

QIBA/COPDGene Subcommittee June Inaugural Call
June 9, 2009 at 9 AM CDT
Call Summary

In attendance:

Daniel C. Sullivan, MD (Moderator)
Philip Judy, PhD
Andrew Buckler, MS
David Lynch, MD
Edwin Silverman, MD, PhD
Michael McNitt-Gray
Rick Avila, MS

David Gustafson, PhD
RSNA
Fiona Miller
Susan Anderson
Joe Koudelik

General Discussion:

Purpose of this inaugural QIBA/COPDGene group call (Dr Sullivan)

- To determine where the COPDGene Imaging Committee is and how it functions
- To determine similarities to the Quantitative Imaging Biomarkers Alliance (QIBA) and if RSNA might play a role, i.e. relevance to COPDGene imaging efforts to be determined

COPDGene background

- National Heart, Lung and Blood Institute (NHLBI) funded program (<http://www.nhlbi.nih.gov>) through 2012
- Genome data collected from specimens and correlated with clinical and x-ray data
- Focus of imaging committee is the extraction of quantitative information from CT scans
- Imaging group has been active for approx 1 year
- Similar to QIBA in activities, i.e. attempting to improve quantitative imaging
- QIBA and imaging committee in COPDGene might take on complementary roles
 - e.g. RSNA might assist COPDGene with coordinating their imaging activities

COPDGene Grant and Study Overview (Dr Edwin Silverman)

- Understanding genetic determinants being pursued – i.e. interaction between inheritance and environment; current gene advances make this possible
- Identification of meaningful subgroups of COPD subjects needed
 - to determine syndrome of COPD
 - to understand heterogeneity of COPD
- CT scans now show interaction between phenotype definitions and disease severity, but more reliable and quantitative CT measurements are needed
- CT scans require better standardization
- A “best measurement” consensus is needed

COPDGene Imaging Section Overview (Dr David Lynch)

- COPDGene is focusing on quantitative imaging, pushing the “envelope” in many ways
- Identify and validate suitable cross platform CT attenuation measures
- Develop methods for correction of existing data
- Long-term: Textural analysis, more image data, online DICOM data set posting, etc

- 100's of parameters being assessed, e.g. bronchial wall thickness, lumen diameter, etc
- Serial studies not within current scope of COPDGene
- Within the next 18 months, the COPDGene Imaging Committee will attempt to (1) establish a "best measurement" for COPD, and (2) identify stability across various CT platforms
 - Dr Eric Hoffman's (U Iowa) phantom to be used to identify any discrepancies across different scanners and reconstruction filters

Two major COPDGene meetings held within the past year

- Full meeting of all COPDGene investigators
- February 2009 - an open meeting of the imaging group attended by representatives of major device manufacturers (GE/Philips/Siemens/Toshiba) to discuss the lack of system standardization, attenuation issues, and the need for newer, more suitable algorithms

QIBA Technical Committee Overview (Dr Daniel Sullivan)

- Parent and subcommittees host weekly calls, with email follow-up in-between
- Annual QIBA meetings held in May (2008 & 2009 in the Chicago area)
- QIBA Technical Committee evolution underway
 - QIBA Technical Committees to move towards a more generic modality definition with disease subfocus areas
 - For example, Volumetric CT Technical Committee will change to "General CT" with a broader sub-focus on cancer, COPD, etc
- QIBA currently submitting an unsolicited contract proposal to the NIBIB for two years of administrative and project funding

QIBA Volumetric CT Technical Committee Overview (Mr Andrew Buckler)

- Current efforts of the VolCT Technical Committee are taking on a two-fold (parallel) approach
- (I) Experimental groundwork to characterize performance in clinical context
 - Single center phantom
 - Retrospective phantom data
 - Accuracy with respect to clinical mark-ups
 - Multicenter clinical trials
 - Prospective clinical trial work in the future to further qualify scanner performance levels
- (II) Refinement of the profile (protocol)
 - Establish the manner in which equipment is to be used to achieve cross-scanner measurement consistency, i.e. mitigate user variances
 - Need to converge I and II to arrive at a profile for device manufacturers to adhere to
 - Known variability of performance characteristics can decrease via follow-on activities
- General measurement improvements expected
 - 1st benefit – Process template to apply to other clinical contexts, e.g., COPD
 - Qualification efforts lead to some similarities, thus there is a value to COPD via the QIBA efforts already laid down
 - 2nd benefit – QIBA technical expertise may provide insights to unique COPD issues

Relationship between QIBA and COPDGene imaging committee (Dr Philip Judy)

- COPDGene imaging committee currently deals with a broader spectrum of issues, QIBA maintains a narrower focus

- COPDGene imaging committee has a phantom as part of their quality assurance (QA) procedures across 20 different CT sites
- Numerous phantom scanning studies underway, e.g. Dr Harvey Coxson (Univ of British Columbia)
- QIBA strengths: doing inter-comparisons across CT sites based on phantom scans
- COPDGene Industry interaction remains informal with no real structured activities
 - Industry may be more comfortable within the QIBA process
 - QIBA profiles may benefit the COPDGene process
 - Toshiba/Siemens/GE & Philips taking on active roles

Structural Overview of COPDGene Main and Core Imaging Committees

- Subcommittee (core group) composed of 8-10 members, holding monthly conference calls
- Agreed upon imaging protocol based on group-designed phantom used
- Engaged with manufacturers
- Larger committee (main) composed of radiologists, holding monthly conference calls and resolving issues between calls via email – group engagement somewhat difficult

Synergy between QIBA CT and COPDGene Proposed

- Ad hoc COPDGene disease committee fits well within the QIBA CT Technical Committee structure - Groups/committees to share members
- Develop first profile to address COPD issues with a broader application to clinical trials
- Mr Andrew Buckler would provide needed support for communicating the QIBA methodology
- COPDGene would draw on the vast skill-sets of the QIBA membership

What COPDGene Needs from QIBA

- Structure that will engage device manufacturers in prospective ways, i.e. at a broader scope than the current funded study
- Fundamental mission of COPDGene is to evolve the current study to a longitudinal study, ahead of recruitment targets, eventually releasing data publically
- Improve standardization in imaging
- Interaction not limited to funding grant timelines
- A QIBA/COPDGene joint effort may engage vendors more effectively, thus moving the field forward
- Parallel involvement will strengthen these groups, perhaps leading to broader efforts beyond COPDGene

QIBA/COPD Subcommittee Proposed (within the QIBA CT “main” Technical Committee)

- All four participating vendors to assign a representative to the new subcommittee
 - GE/Philips/Siemens/Toshiba
- QIBA/COPD Subcommittee would be open to all interested – committee size not of concern
- Key element is to have imaging representative participate on all subcommittee calls
- Industry person to lead this subcommittee, but individual with the willingness to lead the group is most important
 - Representative also needed from pharma and academia
 - AstraZeneca and Glaxo Smith Kline (pharma) have been active within COPDGene

Next Steps:

- Follow-up t-con to be scheduled
- RSNA staff to inquire with Drs Judy, Lynch and McNitt-Gray concerning additional subcommittee member involvement
- Proposed agenda for next call:
 - Review the process
 - Select participants useful in the near-term
 - Get started