QIBA Ultrasound Shear Wave Speed (SWS): System Dependencies Subcommittee

Friday, February 15, 2012; 11 AM CT

Call Summary

In attendance

Mark Palmeri, MD, PhD (Co-Chair)	Timothy J. Hall, PhD	Nicolas Rognin, PhD	**RSNA**
Keith Wear, PhD (Co-Chair)	Christopher Hazard, PhD	Daniel Sullivan, MD	Joe Koudelik
Paul L. Carson, PhD	Andy Milkowski, MS	Hua Xie, PhD	Julie Lisiecki
Shigao Chen, PhD	Kathy Nightingale, PhD		

Moderator: Keith Wear, PhD

Notes provided by Drs. Wear and Palmeri

1. **Call summary from previous teleconference approved with no comments.**
2. **Inter-laboratory comparison of phantom shear wave speed measurements**
    a. Participants were reminded to keep their phantoms at their sites and not send them back to Duke unless requested to do so at a later date.
    b. Participants were asked to send the list of ultrasound machines that they will use in the phantom study to Tim/Brian/Andy/Julie
    c. Mark Palmeri confirmed with Claude Cohen-Bacrie that SSI had received its phantom. Now the only remaining laboratory without confirmation of received phantom is EchoSens.
    d. Tim Hall said that EchoSens will forward their phantom to Jeff Bamber for measurements.
    e. Participants were asked if there were any problems or questions with the phantom protocol or spread sheet results form. Nobody expressed any problems or questions. Andy Milkowski said that Siemens had completed measurements with 3 appraisers without problems.
3. **Reconstruction Algorithms / Simulation & Phantom Data**
    a. Mark Palmeri offered to make available simulation datasets to test SWS reconstruction algorithms. Mark showed FE simulations of acoustic-radiation-force excitations in phantoms. Datasets consist of 3D (depth, lateral, elevation) displacement data.
    b. Users could use their own software to generate simulated scatterers throughout 3D space and then look up displacement information in the simulated displacement dataset. Users could then write their own software to simulate pulse-echo methods for tracking scatterer movements to measure shear wave speed.
    c. Kathy Nightingale suggested this software could be used to answer specific questions that the subcommittee would like to ask.
    d. Two limitations are that simulations can be quite time-consuming and datasets can be quite large (several gigabytes).
    e. Mark Palmeri asked what data format(s) would be most convenient for users.
    f. The software can simulate various degrees of viscosity. So far Mark has done the pure elastic case.
    g. The software can handle both single and multiple focal depth excitation. Kathy Nightingale added that this makes a big difference in lossy phantoms. The software can simulate high attenuation.
    h. The software could be used to simulate various commercial devices, but there are potential proprietary issues associated with companies disclosing their device specifications required as inputs to simulation.
    i. Simulated data could possibly be made available on the RSNA/QIBA host server or a server at Duke.
    j. Potential Open Source methods for distributing simulation software were discussed.
4. **Manuscript based on literature database**
    a. The group discussed potential for a publication based on meta-analysis of the Mendeley database. Should the publication be limited to purely system dependencies, or expanded to some degree to include biological confounders?
    b. Such analysis might include spectral information from systems, but companies may be reluctant to publish such information. However, now that we have a standard phantom, it may be possible to measure spectral information on all systems in a consistent way.

c. The group discussed statements on elastography from WFUMB and EFUMB and tried to discuss what QIBA could offer to complement them. It was suggested that QIBA documents would be more technical in nature (meta-analysis, confounding factors, etc.) than WFUMB and EFUMB statements.
d. It was suggested that the Clinical Subcommittee consider greater involvement in this effort.

Next steps:

- Participants to send the list of ultrasound machines to be used in the phantom study to the following: (Brian.Garra@fda.hhs.gov; tjhall@wisc.edu; andy.milkowski@siemens.com; jlisiecki@rsna.org)

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QIBA US SWS March call schedule:

Date	Time (CT)	Day	Committee/ Subcommittee	Moderator
3/04/2013	1:00 pm CT	Monday	US SWS Technical Committee	Dr. Garra
3/08/2013	11:00 am CT	Friday	System Dependencies Subcommittee	Dr. Palmeri
3/11/2013	1:00 pm CT	Monday	Phantom System Testing & Measurement Subcommittee	Dr. Hall
3/18/2013	1:00 pm CT	Monday	Clinical Applications & Biological Targets Subcommittee	Dr. Samir