

QIBA Lung Density Biomarker Committee (BC)

Wednesday, March 31, 2021, 2 PM CT

Call Summary

In attendance

Charles Hatt, PhD (Co-Chair)	Stephen Humphries, PhD	Nancy Obuchowski, PhD
Miranda Kirby, PhD (Co-Chair)	Philip F. Judy, PhD	Sam Peterson, MS
Ehsan Abadi, PhD	Kai Ludwig, PhD	Josh Schirm, BSE
Raul San Jose Estépar, PhD	John D. Newell, Jr., MD	Gonzalo Vegas-Sanchez-Ferrero, PhD, MSc

RSNA

Joe Koudelik
Julie Lisiecki

Moderator: Dr. Hatt

Presentation of thoracic CT simulation software (Dr. Abadi)

- Dr. Abadi and his team have developed the first suite of computational COPD phantoms
- He shared his presentation entitled, "COPD quantifications via CT imaging: Ascertaining the effects of acquisition protocol using virtual imaging trial"
- CT quantifications are affected by radiation dose, current modulation, voltage of the tube, reconstruction algorithms, scanner makes and models, and new technology
- Dr. Abadi noted the following conclusions from his research:
 - Biomarkers are affected by imaging settings
 - Quantifying the effects of imaging parameters on accuracy and precision of CT quantifications makes more accurate quantification possible
 - Effect of recon kernels was greater than dose regarding quantification
 - Under the conditions studied:
 - Higher radiation dose, fixed milliampere-seconds (mAs), iterative reconstruction, and softer kernels result in more accurate and precise quantifications

Task Force Updates

- Both Task Forces met independently and are working on new biomarker proposals
- Dr. Kirby noted that the Airways TF did not discuss specific biomarkers, though they have ruled out Pi10 and are focusing on lumen and wall areas, due to the availability of repeatability and reproducibility literature, as well as broader disease applications
- Dr. Hatt said that the challenge will be in developing claims related to each individual method
- Dr. Newell suggested looking at RV volumes and using Dr. Abadi's simulation to test robustness of density metrics
- A [new biomarker proposal](#) will be needed to address five areas: *Transformational, Translational, Feasible, Practical, and Collaborative* for submission to the CT Coordinating Committee, and if approved, reviewed by the QIBA Steering Committee
- More information can be found on the QIBA wiki: http://qibawiki.rsna.org/index.php/Selection_Process

Parametric Response Map (PRM) Gas-trapping	Airway Measurements Analysis
Ehsan Abadi, PhD	Samuel Ash, MD, MPH
Sean Fain, PhD	Raul San Jose Estepar, PhD
Chuck Hatt, PhD	Philip F. Judy, PhD
Joe Mammarrappallil MD, PhD	Miranda Kirby, PhD
*John D. Newell Jr., MD (just added)	John D. Newell Jr., MD
Lars Nordenmark, PhD	Nancy Obuchowski, PhD
Yoshiharu Ohno, MD, PhD	Samuel Peterson, MS
Gonzalo Vegas-Sanchez-Ferrero, PhD, MSc	Claudio Silva, MD, MSc

- For detailed descriptions of biomarkers, please see [notes](#) posted to the [Lung Density BC QIBA wiki page](#)

Profile Update (Dr. Hatt)

- Dr. Fain is working with Mr. Avila to move the Lung Density Profile from the Consensus Stage (Stage 2) to Technically Confirmed (Stage 3)

At least three sites need to be identified to test the Profile using the checklist in a feasibility test, and to provide feedback to the BC using an electronic format that would capture their responses, e.g., Google forms or other

Action items (ongoing):

- Dr. Hatt to also invite Dr. Newell to the gas-trapping task force
- Dr. Fain to send Checklist to co-chairs and Dr. Humphries for review/feedback
- Continue discussion of multi-parametric Profile suggestions on next call
- Dr. Humphries volunteered to add the checklist to his group's phantom scanning efforts with the COPDGene study, and asked for a brief description with instructions, which Dr. Fain offered to format

Next meetings: 4/28, 5/26