

QIBA Lung Density Biomarker Committee (BC) Call

January 22, 2020 at 2 PM (CT)

Call Summary

In attendance

Sean Fain, PhD (Co-Chair)

Charles Hatt, PhD (Co-Chair)

Ehsan Abadi, PhD

Stephen Humphries, PhD

Philip F. Judy, PhD

Nancy Obuchowski, PhD

Sam Peterson

Gonzalo Vegas-Sanchez-Ferrero, PhD, MSc

RSNA

Joe Koudelik

Julie Lisiecki

Moderator: Dr. Hatt

Introductions of new members:

- *Dr. Ehsan Abadi (Duke University), Postdoctoral Research Fellow*
 - Research interest includes simulations for medical imaging using computational models with human subjects and scanners
 - Working on a COPD related grant, focused on accuracy and variability of COPD quantification across different protocols
- *Sam Peterson (VIDA), Principal Algorithm Scientist*
 - Previously worked with Vital Images for 13 years
 - Work focus is image segmentation and visualization paradigms and lung imaging applications

Overview (Dr. Hatt):

- The QIBA Lung Density BC Profile is at a transition stage
- Once public comments are addressed, a vote will be held to publish the Profile as Consensus (Stage 2)
- Following Consensus, the BC must consider how to move the Profile forward Technically Confirmed (Stage 3)

Profile Public Comment Review:

- Dr. Hatt will assign Public Comment resolution issues to BC members based on their expertise
 - Assignments will be included in the comment resolution spreadsheet under the “owner” column
 - Dr. Hatt is considering using a Google sheet for ease of sharing
- Dr. Fain has addressed many of the AAPM comments; some BC discussion is needed regarding more complex/technical comments
- Dr. Fain also addressed 20 of the 78 comments provided by Mr. O’Donnell
 - Help is needed to address the remaining comments
- It was noted that parts of the Profile may be suitable for publication

Follow up items:

- There may be discrepancies or differences of opinion regarding scanner equilibrium
- Need to consider tissue attenuation and how to determine the dose level in a more patient-specific way
- This may be the basis for a future groundwork project
- It will be necessary to remain flexible enough for various vendors to meet requirements
- Will also want to look at the reverse cupping artifact

Future Profiles under consideration:

- Gas-trapping was discussed as a possible future biomarker for Profile consideration
- Airway analysis may prove to be too difficult, as the procedure for computing Pi10 is very complex and may have too much inter-software variability
 - Mixed feedback has been received regarding Pi10 due to systematic errors, depending on the number of airways that can be segmented; alternatives are uncertain

- Parametric Response Mapping (PRM) may also be considered, as it is a non-invasive technique that measures lung density during inhalation and exhalation
- BC co-chairs may compile a list of ideas and ask BC members to vote at a future time

Profile Stages:

- In order to officially reach the Profile stage of Consensus, the BC must complete its response to the public comments received and request a vote to publish at the BC level (followed at the CT CC level)
- Drs. Hatt and Fain agreed that review of the [Profile Stages](#) is needed
 - Checklists and Conformance Procedures must also be established
- It was discussed that there may be a possibility to leapfrog to the implementation stage if the Profile can be implemented in a clinical trial
- The [American Lung Association](#) (ALA) has an upcoming trial with at least a dozen sites, and that might be an excellent opportunity to test the Profile
 - The trial will start in approximately six months and may have 500 - 1,000 subjects
 - Dr. Fain to reach out to Dr. George Washko, overall PI of the ALA trial, as he is in the process of defining the protocol
 - Dr. Vegas-Sanchez-Ferrero to follow up with PIs to ask if the Profile might be used

Action items (some from previous call):

1. BC members may be assigned follow up items (based on expertise) to resolve public comment questions and report back to the BC on the next call (Dr. Hatt to follow up with Dr. Fain)
2. Make progress on reaching out to sites to obtain a repeatability dataset for CAC and lung density in LCS data. Not certain who the best contact would be. (Dr. Hatt to ask Ella.)
3. Reach out to leaders of the American Lung Association study (that is in planning) regarding a possible qualification for the Profile (Dr. Lynch)
4. Dr. Fain to follow up with Mr. O'Donnell (QIBA Process Cmte Chair) re: next steps for Profile advancement

Next meetings:

02/19	Q1 CT CC – Wed, 2/19 @ 1 pm CT
02/26	Lung Density BC
03/25	Lung Density BC
04/22	Lung Density BC

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