

## QIBA COPD/Asthma Phantom Design Subcommittee Update

March 4, 2010

2 PM CST

### Call Summary

#### In attendance

Philip Judy, PhD (co-chair)

Andrew Buckler, MS

Zachary Levine, PhD

#### RSNA Staff

Fiona Miller

Joe Koudelik

#### Phantom Scanning Update (Dr Judy)

- Four phantoms scanned on Toshiba platform to compare CT numbers of internal air holes
  - COPDGene – original phantom with air hole
  - COPDGene – phantom with annulus air hole modification (acrylic ring)
  - ACR accreditation phantom
  - FDA Kyoto Kagaku phantom with tissue-equivalent material surrounding air hole
- Phantom air holes increase CT numbers, similar to CT numbers seen with air trachea
- -1005 to -970 HU range in tolerance according to the ACR accreditation phantom
- Air hole size itself may contribute to issues; COPD (w and w/o modification) and FDA phantom have 30mm air holes, while the ACR phantom contains a 25mm air hole
- Additional materials surrounding air holes may contribute to higher CT numbers as well
- Tools to evaluate effects of reconstruction filters needed; evaluation of median of air values, as opposed to means, due to truncation effects
- Dr Judy exploring local feasibility of rescanning all four phantoms with a Siemens Sensation 64
- Are B31, B35 or Sensation 64 differences due to adaptive filtering?

#### Foam Scanning Update (Dr Judy)

- Jan 28, 2010 UPenn foam scans discussed (“4 lb” foam samples blocks used)
- Reconstruction analysis discussed
- ROIs may be influenced by sections crossing over into neighboring foam samples; a positioning issue
- Average CT numbers over ROIs for both air hole and foam similar, with noise dominating the entire process
- CT values <-1024 HU are truncated by most scanners; a CT scale issue recognized by the community
- Foam of lower density deemed necessary; inserting 5x5x5cm<sup>3</sup> samples into the COPDGene phantom suggested

#### QIBA vs. COPDGene Activity

- Consideration to be given to role of COPDGene in relation to QIBA
- Group’s constitution to be reevaluated
- Efforts needed that apply to more than one project, e.g. broader in scale
- QIBA pathway to focus on:
  - Profile development
  - Experimental groundwork pursuit
  - Briefing Document for FDA regulators
- Dr Judy to pursue useful reference phantom for both COPDGene and QIBA/Asthma Project use

- Protocols to be collected and compared for longitudinal study use
- Consider looking beyond simple recalibration and develop phantom to test limitations
- Size metrics and spatial accuracy issues also to be addressed
- Drs Judy, Lynch, Crapo, Hoffman, and Silverman to discuss issues and needs off-line; additional face-to-face time needed to determine direction of QIBA / COPD efforts

#### Scanning of foam material (Dr Levine)

- Dr Levine pursuing reapplication for Argonne National Lab to scan additional foam samples; should have word concerning approval by April 2010

#### **Next steps:**

- Dr Judy to complete the analysis of foam block sets
- Scanning and analysis of foam blocks in plastic container proposed; Saran Wrap an alternative
- Drs Judy, Lynch, Crapo, Hoffman, and Silverman to discuss alignment of COPDGene and QIBA off-line; additional face-to-face time needed to determine direction of QIBA / COPD efforts
- Next call scheduled for Thursday, March 18<sup>th</sup>, at 2 PM CDT (3 PM EDT)