PULSE-ECHO QUANTITATIVE ULTRASOUND BIOMARKER COMMITTEE

Agenda for Friday, September 3, 2021

11:00am – 12:00pm

Attendees: Ivan Miguel Rosado-Mendez (Co-Chair), Michael Wang, (Co-Chair), Michelle Alexander, Stephane Audiere, Paul L. Carson, , Guy Cloutier, Aaron Engel, Todd Erpelding, Raul Esquivel, David Fetzer, Jing Gao, Timothy Hall, Aiguo Han, Viksit Kumar, Roberto Lavarello, Tian Liu, Ravi Managuli, Stephen McAleavey, Kibo Nam, Gary Ng, Arinc Ozturk, Theodore Pierce, Michelle L. Robbin, Stephen Rosenzweig, Jonathan Rubin, Paul Sidhu, Timothy Stiles, Michael Thornton, Theresa Tuthill, Xiaohong Wang, Keith Wear, James Zagzebski, Nancy Obuchowski

AIUM Staff: Kelly Phillips

TOPIC	COMMENTS	ACTION ITEMS
Introduction	Welcome (3 min)	
Donations	Report on donations (MW, 5 min)	
Position Paper	Report on position paper (IRM and DF, 2 min)	

Work Groups	Work Group Progress Reports a. Phantom (10 min) • Update on specifications • Report of prototype characterization b. Backscatter (10 min) • Status of drafts of summary document and/or manuscript • Status of drafts of claims • Status of measurement protocol and spreadsheet c. Sound Speed (10 min) • Status of drafts of summary document and/or manuscript • Status of drafts of claims • Status of measurement protocol and spreadsheet d. Attenuation (10 min) • Discussion on how to report attenuation (specific attenuation [dB/cm-MHz], attenuation vs. frequency slope [dB/cm-MHz], attenuation at 3 MHz [dB/cm @ 3 MHz]) • Status of drafts of claims • Status of measurement protocol and spreadsheet	
Discussion	Discussion (10 min) 1. In the last Attenuation WG meeting, it was raised that some vendor systems place limitations on the size and location of the measurement area. These factors could affect accuracy and precision. If vendors are willing and able, should we allow offline measurements on acquired data to be used for analysis to make measurement size/location similar among vendors?	IRM – will reach out to manufacturer representatives via Basecamp Biomarker working groups: finalize their own measurement protocol Deadline is end of September Basecamp or email to David F, Tim S, or Ivan

	2. Unified measurement protocol for the 3 biomarkers. The plan is for each Biomarker WG to finalize their own measurement protocol (end of Sept?) and then to consolidate into a single document with common shared steps wherever possible.	
NEXT CALL	Date: October 1, 2021 Time: 11:00am, EST	

MW – Donations

- Additional vendors have reached out for help in submitting applications; RSNA to submit applications for funding

IRM – Position Paper

- First complete draft was distributed among authors; hoping to submit the paper by 9/15
    - Send any comments you still have

TS – Phantom WG

- Current Work – concerns about the size of the phantom and reflections from the side walls
    - Does anyone have time or ideas to share the results of a test?
        - Look for differences in measuring properties with the transducer oriented along the long axis of the phantom rather than the short axis
- Results of Test
    - Physical size of phantom used (or make and model of commercial phantom)
    - Results of measurements of speed, attenuation coefficient or BSC in both orientations
    - Transducer and settings used
- Prototype samples from Sun Nuclear
    - Some prototypes have been measured by Ivan, Tim H and others from UW-Madison
        - Ivan reviewed results – validation of imperfect reference methods, speed of sound, attenuation, container samples and reflection

TT – Backscatter WG

- Summary document
  - Gaps identified and are being filled in
- Manuscript
  - To follow format of Attenuation WG paper to Radiology
  - Current gap is review of current vendor non-BSC (i.e. kidney/liver ratio)
- Draft of claims
  - Limited as no vendors offer BSC
  - MW – put placeholders for things like accuracy and precision and leave it as a template to be refined after receiving data from the multi-site study
- Measurement protocol and spreadsheet
  - Similar to Attenuation WG
- Pairing academic sites with vendor
  - Ivan provided info
  - Need to determine which sites have ongoing research agreement to use RF that vendor wants tested
- Attenuation compensation
  - Anil Chauhan to analyze (fat/muscle annotation); more images provided by Dr. Barr

AE – any thought into verification of the backscatter coefficient on homogeneous phantoms when assuming a belly fat layer in that phantom that may not be there

RL – Discussed with phantom group - not going to use intervening tissues, but another type of materials

IRM – For the first round, adding that source of variability will make the study very complex; on a second round, we can reduce the number of participating institutions and specifically address the intervening tissues as a possible source of variability

TH – study adding aberrating layer on top of existing phantoms – control over attenuation and sound speed

SR – Sound Speed WG

- Manuscript Status
  - Outline completed and sections assigned to group members
  - Target for each section draft is in 2 weeks
- Claims Draft
  - Current draft is posted to Basecamp
- Measurement Protocol/Spreadsheet
  - Current draft is posted to Basecamp
  - Requesting input from vendors with SoS estimation on their products

VK – Attenuation WG

- Discuss the measurement protocol depth
  - Asked vendors to fill out vendor specific information (received from 9 vendors)
- Proposed depth of center of ROI for phantom measurements:
  - 3,4,5,6,7 cm
  - Leave as tentative until we receive a set of the phantoms, then do a feasibility check; effort to find a depth when the biomarkers start to fail
- Some consensus on limiting the ROI size
  - Minimum ROI size of 1 cm * 1 cm
  - Maximum size or vendor specified size, needs more discussion

TP – is it possible to standardize the depth measurements across different biomarkers to make the phantom study more simple, rather than having separate depths for each biomarker?
IRM – that will depend on the recommendations from each of the biomarker working groups – once we get the recommendations from each working group, we will identify the points of convergence and agreement and try to simplify the protocol as much as possible.

IRM – Discussion

1. In the last Attenuation WG meeting, it was raised that some vendor systems place limitations on the size and location of the measurement area. These factors could affect accuracy and precision. If vendors are willing and able, should we allow offline measurements on acquired data to be used for analysis to make measurement size/location similar among vendors?
    - MW – if we want to standardize measurement area and location among the different vendors to make them as similar as possible, we should allow vendors to perform the measurements offline if necessary – should make clear that its being done using a tool that's not commercially available

        IRM – would only the manufacturers test at their sites or have to provide access to other institutions

        MW- if possible to export images from the sites, manufacturers could do the analysis using the exported images if they are able to get access to the data from each site; or have the manufacturers provide the tool to each site to do the measurements – may be limitations

        IRM – can communicate through Basecamp with the representatives from different manufacturers and see who is willing to do this type of analysis

        MA – Samsung would require a research agreement to do any type of offline analysis

2. Unified measurement protocol for the 3 biomarkers. The plan is for each Biomarker WG to finalize their own measurement protocol and then to consolidate into a single document with common shared steps wherever possible.
    - Deadline is end of September – need the documents from each of the biomarker WG to be sent by Basecamp or email to David F, Tim S, or Ivan