

QIBA COPD/Asthma Committee Update

Tuesday, April 13, 2010

11:00 am CT

Call Summary

In attendance

Philip Judy, PhD (co-chair)
Harvey Coxson, PhD
David Gierada, MD
Zachary H. Levine, PhD

Jered Sieren

RSNA staff

Joe Koudelik

Status of phantom working group efforts

- COPD Gene modified phantom being scanned extensively at U Iowa by Dr Hoffman
 - Phantom scanned on multiple Siemens systems
 - Annulus with modified air hole raises the CT numbers more than seen with the Catphan phantom
- Wide variation in air hole CT numbers patient-to-patient difficult to explain; correlation to patient weight is 0.5
- Are CT numbers dependent on air hole size?
- 25mm is standard trachea diameter; range of phantom annulus air holes to be examined
- Mr Sieren (U Iowa) received acrylic rings from Toshiba for re-scanning at U Iowa; will manipulate material within phantom to determine if CT numbers vary with position changes (beyond noise issues)
- Median CT numbers of lung not dependent on slice thickness, recon kernel, or rad dose
- Metric to evaluate difference between CT scanner design is based on median of lung stabilization
- Mean continues to be most reliable measure, but not of most interest; better metric needed
- Metrics based on extreme values (e.g. -950 HU) used because they correlate well with pathology; additional metrics with pathology validation needed
- Dr Coxson mentioned the Madani et al *Radiology* papers on pathology validation as a possible starting point for COPD (<http://qibawiki.rsna.org/index.php?title=COPD-Asthma> under Reference Documents)
- Dr Judy to follow-up with Dr Stoel concerning additional pathology validation references
- Dr Judy to meet with Kyoto Kagaku company rep concerning an anthropomorphic phantom

QIBA Profile requirements

- Slides posted by Mr Kevin O'Donnell very helpful for understanding the Profiling process; Requirements Table lists what implementers need to know and do to comply (slide below for reference)
 - http://qibawiki.rsna.org/images/4/4a/Mr_ODonnell_QIBA_Process_Roadmap_20090629.ppt.pdf
- Current CT systems not calibrated for lung density; vendors may need to modify CT number scale or the investigators will have use CT scanners as built but calibrate measurements themselves
- Propose phantom that can confirm whether vendors have complied with the "Requirements Table" or will assist with calibrating output across imaging platforms
- ECLIPSE phantom study designed to understand differences between scanners and time
 - 2 scans separated by 3 years across 42 centers
 - No phantom/CT number corrections done yet
 - Pushback encountered by some academic departments when asked to perform a standardized protocol
- Introducing a research protocol into a clinical setting may cause issues; more questions associated with quantitation, i.e. a more demanding process
- Important to get radiologists and technologists "on board" with quantitation

Scientific abstract for RSNA 2010 annual meeting

- Mr Sieren has drafted the Methods section for a planned RSNA scientific abstract submission; will finalize and forward to Dr Judy for feedback

Next steps:

- Dr Judy to follow-up with Dr Stoel concerning additional pathology validation references
- Mr Sieren to forward RSNA abstract to Dr Judy for feedback – submission deadline is April 15
- Imaging Committee of COPDGene Study to meet during ATS meeting (New Orleans) on Saturday, May 15 at 4 PM (International House Hotel, New Orleans, Louisiana, QIBA members are welcome,
- Dr Levine to send Dr Gierada 8 foam samples to scan; to discuss off-line (zlevine@nist.gov)
- Next call scheduled for April 27th at 11 am CDT

Slide courtesy of Mr. Kevin O'Donnell (QIBA Quantitative CT Ctte)



REQUIREMENTS TABLE
Implementers need to know what they need to do to comply.

Actors	Activities Required to Claim Compliance
Acquisition Modality	<ul style="list-style-type: none">○ Acquisition System Calibration○ Image Acquisition○ Image Reconstruction○ Image Distribution
Measurement System	<ul style="list-style-type: none">○ Image Distribution○ Measurement○ Measurement Distribution
Radiologist	<ul style="list-style-type: none">○ Measurement○ Interpretation
Modality Tech.	<ul style="list-style-type: none">○ Acquisition System Calibration○ Image Acquisition
Reporting System	<ul style="list-style-type: none">○ Measurement Distribution○ Image Distribution
...	