Procedure Name: **Upper Extremity Arterial Doppler**

Updated 11/27/12

Indications:
Pain upon exertion, parathesia, absence of pulse, color changes to fingers and any other indications determined by referring physician.

General Description:
This is a survey to localize and characterize disease of the upper extremity arteries bilaterally.

Patient Preparation:
There is no preparation for this exam.

Equipment Selection and Settings:
Parks Flo-Lab vascular system will be used for WBIs and Doppler waveform.
If duplex scanning is needed, select PV Artery from preset menu on ultrasound imaging unit and use a linear 6.0MHz probe for most patients. The sonographer should use the preprogrammed setting for the appropriate body part and adjust gain, depth and transmit zone settings to optimize images.

Imaging Sequence:

Complete NIPS (Non-Invasive Physiologic Studies) using Parks Flo-lab unit

Apply two cuffs, one to upper arm and one to forearm to obtain WBIs. Measure pressures using brachial and radial or ulnar artery. Recommended cuff bladder size should be 20% wider than limb diameter for accurate pressures.

Obtain systolic pressure in each arm. Use the higher of the two brachial pressures for calculating indices. Do not take a pressure in an arm with a shunt or dialysis access graft.

Select Doppler setting from the menu and obtain Doppler waveforms from at least 3 levels of each arm. Preferable locations are radial/ulnar, brachial and axilla or subclavian artery.

If WBIs are normal (.90-1.3) and all waveforms are triphasic, the exam is over. No other imaging is necessary. If an WBI is abnormal (<.9 or >1.3) or any of the waveforms are biphasic or monophasic, proceed with duplex imaging.

If the Flo-Lab does not send the worksheets directly to pacs, a patient info page must be taken on the ultrasound unit and sent to pacs. This is the last step after completing in IDX and scanning in worksheets.

Duplex Imaging - Bilateral

Scans are obtained in the longitudinal and transverse. Vessels listed below are evaluated for peak systolic velocity and for the presence of a triphasic waveform. Spectral broadening is noted.

Long and transverse grayscale, color doppler and spectral waveform

1. Image patient data (demographics page)
2. Common Carotid Artery (CCA)
3. Subclavian Artery (SCA)
4. Axillary Artery (AA)
5. Brachial Artery (BA) (evaluate brachial artery at proximal, mid and distal to demonstrate area with greatest peak systolic velocity)
6. Ulnar Artery (UA)
7. Radial Artery (RA)

Angle adjusted spectral Doppler evaluation: All spectral waveforms must be angle corrected. The angle is to be 60 degrees or less and the gate adjusted to half the size of the vessel utilizing color flow. If significant stenosis is visualized, Doppler spectrum analysis should be imaged proximal, at and distal to each stenosis. Take additional grayscale and color images deemed necessary to document disease. If color flow images demonstrate a high velocity variance (color reaches the extreme level at either end of the spectrum usually either yellow white or green) then drop an angle adjusted spectral Doppler for velocity measurement at the peak of the turbulence.

Print (or send to pacs) worksheets from Flo-Lab unit with WBI and waveforms from all levels documented on worksheet. If NIPS exam was abnormal and duplex imaging was performed, document findings on Flo-Lab worksheet to be scanned in or sent directly to PACS.

When completing the exam in IDX, the code MUST be updated to reflect the correct code for the exam that was performed. This MUST be done before sending images (or worksheets) to pacs.