

**QIBA Ultrasound Shear Wave Speed (SWS) Combined Call:  
System Dependencies and Phantom-System Measurement Testing Subcommittees**

Friday, July 11, 2014; 11 AM CT

Call Summary

*Notes provided by Dr. Wear*

**In attendance**

**Mark Palmeri, MD, PhD (Co-Chair)**

**Keith Wear, PhD (Co-Chair)**

S. Kaisar Alam, PhD

Michael André, PhD

Jun Chen, PhD

Steven Fick, PhD

Christopher Hazard, PhD

Ted Lynch, PhD

Stephen McAleavey, PhD

Yasuo Miyajima, MS

Kathy Nightingale, PhD

Nancy Obuchowski, PhD

Nicolas Rognin, MSc, PhD

Ned Rouze, PhD

Vijay Shamdasani, PhD

Daniel Sullivan, MD

Matthew Urban, PhD

**RSNA**

Julie Lisiecki

Madeleine McCoy

**Moderator:** Keith Wear, PhD

**1. Recent results from Duke on Phase II phantom measurements**

The Duke group presented values of shear wave velocity at 200 Hz,  $c(200\text{ Hz})$  in m/s, and dispersion,  $dc/df$  in m/skHz, for 6 phantoms that have been developed in search of good recipe for the Phase II phantom inter-laboratory comparison study. The phantoms are made by Ted Lynch of CIRS and are labeled E2250-X where X = 1, 2, 3, 4, 5, or 6. The Duke group plotted  $dc/df$  vs  $c(200\text{ Hz})$  for all 6 phantoms. The six data points were superimposed on measurements of  $dc/df$  and  $c(200\text{ Hz})$  in 107 patients.

	<b><math>c(200\text{ Hz})</math> (m/s)</b>	<b><math>dc/df</math> (m/skHz)</b>	<b>Attenuation Slope (dB/cmMHz)</b>
<b>Phantom E2250-1</b>	<b>2.1</b>	<b>7.5</b>	
<b>Phantom E2250-2</b>	<b>1.8</b>	<b>5.8</b>	
<b>Phantom E2250-3</b>	<b>3.4</b>	<b>6.0</b>	<b>0.59</b>
<b>Phantom E2250-4</b>	<b>2.9</b>	<b>4.2</b>	
<b>Phantom E2250-5</b>	<b>2.8</b>	<b>4.0</b>	<b>0.34</b>
<b>Phantom E2250-6</b>	<b>2.6</b>	<b>4.2</b>	
<b>Mean values in 107 livers</b>	<b>2.5</b>	<b>6</b>	<b>0.5?</b>

All values are approximate.

Samples 1 and 2 are too soft and are probably not appropriate for this study. Sample 3 is the stiffest. Samples 3-6 seem potentially appropriate for the study. Ted Lynch remarked that viscosity is not independent of attenuation. Samples 4-6 had a reasonable attenuation and were near the border line between Metavir F2 and F3.

Ted Lynch remarked that the attenuation was nonlinear and that the quoted slope values were linearizations (with frequency) across a frequency band. Measurements were made from 2 to 5.5 MHz, which is reasonable for clinical scans of liver.

Higher attenuation leads to lower SNR.

It was decided that phantoms 3 and 5 might be a good pair to distribute. It would be nice to generate another phantom near  $c(200\text{ Hz}) = 2\text{ m/s}$  and  $dc/df = 2\text{ m/skHz}$ . Ted Lynch said that such a phantom would be feasible

Plan: Make 3 phantoms:

1. One phantom similar to 1 and 2 in  $c(200\text{ Hz})$  but with lower  $dc/df$  (normal liver)
2. One phantom like 5 (borderline F2/F3)
3. One phantom like 3 (more advanced fibrosis)

Ted will make 3 sets of 3 phantoms to distribute to 2-3 initial test sites (Duke, Mayo, plus one more – e.g., Rochester or SSI). The sub sites might exchange phantoms and repeat measurements to look for sample differences. These phantoms will be too small for MRE systems. They will just be for the purpose of validating and refining the recipes.

Mark will follow up with SSI to gauge their interest in participating in this phantom test.

**Remaining July Call:**

- **Friday, July 18, 2014:** US SWS Technical Committee Call – Dr. Hall
- **Friday, July 25, 2014:** Clinical SC – Dr. Samir – *call cancelled* – next call will be **August 8th**

**[Conferences for Ultrasound](#)** on QIBA Wiki

RSNA Staff attempt to identify and capture all committee members participating on WebEx calls. However, if multiple callers join simultaneously or call in without logging on to the WebEx, identification is not possible. Call participants are welcome to contact RSNA staff at [QIBA@RSNA.org](mailto:QIBA@RSNA.org) if their attendance is not reflected on the call summaries. [QIBA wiki](#)