Lower Extremity
Venous Duplex Protocols
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- Verify patient, physician order and proper indication for examination.
- Explain test procedure to patient in order to minimize anxiety.
- A focused history and physical examination should be performed. CEAP Classification should be noted.
- If necessary, the calf and ankle circumference measurements should be obtained bilaterally and recorded on the patient record.
- Depending upon the indication for the exam, (Obstruction vs. Insufficiency) the focus of the exam will be fundamentally different.
  - A venous insufficiency exam includes a cursory evaluation of the deep system with focus on anatomic variables, documenting reflux and the sourcing of the reflux.
  - For obstruction, only a cursory assessment of the superficial system and/or valvular competency is performed.
- Selection of the optimal transducer and frequency per patient presentations.
- If the findings suggest an extension of the exam to include additional vessels, eg. abdominal or pelvic vessels not explicit in the original order, (or the contralateral limb if a unilateral exam was ordered) clearance with the referring physician should be obtained.

Obstruction - examine in standing, supine / reverse Trendelenberg position

- Externally rotated with support for the knee as necessary. The common femoral ("CFV"), profunda femoris ("DFV"), and femoral vein ("FV"), posterior tibial ("PTV"), and sometimes peroneal veins ("PerV") can be examined in this position as well as the great saphenous vein ("GSV") as necessary. To visualize the distal FV, popliteal ("PopV"), tibioperoneal trunk and PerV, turn the patient on their side away from the leg being examined (Rt leg > Lt lateral, Lt leg > rt lateral) and provide support for the knee. The small saphenous vein ("SV"), soleal, and gastrocnemius veins can be imaged from this approach if indicated.
- The vessels should be visualized in both longitudinal and transverse planes.
  - Longitudinal plane - Observe color Doppler for spontaneity, phasicity, augmentation upon distal compression and release, and presence or absence of reflux with /without proximal and distal augmentation maneuvers. Document CFV, PFV, FV, PopV, and calf veins as necessary or indicated by findings with spectral analysis.
  - Transverse view - check for compressibility by applying manual pressure with the transducer. The vessel walls must coapt completely. Begin with the CFV compressing at 1-2 cm intervals throughout all deep and superficial veins. Be alert for anatomic variants and document as necessary.
- At a minimum, evaluate the common femoral confluence of the contralateral limb to assess outflow for comparison if feasible given the patient and findings.
**Venous insufficiency** - performed with the patient standing (if unable, document reason in the record.

**Initial Venous Examination**

- Perform exam of deep and superficial veins for obstruction as described above
- Valsalva, distal compression, Parana, or other augmentation maneuvers are employed in documenting the presence or absence of reflux.
- Doppler spectral analysis allows for quantitative assessment of reflux documenting duration and amplitude, notation of reflux at junction, axial or segmental, specific locations, and perforating veins and anomalies as necessary.
- Measurements of the GSV, SSV, anterior accessory great saphenous vein ("AAGSV"), posterior accessory great saphenous vein ("PAGSV"), and any anatomic variants are obtained at specified locations.
- Source reflux for any additional varices noted on physical examination if not previously identified.

**Follow-up venous treatment** - performed with the patient supine, typically 2-7 days post op

- Perform exam of deep and superficial veins for obstruction as described above
- Use of distal compression maneuvers may be employed to document patency and/or lack of obstruction
- Special attention to the treated vein is question, particularly at its junction with the deep system
- Document occlusion and segment (i.e.: length of ablated vein)

**Venous Obstruction Required Documentation**

**Gray scale Images**

Transverse view - by convention, compressed image will be on the right side of the side image unless noted

1. Common femoral
2. Profunda femoris
3. Femoral vein proximal
4. Femoral vein mid
5. Femoral vein distal
6. Popliteal vein
7. Posterior tibial veins
8. Peroneal veins
9. Great saphenous vein
10. Small saphenous vein
11. Other calf veins as necessary
12. Any area of suspected obstruction

**Doppler (color – spectral)** - Flow characteristics

11. Common femoral vein (note respiratory phasicity)
12. profunda femoris
13. Distal CFV / proximal FV – inspiration / distal compression w/ release
14. Femoral vein mid
15. Popliteal – distal compression w/ release
16. Demonstration of flow in Posterior tibial and Peroneal veins (spectral or color, best available data)
Venous Insufficiency Required Documentation

Gray scale Images
Transverse view - by convention, compressed image will be on the right side of the side image unless noted
1. Common femoral
2. Mid / distal FV
3. Popliteal – compression
4. Posterior tibial veins
5. Peroneal veins
6. Great saphenous vein
7. Small Saphenous vein
8. Accessory Saphenous veins

Measurements -

Great Saphenous Vein
1. SFJ / proximal thigh
2. Mid thigh
3. Knee
4. Mid calf
5. Ankle (if necessary)

Small Saphenous Vein - document termination*
1. Thigh
2. Proximal
3. Mid
4. Distal

Anterior Accessory Great Saphenous Vein - also report non tortuous length
Posterior Accessory Great Saphenous Vein - also report non tortuous length
Perforating veins
as applicable

Doppler (color – spectral) - with the patient standing
1. Common femoral
2. Profunda femoris vein
3. Distal common femoral / proximal femoral vein
4. Femoral vein mid-distal
5. Popliteal vein – distal compression w/ release
6. Saphenofemoral junction - terminal valve
7. Saphenofemoral junction- pre-terminal valve
8. Great saphenous vein mid thigh
9. Great saphenous vein knee
10. Great saphenous vein mid-distal calf
11. Small saphenous vein
12. Anterior accessory great saphenous vein
13. Any other location where reflux is noted