In attendance

<table>
<thead>
<tr>
<th>Name</th>
<th>In attendance</th>
<th>RSNA</th>
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<tbody>
<tr>
<td>Mike Averkiou, PhD (Co-Chair)</td>
<td>Mike Averkiou</td>
<td>Nancy Obuchowski, PhD</td>
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<td>Todd Erpelding, PhD, MSE (Co-Chair)</td>
<td>Madison Gallagher</td>
<td>Joe Koudelik</td>
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<td>Vinay A. Duddalwar, MD, FRCCR</td>
<td>Nancy Obuchowski, PhD</td>
<td>Thierry Rognard</td>
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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