

QIBA COPD/Asthma Committee Update

Wednesday, June 30, 2010

2:00 PM CDT

Call Summary

In attendance

Philip Judy, PhD (co-chair)
David S. Gierada, MD
Zachary H. Levine, PhD
John D. Newell, Jr, MD
Daniel C. Sullivan, MD

RSNA staff

Joe Koudelik
Madeleine McCoy

Foam Measurements for Incorporation in Phantom and NIST Calibration (Dr Levine)

- Foam densities for COPD Phantom use
 - Multiple foam density and standard deviation to be specified as controls to help calibrate CT scanners
 - Standard deviation to be a simple measurement/surrogate of how recon kernel is functioning
 - CT standard deviation also needed as a function of phantom location within scanner gantry
- Stability of Numbers/Attenuation through Water
 - Determine how tube potential varies based on foam densities within a phantom, i.e. stability of CT numbers of varying foam densities
 - If stable, would help calibration for lung scanning
 - Dr Judy to acquire more needed resources to pursue these multiple foam scans
 - Dr Judy to follow-up with Dr Lynch
 - Dr Levine to review the issue of a foam standard-material discussion
 - Need a traceable standard: Hounsfield Units (HU) based on water density, therefore need to relate equivalent absorption through water and convert back to HU which are compatible with the SI System
 - Match attenuation to column of water thickness (attenuation through material)
 - Beam Attenuation Testing by Dr Siegel and Dr Gierada
 - Usefulness of having two to five different foam densities available for the lung profiles; determine whether phantom fill material causes attenuation issues
 - Look at relationship between density measurements to reconstructive algorithms

Finalize Phantom Design (Dr Judy / Mr Levy)

- Acrylic rods embedded within COPDGene Phantom suggested as controls
 - CT number and standard deviation to specify the technique
 - Elastafoam densities do fall within lung mean densities (-385 to -953 HU), but larger natural standard deviation in human lung remains difficult to mimic; manufactures to possibly produce foam densities with broader range of standard deviation
 - Uniformity of fill material and plastic nodule inserts across phantoms discussed
 - Grinding/mixing of foam samples worth pursuing in attempts to mimic lung better
- COPD Phantom
 - Embed rods of uniform material within COPDGene phantom fill foam
 - Funding needed to build the phantom - possible discussion topic to the Steering Committee at the August 27th f2f meeting in Chicago
- Dr Judy to send Dr Gierada his Kyoto Kagaku Lung Phantom analysis for review
- Dr Coxson's COPD phantom proposal
 - Use various density foams
 - Vendors to tune their recon kernels to meet specified CT numbers and standard deviations, leading to a decreased variance between scanners

UPICT Protocol Discussion

- Develop a plan to begin a UPICT protocol; COPDGene study protocol can be adapted into the UPICT template
 - More protocols can be established besides cancer studies
 - Images collected can be adopted for a protocol
 - Start discussions within the group
 - Small working group to bring in COPD experts to develop a more generalized protocol (may extend beyond COPDGene expertise); QIBA members may be a good source of information
 - Eclipse protocol - Dr Harvey Coxson
 - Spironics protocol – Dr Eric Hoffman
 - LTRC data collection protocol
- COPD/Asthma protocol requires more member engagement
 - Frequency of future COPD/Asthma calls to be examined; monthly schedule for the summer months
- FDG-PET consensus meeting in conjunction with SNM deemed worthwhile; good attendance and progress made with PET protocol
- Standards for Manufacturers
 - Roadshow (corporate visits) tentatively scheduled for fall 2010 to present QIBA activities; COPD/Asthma Committee to identify issues needing vendor action
 - Committee members invited to submit a list of three to four topics

Next steps:

- Dr Levine to review the issue foam standard-material
- Dr Judy to send Dr Gierada his Kyoto Kagaku Lung Phantom analysis for reference
- Dr Judy to acquire more needed resources to pursue multiple foam scans; would COPD provide support – Dr Judy to follow-up with Dr Lynch
- COPD Group to provide a list of three to four topics for Roadshow
- Dr Judy and RSNA staff to follow-up with Drs Newell/Lynch/Coxson for inquiry of progress on the profile-updates or drafts
- Funding needed to build the phantom - possible discussion topic to the Steering Committee at the August 27th f2f meeting in Chicago
- Calls to move to a monthly schedule for summer months:
 - Next call Wednesday, August 4, 2010 at 2 pm CDT