QIBA Contrast Enhanced Ultrasound (CEUS) Biomarker Committee (BC) Call

Friday, April 13, 2018; 11 AM CT

Call Summary

In attendance			**RSNA**
Mike Averkiou, PhD (Co-Chair)	Madison Gallagher	Nancy Obuchowski, PhD	Joe Koudelik
Todd Erpelding, PhD, MSE (Co-Chair)	Christian Greis, PhD	Hugo Robert, MSc	Julie Lisiecki
Vinay A. Duddalwar, MD, FRCR	Kenneth Hoyt, PhD, MBA	Thierry Rognard	

Moderator: Dr. Averkiou

Discussion included:

- A few prospective participants from the AIUM meeting have asked to join the group; Dr. Averkiou will forward contact information to RSNA staff
- Dr. Averkiou provided an update from his presentation at AIUM 2018 regarding decisions that the group has made thus far, which include:
    - Bolus kinetics (wash in – wash out) will be used
        - Infusion with destruction replenishment may be considered at a later stage
    - Clinical application will be liver lesions
        - Other applications to follow may be IBD, kidney, prostate, etc.
    - Use of only linear or linearized data
    - Collection of one minute loops
    - Curve fit lognormal distribution model (or LDRW, or similar)
        - Published paper by Strouthos, et al, is a good reference on these specific models and their applicability
    - Extraction of data will be completed using the following quantification parameters: RT, MTT, AUC, and PI
        - The CEUS quantification parameters are flow (Q) and vascular density related

Software systems:

- Bracco Vuebox: May be used with multiple / all imaging systems; it uses a linearization scheme
- Philips: QLAB, QStation – uses native linear data
- GE: TIC Analysis – uses native linear data
- Canon: Time Curve Analysis (TCA)- uses native linear data
- Siemens, Hitachi – to be determined

Time-Intensity Curves (TIC) from clinical studies:

- Data from a number of various liver lesions were collected and TICs (both the lesions and normal parenchyma) were plotted to be used as a guideline when designing the phantom
- The lesions included HCCs, mets, FNH, and normal parenchyma
- Recirculation is very important when curve fitting to clinical data, though this does not apply to phantom studies

Next steps / items for further discussion:

- Establishing nondestructive MI
- Intensity vs. concentration
    - The basic premise is that higher bubble concentration leads to higher intensity (linear relationship limited by signal saturation and acoustic shadowing)
- Selection of "optimal" concentration (middle of linear range)
- Inter-vendor imaging/analysis software variability
    - Inter-vendor variability is important to include in the Profile to indicate what discrepancies are expected
- Study the following: bubble destruction, dynamic range/compression, analog/digital gain
- Difficult quantification parameters to address: PI (peak intensity), AUC (area under the curve)
    - Normalize PI to normal parenchyma?
    - Normalize AUC to PI?

WebEx Calls: **May 4**: SWS BC - TBD **May 11**: CEUS BC **June 1**: SWS BC **June 8**: CEUS BC

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 if their attendance is not reflected on the call summaries.