

QIBA COPD/Asthma LDRCS WG

January 11, 2012 at 2 PM CST

Call Summary

In attendance

Philip F. Judy, PhD (Co-chair)

John D. Newell, Jr., MD (Co-chair)

Paul L. Carson, PhD

Heather Chen-Mayer, PhD

Barbara Croft, MD

Sean Fain, PhD

Bernice Hoppel, PhD

Zachary Levine, PhD

Baojun Li, PhD

Frank Ranallo, PhD

Daniel C. Sullivan, MD

RSNA

Julie Lisiecki

PowerPoint Presentation by Dr. Judy

Topic: *Calibration and Use of Ring Insert in the COPDGene Phantom*

- Experiments were performed to identify scanner inconsistencies
 - Interested in effects of corrections on all 16 slice scanner data
- General conclusions:
 - CT numbers varied for air and NIST foams based on ring insert sizes
 - Inherent scanner variation seems to contribute to variation seen in emphysema metrics
 - Scanner recalibration introduces a large amount of deviation
 - It is important to specify a larger FOV in the protocol
 - To minimize scanner edge enhancement, a larger phantom model may be needed (or several together)

Manufacturer Calibration Procedures Background - Dr. Ranallo

- CT scanner manufacturers calibrate their machines in total air: Water = 0.0 HU; air = - 1000 HU
- Use of a 20 cm phantom to calibrate water – taking into account the scatter
 - These phantoms do not accurately simulate scatter
 - Air is grossly incorrect due to the function of slice thickness
 - Slightly more accurate/ lower on ACR and COPDGene phantoms
 - Measurements are not close to what is actually occurring with real patients
 - Dr. Fain suggested that the axial thickness of the phantom is the problem – not the material
 - -1000 HU was suggested as a measurement to be used for scanner equilibrium; however, this would mean that the scanner would not be accurately calibrated for other types of scans
 - The only solution is to do a linear correction for the COPDGene protocol
 - Dr. Li also pointed out that the larger FOV is a better choice to simulate a larger body
 - Important to note FOV size in the protocol
 - To minimize scanner edge enhancement – scan several COPDGene phantoms back-to-back to determine the “ideal” phantom size and help stabilize CT number in the center
 - Dr. Judy is particularly interested in the Brilliance 64

Next Steps:

- Drs. Li and Chen-Mayer to forward slides to RSNA for distribution to the group (complete)
- Next call will focus on Profile discussion and NIBIB project proposals for possible additional funding

Next calls:

- Next COPD/Asthma Technical Committee update call: **Wednesday, January 18, 2012 at 2 PM CST**
- Next COPD/Asthma LDRCS WG update call: **Wednesday, January 25, 2012 at 2 PM CST**