

QIBA COPD/Asthma Committee Update

Wednesday, August 18, 2010

2 PM CDT

Call Summary

In attendance	Joshua Levy
Philip F. Judy, PhD (co-chair)	John D. Newell, Jr, MD
Andrew Buckler, MS	Susan A. Wood, PhD
Heather Chen-Mayer, PhD	
Harvey O. Coxson, PhD	RSNA
James D. Crapo, MD	Joe Koudelik
Zachary H. Levine, PhD	Julie Lisiecki

NIST Foam Scanning Update (Drs Levine and Chen-Mayer)

- Full spectrum x-ray intensity measured in-house (NIST) using m80 beam at 50 micron resolution
- Two foam stacks of four densities scanned along with a water column (water thickness measured)
- Beam-hardening effects observed with foams and water (more prominent with water)
- Drs Levine and Chen-Mayer to visit Argonne National Lab mid-August to run spectral resolution measurements and to examine more than one kVp value
- Goal is to eventually issue foam as a “NIST standard reference material” claiming specific CT numbers
- More details modeling system needed
- Quantitative CT to measure bone density also of interest, e.g. ICRU simulated bone material to be scanned and analyzed like foams

Modified COPDGene Phantom Insert (Dr Judy)

- Beam hardening and scatter remain two major issues
- New insert design discussed to contain water, acrylic, air hole insert, and multiple tubes to better evaluate airways; minimum modifications of COPDGene phantom needed
- Trachea air CT anomalies are local phenomena associated with elastic beam scattering, experiments are ongoing at Iowa on a modification of the COPDGene phantom to model the change in the air trachea CT number.
- Insert (air, water, acrylic) in one phantom may help industry develop algorithms and cross-compare scanning platforms,
- Susan Wood suggested COPDGene phantom requires smaller tubes to mimic smaller airways.
- COPDGene phantom modification are to be “usable and widely accepted”
- SPIROMICS is next large-scale study to test modified phantom insert (10,000 scans)
- Many international studies in progress; study/use of phantom needs to be internationalized
- Dr Judy to follow-up with Mr Levy concerning modified insert price quote based on newest design

Progress made on COPD Profile

- Dr Lynch working on Profile framework
- Drs Newell and Coxson to provide content
- Progress expected in two weeks time to discuss on Sept 1 (2 PM CDT) call
- Profile document to contain compliance procedures
 - Articulate performance Claim
 - Describe how to achieve performance
 - Describe how to certify compliance
- Profile utility needed to address other organ systems beyond lung, e.g. heart, brain, bone, etc
- CT, PET, MRI committees already expanding Profile beyond initial single scope
- A single phantom may not be possible to address unique problems of various organ systems; too many modification within single phantom may introduce artifacts, thus defeating main goal
- Consensus of call participants was to continue focusing on lung for current iteration of phantom insert
- Possible ACR approach needed
- Dr Judy to follow-up with QRM Company (Germany) concerning possible multi-featured phantom already being produced; Dr Judy to forward company website URL to Dr Crapo for reference

- Profile – addresses Claims for performance characteristics aimed at specific readouts and ability to make compliance oriented measurements
- Protocol developed based on experimental groundwork converging on Profile performance Claim
- Claims may state performance characteristics that are not yet in reach, i.e., Claims may be long-range technical goals
- Iterative process of reviewing groundwork and modifying protocol in parallel

Next steps:

- Dr Judy to follow-up with Mr Levy concerning modified insert quote based on newest design
- Dr Judy to forward QRM company website URL to Dr Crapo for reference
- Profile progress will be next call topic
 - Dr Lynch working on Profile framework
 - Drs Newell and Coxson to provide content
- Juerg Tschirren to join next call
- Next call scheduled for Sep 1st at 2 PM CDT

Modified COPD Gene Phantom Insert containing NIST Foams (Dr Judy)

Delete holes in lung foam

