr. Ford criteria he uses to identify "appropriate" thin slice data