



AIUM/QIBA Ultrasound Volume Blood Flow Biomarker

Summary 18-July-2022

Attendees: Brian Fowkles, Mark Lockhart, Cristel Baiu, Jonathan Rubin, Jim Zagzebski, Rimon Tadross, Kourosh Kalayeh, Jing Gao, Michelle Robbin, Stephen Pinter, Paul Carson, Nicole Lafata, Megan Russ, Ted Lynch, Oliver Kripfgans

AIUM Staff: Haylea Weiss

1. Review of Previous Call Summary – 06-June-2022

2. Previous Action Items

2.1. Abstracts for Groundwork Studies. Future plans for direct comparison between 3D volume flow and 2D volume flow in the contexts of the AVF for dialysis access. Potential for phantom studies comparing 2D and 3D directly. Megan R. is interested in contributing to groundwork studies but mentioned not having any 3D transducers. This will be a potential limitation for site participation. There is a potential of doing some Round Robin measurements at professional meetings, i.e., RSNA and AIUM. Would need to examine the logistics, recognizing that systems may not be using released software. Brian mentioned building an app in MATLAB and hopes to have that up and running in the near future.

2.1.1. Consider contacting company about their ability and interest in participating in a possible round robin in the future when systems are ready. Currently GE Logiq series systems have data saved in the DICOM sufficient for offline calculation of 3DVBF using MATLAB software mentioned above. The e10 has not been tested in the QIBA phantom. The Voluson e10 has appropriate data storage for 3DVBF but does require some software adjustments based on QIBA phantom testing that was done for an NIH-funded project. The Philips Epiq 7 has been QIBA tested as well but there is special software necessary for access to the data for 3DVBF. So, any consideration of testing at a national meeting would have to consider these factors.

- 2.1.2. A key factor in deciding to conduct such testing is determining what specifically will be gained. This needs to be an effort that would be expected to result in a publishable outcome.
 - 2.2. Brian F.'s new analysis of the results from the Zonnebeld et al. reference. These results are now incorporated into the Profile text. We will need to determine if there is any additional information (appendix) that would need to be provide related to this analysis. Consider whether there might be interest by the authors in an additional related publication.
 - 2.3. Brian to set up groups to divide tasks related to reviewing section 4 in context of the rest of the profile.
3. Update on Phantom Modeling
 - 3.1. Reviewed recent modeling as presented by Kourosh K. Discussed the segments within the phantom that would have parabolic flow for the lower flow rates. Discussed the tube diameter and fluid viscosity changes that might be possible to provide faster restoration of parabolic flow.
 - 3.2. Cristel B. was surprised by the results. He will send pictures of a phantom where he has piping outside, and the bend angle has interesting/unexpected effects on the flow. Less bend was actually worse with a 90 degree bend restoring the profile faster than for 45 degree. Also discussed was the peak velocity in the modeled phantom and whether knowing the peak throughout the length would be ok even if it were not in the middle of the flow.
 - 3.3. Nicole L. noted that the peak velocities tested in US QC were in the range of 60 cm/sec so the lower two mean velocities used in the simulation would result in the parabolic flow with similar peak velocities. So, this phantom design may indeed serve the QIBA and standard Doppler testing purposes.
 - 3.4. Kourosh will examine extracting the peak velocities throughout the tube and its value along the length of the tube.
 - 3.5. It was pointed out that since the tubing diameter is unchanged along the length of the tube, the mean velocity should always be the same regardless of the profile. So, testing the mean velocity calculation by the system can be check for its sensitivity to profile changes throughout the phantom.
4. Update on VBF Profile Discussions
 - 4.1.1. There was no time to consider updates on the profile and those approved by the Profile Task Group.
5. Action Items

Kourosh will examine extracting the peak velocities throughout the tube and its value along the length of the tube.

Next full BC meeting is scheduled for Monday August 1, 2022 at 12:30pm ET.

Next Profile meeting is Wednesday July 27, 2022 at 10:00 am ET.

Information from the Chat Box

So we will have to specify where the measurement should be performed in the phantom for precision/accuracy

Education on the limitations of conventional speed and flow measurements is a large part of this design. Recovery of a lot of understanding achieved in this discussion would be useful in describing to the users the limits of various measures