



AIUM/QIBA
Ultrasound Volume Blood Flow
Biomarker

MINUTES 2016-10-03

Attendance:

K. Akaki , P. Carson , S. Chen, V. Devaraju, D. Dubberstein , T. Erpelding , B. Fowlkes, J. Gao , T. Hall, O. Kripfgans, CY. Lee, R. Leichner, M. Lockhard , T. Lynch, R. Managuli, K. Minton, M. Robbin , J. Rubin, R. Tadross, M. Trew, J. Zagzebski

I. Phantom production

- Review of Phantom layout and structure
- Final specifications in separate document
- Discussion of possibility to increase tubing diameter to 7 mm. Quality of existing results for 5 mm tubing was argued to be encouraging enough to stay at 5 mm.
- Discussion of possibility to decrease specified pump rate to 720 mL/min was accepted due to the disproportional level of complication to produce phantom with larger pump and adequate flow meter. In addition, the current system already experiences onset of cavitation bubbles at largest flow rate. Increase in flow rate beyond 720 mL/min is likely to exacerbate bubble formation.
- The topic of retro-grade flow was discussed as a possibility in the phantom. The committee decided that this would be acceptable. In the same discussion the currently 60 beats per minute pulsatile flow was also deemed as adequate.
- Phantom gel will be soft enough to accommodate displacements due to transducer touching phantom surface.
- In a previous t-con the discussion of possible flow range and depth lead to the question of what PRF may be supported for a given center frequency and depth. A 4D10L GE probe was used on an Logiq 9 system. For 5 cm depth and 5 MHz CF, the max. PRF is 10.1 kHz, i.e. 77 cm/s. A 5 mm flow tube would carry 450 mL/min in straight insonation (no Doppler angle) and 50% baseline (no baseline shift for color bar). For 3.8 MHz CF the max. PRF is 10.1 kHz, i.e. 101 cm/s and the corresponding flow rate would be 600 mL/min straight and 50% baseline.
- Measuring flow rate or velocity in the stenosis for full range of volumetric flow is not required; it is acceptable to be above the Doppler capability for some flow conditions.
- Minimal flow of the pump would be 150 mL/min (10% of 1.5 L/min maximum flow). This was a concern as the brachial artery flow is 30-40 mL/min. Kidney and carotid (385±158 mL/min, Salveteria 1998) would be okay. Volumetric flow is minimal in pulsatile mode.
- The timeline for phantom testing was pushed back to December due to delay in phantom manufacturing.