CONFIDENTIAL

PROTOCOL FOR BRACHIAL ARTERY REACTIVITY STUDIES
Sleep Apnea Study
UW Atherosclerosis Imaging Research Program

*Prior to starting, obtain or create the subject's data folder with ID number.

1. Place patient in supine position for 10 minutes prior to imaging. Make sure room temperature is 70-76°F.
2. Place study videotape (for backup) into ultrasound machine and cue up tape and time counter.
3. Use 8 MHz (or higher) linear array vascular probe for B-mode and Doppler imaging.
4. Log in tape time under VCR controls.
5. Enter pertinent information under "Patient ID" on the first line to create a Camtronics study.
6. Attach ECG leads to chest and automatic blood pressure cuff to left upper arm, set at q.15 minutes.
7. Place small forearm cuff on widest part of proximal right forearm (approximately 1-2 cm distal to the antecubital fossa). The arms used for blood pressure measurement and imaging may be changed *only* under special circumstances. This must be recorded for future studies.
8. Extend arm 80-90° from the thorax (or maximally abducted if limited range of motion) and rest on arm board.
9. Elbow should be positioned down against arm board with hand rotated so thumb points towards the ceiling.
10. Annotate "baseline" on screen.
11. Locate the brachial artery. If necessary, use color Doppler imaging to locate and verify arterial flow.
12. Optimize the image for best resolution of all three layers of the anterior and posterior walls with special emphasis on identifying the media-adventitia interface. Do not use zoom mode.
13. Document probe position on subject's worksheet in regard to:

    a) Distance (cm) from the antecubital fossa
    b) Medial or lateral approach
    c) Angle of the probe in the sagittal plane.
    d) Vessel and focus depth.

14. Annotate an "x" next to an extravascular landmark for future reference and to prevent image drifting.
15. The vessel image should be located in the center of the screen. When optimized, print a hard copy still frame image (at the peak of the R-wave) to document artery and probe location.
16. Record 5 seconds of baseline study onto VCR tape. Acquire and store a R-wave gated still frame of a B-mode image of the brachial artery to Camtronics system.

17. Optimize spectral Doppler images. Place Doppler sample volume in center of vessel with arrow (angle) pointing towards direction of flow (*i.e.*, to the hand) and parallel to the walls. Optimal Doppler angle is 60°.

18. Record 5 seconds of baseline Doppler flow onto VCR tape. Store still frame of optimized Doppler flow signal to Camtronics system.

19. Inflate the forearm pressure cuff to 250 mmHg for 5 minutes.

20. Annotate "RH" (reactive hyperemia) and time of cuff inflation onto screen.

21. At 41/2 minutes, switch from B-mode live imaging to Doppler optimize scale and spectral Doppler signal. Begin VCR tape recording 30 seconds before cuff deflation.

22. Deflate cuff after *exactly* at 5 minutes.

23. Freeze Doppler image and scroll back to initial increased Doppler flows (usually starting approximately 3 beats after cuff deflation) and store still frame to Camtronics system.

24. At 60 seconds after cuff deflation, acquire and store an R-wave gated still frame of a B-mode image of the brachial artery to Camtronics system.

25. At 90 seconds after cuff deflation, acquire and store an R-wave gated still frame of a B-mode image of the brachial artery to Camtronics system.

26. Turn off VCR and remove the subject's ECG leads.