

QIBA COPD/Asthma Committee Update  
September 15, 2010 at 2 pm CDT

Call Summary

In attendance	Juerg Tschirren, PhD
Philip F. Judy, PhD (Co-chair)	Susan A. Wood, PhD
Heather Chen-Mayer, PhD	
Harvey O. Coxson, PhD	RSNA
Zachary H. Levine, PhD	Joe Koudelik
Joshua Levy	Madeleine McCoy
Berend Stoel, PhD	

**Status of COPDGene Phantom modification**

- COPDGene Phantom modification distributed to this group for broad commentary; various foam densities needed for better measurement precision
- ROI regions of multiple foam sections were averaged to determine the standard deviation (SD) of means; SD of axial regions typically held within <1 HU
- New scanners create CT accuracy issues over large areas; additional discussion needed
- COPDGene Phantom mimics soft tissue in patients; leads to cupping issues due to scatter
- Dr Judy currently analyzing COPDGene Phantom data; trying to sort out possible sources of error
  - Simple design and simple analysis needed by Dr Crapo; Dr Crapo to follow-up with Mr Joshua Levy (The Phantom Labs) concerning a modified phantom design
  - Dr Judy to report analysis results in one month to the group
- Smaller/thinner tubes suggested
  - 1.0 mm – 25.0 mm diameter tubes proposed for new phantom design with two different wall thicknesses per diameter; center short tubes in the middle of the phantom; thin slices (e.g., 1 mm) proposed for 5 mm long internal tubes
  - Small tubes do not take up much space; 1, 2, 4, 8mm size doubling suggested with 10, 13, 17, 21, 25 mm size “jumps” will keep costs down
  - Machining limits and cost estimates needed to fabricate new design; polycarbonate suggested as durable material
  - Dr Judy welcomes feedback details of what is needed for price quote, any suggestions for eliminating internal structures, eliminating air holes, and consider re-designing phantom from scratch
- Proposed use for new phantom
  - Quality assurance purposes to evaluate possible variation between scanners
  - Reference standard
- May not be unreasonable to establish two or more phantom designs
  - One tool cannot be made to do everything
  - Different tools perform different tasks, e.g., CT scale reference phantom
- NIST recommendation of standard foams
  - Decision needed to incorporate four NIST foams in the COPDGene Phantom
- Dose affects on patients
  - Lung density scans typically associated with high dose
  - Concern of dose affecting noise; but dose impact on image measurement quality is a greater issue than dose risk on patient
  - Emphasis to be placed on how noise affects measurements; variance depends on dose
  - Standard techniques to measure lung density use constant mAs; schemas developed to modulate intensity
  - The “correct way” may not coincide with the “standard way” today

**RSNA 2010 Poster**

- Quality Control data from COPDGene Phantom proposed
- Poster could discuss effects of NIST “standard” foams
  - Drs Chen-Mayer and Levine to discuss Argonne scanning results when completed

**Status of Profile-UPICT**

- Dr Lynch will report on next call

**Next Steps:**

- Mr Joshua Levy to devise a set of tube sizes to approximate a cost; suggests that group look at literature to make suggestions; all encouraged to provide Dr Judy feedback
- Next call scheduled for Oct 6, 2010 at 2 pm CDT