



Quantitative  
Imaging  
Biomarkers  
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# Pulse-Echo Quantitative Ultrasound Biomarker Committee

BC conference call – Aug 7, 2020, 11:00 EDT

# Agenda

- Introduction of WG co-chairs and last week's call summary
  - Backscatter (co-chairs Theresa Tuthill, Aiguo Han, Roberto Lavarello)
  - Sound Speed (co-chairs Theodore Pierce, Stephen Rosenzweig)
  - Attenuation (co-chairs Viksit Kumar, Arinc Ozturk, Richard Barr)
  - Phantom (co-chairs Tim Stiles and David Fetzer)
- Discussion of issues raised in last week's calls
  - Methods for sharing documents in literature search
  - Inclusion criteria for methods and systems to be tested in multi-site study – Special focus on Fibroscan
  - Selection of reference method for verifying phantom properties

# Methods for sharing documents in literature search

- Excel file
- Mendeley Group
  - Separate folders for each WG

The screenshot displays the Mendeley Desktop application interface. At the top, there are navigation tabs for 'Feed', 'Library' (which is selected), 'Suggest', 'Groups', and 'Dat'. Below the navigation is a toolbar with an 'Add' button and options for 'Add to' and 'Delete'. The main area is divided into a left sidebar and a main document list.

**MY LIBRARY**

- All Documents
- Favorites
- My Publications
- Recently Read
- Recently Added

**FOLDERS**

- Create Folder...

**GROUPS**

- Create Group...
- DukeUltrasound
- QIBA PEQUS
  - Attenuation WG
  - Backscatter WG
  - Phantom WG
  - Sound Speed WG
  - QIBA SWS

**TRASH**

The main document list shows a table of items with checkboxes, titles, authors, and dates. The items are:

| Checkbox                 | Title   | Author  | Date     |
|--------------------------|---|---|----------|
| <input type="checkbox"/> | Bayesian speckle tracking. Part I: An implementable perturbation to the likelihood function fo... | Byram B, Trahey G, Palmeri M  | 10/02/17 |
| <input type="checkbox"/> | Ultrasound Measurements and FDA Criteria for Display of New Quantitative Measures                 | Garra B   | 05/03/16 |
| <input type="checkbox"/> | Ultrasound Shear Wave Speed Estimation in Elastic Phantoms: Sources and Magnitude of ...          | Milkowski, A, Hall, T, Andre, M, Carson, P, Chen, S, Cohen-Bacrie, C, Franchi-Abella, S, Garra, B, McAleavey, S, Met... | 05/03/16 |
| <input type="checkbox"/> | RSNA QIBA Ultrasound Shear Wave Speed: Sources of Variability in Phantoms, Simulation...          | Carson P, Milkowski A, Hall T, et. al.  | 05/03/16 |
| <input type="checkbox"/> | Quantitative Imaging Biomarker Alliance Shear Wave Speed Imaging: Making It Much More ...         | Hall T, Milkowski A, Garra B, et. al.   | 05/03/16 |
| <input type="checkbox"/> | QIBA Technical Committee for Shear Wave Speed (SWS) Measurement                                   | Cohen-Bacrie C, Garra B, Hall T, et. al.  | 05/03/16 |
| <input type="checkbox"/> | QIBA Technical Committee for Shear Wave Speed (SWS) Measurement                                   | Cohen-Bacrie C, Garra B, Hall T, et. al.  | 05/03/16 |
| <input type="checkbox"/> | The Radiological Society of North America's Quantitative Imaging Biomarker Alliance effort t...   | Hall T, Garra B, Milkowski A, et. al.   | 05/03/16 |
| <input type="checkbox"/> | RSNA/QIBA: Shear wave speed as a biomarker for liver fibrosis staging                             | Hall T, Milkowski A, Garra B, et. al.   | 05/03/16 |
| <input type="checkbox"/> | Quantitative Imaging Biomarker Alliance Shear Wave Speed Imaging: Making It Much More ...         | Hall T, Milkowski A, Garra B, et. al.   | 05/03/16 |
| <input type="checkbox"/> | RSNA/QIBA: Shear wave speed as a biomarker for liver fibrosis staging                             | Hall T, Milkowski A, Garra B, et. al.   | 05/03/16 |
| <input type="checkbox"/> | RSNA QIBA Ultrasound Shear Wave Speed: Sources of Variability in Phantoms, Simulation...          | Carson P, Milkowski A, Hall T, et. al.  | 05/03/16 |
| <input type="checkbox"/> | The Radiological Society of North America's Quantitative Imaging Biomarker Alliance effort t...   | Hall T, Garra B, Milkowski A, et. al.   | 05/03/16 |

At the bottom right, there is a page indicator: '1 to 50 of 339'.

# Inclusion criteria for methods and systems to be tested in multi-site study

1. PEQUS techniques supported by evidence of continuous development in the literature (simulations, phantom-based studies, pre-clinical and clinical implementations)
2. Conformance to initial consensus on
  - How to measure (e.g., frequency range, depth)
  - How to report (type of metric)
3. Documented hardware and software configuration. Examples:
  - Data acquired and processed on commercially released systems
  - Data acquired on commercially released systems (e.g., GE RF data capture), processed offline
  - Data acquired on modified commercially released systems (e.g., Siemens URI), processed offline
  - Data acquired on research systems (e.g., Verasonics), processed offline

# Should Fibroscan CAP be included?

## Pros:

- Substantial clinical evidence (10 years)
- Inclusion may lead to better understanding of relationship between CAP and image-based attenuation

## Cons:

- Proprietary technique, unclear if CAP (dB/m) = attenuation reported by imaging systems (dB/cm-MHz)
- Conformance to measurement and reporting standards may not be possible
- Unclear if additional requirements are needed for phantoms

# Proposed Strategy for Fibroscan

Consider imaging-based US methods as “core technology”

Consider CAP as “non-core technology”

- First priority is to design the phantom, define measurement protocol and reporting methods for the “core technologies”.
- Endeavor to have the phantom work for CAP as long as the first priority is achieved.
- Our goal is to reduce measurement bias and variability across the “core technologies”.
- Reducing measurement bias and variance between CAP and “core technologies” is out of scope, but would encourage Fibroscan to consider doing so.

# Selection of reference method for verifying phantom properties

- Reference method for calibrating phantom should be independent of PEQUS techniques in consideration for multi-site study
  - For example: Narrow-band substitution, through-transmission for attenuation and sound speed
  - Backscatter? (by definition, pulse echo)
- Selection of reference method to be done by Phantom WG, with agreement from each Biomarker WG.

Other issues from last week's calls?



# Next BC Call

Date: Sep 4, 2020

Time: 11:00 am, EST

Reminder to WG co-chairs to set Aug call agenda