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**