

Research Echo/Vascular Lab PWV Protocol

EQUIPMENT

SphygmoCor System (applanation tonometer), ECG electrodes & cables
Vascular Lab laptop computer & AC adapter
Blood pressure machine
Tape measure/callipers

Pulse Wave Velocity (PWV)

Ensure area is quiet and temperature is stable
Have patient lie down in comfortable position
Obtain Blood Pressure
Attach ECG leads **ensuring R wave is upright**

Carotid Pulse

- Find strongest pulse at carotid artery
- Best to have patients head flat, or slightly extended
- Mark the spot with washable marker
- Measure distance from supra sternal notch to carotid using tape measure (this measurement in mm will be used as proximal distance)

Femoral Pulse

- Find strongest pulse at femoral artery just below inguinal ligament in groin
- Placing a roll under hips may bring artery closer to surface
- Mark the spot with washable marker
- Measure distance from SSN to femoral artery using tape measure or callipers (this measurement in mm will be used as distal distance)

Radial Pulse

- Find strongest pulse at radial artery
- Placing a roll under wrist may bring artery closer to surface
- Mark the spot with washable marker
- Measure distance from SSN to radial artery using tape measure or callipers (this measurement in mm will be used as distal distance)

Acquisition

- Select PWV from right of screen
- Enter BP and previously recorded distances in Distal and Proximal boxes
- Site A should be set to Carotid and site B should be Femoral or Radial
- Time (capture time) should be 10 seconds
- PWV algorithm should be Intersecting tangents
- When ready to acquire click on Capture data (**ensure ECG R wave is upright**)
- Look for a steady vertical waveform with consistent pulse height
- Pay particular attention to the foot of the wave
- 2 complete screens of consistent waveforms are required
- Waveform signal strength should be **NO LESS THAN 100** (usually 300 to 500 can be achieved)

- Hit spacebar when site A acquisition is complete and then hit yes button to continue to site B
- Hit spacebar when distal artery acquisition is complete

Quality Check

- The system requires a minimum of 3 pairs of green dots otherwise PWV will not be calculated
- ECG-CAR and ECG-FEM should be **GREEN not RED**, this means that the SD is <6%
- PTT SD should be GREEN meaning that the PWV SD <10%
- Difference in HR should be <5bpm which may be a challenge in younger children.
- If all data is acceptable study can be concluded.

Tips

- If there is waveform baseline or pulse height variation, this is likely due to inconsistent hold-down pressure
- Messy signal likely due to tonometer not directly on artery, try to re=position or alter angle of transducer