

**QIBA Contrast Enhanced Ultrasound (CEUS)
Quantification of Analysis Software Task Force Call**

Tuesday, February 7, 2017; 3 PM CT

Notes provided by Dr. Averkiou

In attendance			RSNA
Mike Averkiou, PhD (Co-Chair)	J. Brian Fowlkes, PhD	Beth McCarville, MD	Julie Lisiecki
Wui Chong, MD	Sara Keller, PhD	Michelle Robbin, MD	
Vinay Duddalwar, MD, FRCR	Mark Lockhart, MD, MPH	Theresa Tuthill, PhD	
Todd Erpelding, PhD, MSE	Ravi Managuli, PhD RDMS	Stephanie Wilson, MD	

Moderator: Dr. Averkiou

Call summary: We held the first quantification software (s/w) requirements task force meeting and discussed the following items:

1. **Linearization of data.** All time intensity curve (TIC) quantification s/w should operate on linear/linearized data (not logarithmically compressed).
2. **S/W may be either online or offline.**
 - The goal in the future will be to use the phantom setup with specific flow conditions in multiple sites with different systems/software and generate the same TIC and CEUS parameters.
 - The preference is to have the quantification s/w both online and offline.
3. **Curve fit model.** Different companies use different curve fit models.
 - Some use standard modes (from indicator dilution) and some use empirical models.
 - Since the role of the curve fit model at the present time is for removing noise and quantification parameter extraction (and standardization), it would be advisable to agree on a single model (e.g. lognormal?) and make sure all vendors offer it.
4. **What quantification parameters to extract:** There are a large number of parameters with different s/w available. We should agree on a few common and basic parameters that everybody outputs.
 - Based on the indicator dilution models (see for example, PMID: 20529706, or PMID: 22302501, or PMID: 22843433), we can consider as standard the following parameters:
 - washin time WT (also referred to as rise time RT, time it takes from zero to max),
 - mean transit time MMT (first moment of the curve),
 - peak intensity PI, and
 - area under the curve (AUC)
5. Participants on the call have experience with the following s/w:
 - QLAB/QSTATION Philips
 - VueBox Bracco
 - GE quantification s/w
 - TCA Toshiba
 - TIC Hitachi
6. **Comparison between results from different s/w.** Now this is not possible as different researchers have results that are not comparable.
 - Some s/w give negative intensity values that are hard to interpret.
 - Hopefully the linearization process will be a step towards standardization.
7. All quantification s/w validation should be performed by the individual vendors by setting up the same phantom as the QIBA members; Drs. Averkiou and Hoyt are producing standard time-intensity curves.

Action items:

1. Industry participation from all major imaging manufacturers is needed. No representatives from GE, Philips, Siemens or Bracco were available. Only Toshiba and Hitachi were present. It would be helpful to have at least one person per company.
2. A request has been made to all vendors to provide a version/platform of their quantification s/w to be included in the QIBA committee activities.
 - The goal will be to use software that works on multiple systems with multiple tasks, capable of generating the same output data
 - Please provide data to Dr. Averkiou (maverk@uw.edu), who will catalog the software being used
3. Dr. Averkiou to report on monthly QIBA CEUS call on this task force meeting.

Ultrasound CEUS BC QIBA wiki page: http://qibawiki.rsna.org/index.php/Ultrasound_CEUS_BC

WebEx Calls:

Please **SAVE-the-DATES** for the following CEUS Task Forces – per doodle poll results:
{Dates / times may change per co-chair preference.}

- Literature Review: Thursday, **February 23rd** @ 3 pm CT
 - Imaging Systems: Thursday, **March 9th** @ 1 pm CT
 - Basic Science: Thursday, **March 9th** @ 3 pm CT
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- **Feb 10:** US SWS Clinical Task Force (Dr. Dhyani)
 - **Feb 17:** US Coordinating Committee
 - **Feb 24:** CEUS BC (Dr. Averkiou)
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