



Sonographer Scanning Cheat Sheet:

NEW—Lower Extremity Venous Duplex US

Procedure Overview: A lower extremity venous duplex ultrasound assessment is performed to detect the presence, severity, and location of venous disease in the lower extremities.

Required Pre-Procedure Prep:

- Obtain patient verbal consent.
- Obtain patient history, current medications, and previous vascular surgery.
- If the patient is having limb pain ask location, when pain occurs, and what relieves the pain.
- Complete a physical exam. Assess the extremities for trophic changes, lesions, color, and temperature.
- Instruct the patient to remove all clothing from the waist down except undergarments. Orient patient to a reverse Trendelenburg position.

Proper Probe: Linear array probe with a frequency of 6 - 12 MHz that has tri-duplex capabilities.

Protocol for Lower Extremity Venous Duplex Ultrasound Bilateral (93970) Unilateral (93971)

*This protocol aligns with the Mindray iWorks protocol: **Imagen Lower Venous***

You may “Suspend” the protocol at any time to take additional images or handle pathology, then restart iWorks.

Proper imaging of LEV vessels:

Compression - Venous compression is applied every 2 cm or less in TRV with adequate pressure to completely collapse the vein. ***You must compress the entire vessel length to rule out DVT!!***

Greyscale TRV - Vessels should be round, not oblique, and centered on screen.

Greyscale Sag - Vessel should be perpendicular to probe and straight across the screen to best visualize intimal wall layer.

Color Box - Should always be taller than wide. Straight for TRV. Steered appropriately for Sag.

Sag PW - No angle correct required as flow velocities are not assessed. Wider sample size gate should be used with venous flow documented below the baseline.

Thrombosis - Document vessel(s) involved, extent of clot, if occlusive or non-occlusive, and if acute or chronic.

Acute - Hypoechoic, vessel may be dilated, may be partially compressible (Spongy).

Chronic - Hyperechoic, firmly attached to the wall, incompressible, or echogenic linear bands (webbing)

- For superficial venous thrombus, document thrombus length and distance from the saphenofemoral or
 - Thrombus within 3 cm of the junction should be reported (Classified as DVT)
 - Thrombus length >5 cm should be reported due to management implications.

Spectral Doppler - All studies, unilateral or bilateral, should include right and left CFV spectral Doppler waveforms. Recordings should evaluate for asymmetry and/or loss of respiratory phasicity.

Augmentation - Routine spectral Doppler distal augmentation is not necessary to diagnose DVT.

Anomalies - Note should be made of venous anomalies such as duplicate veins with a representative TRV Dual screen compression image and Sag w/Color - may be demonstrated separately or together with corresponding vein(s).



If Bilateral, Begin Exam with Right Side:

If Unilateral, Begin Exam with Contralateral Side and Do the CFV Sag/TRV images only for opposite side :

1. TRV CFV Dual screen w/Compression (label appropriately Lt or Rt, if not using iWorks)
2. Sag CFV
3. Sag CFV w/Color
4. Sag CFV w/Color and PW (make sure FLOW is represented accurately as phasic or continuous)
5. TRV CFV/GSV Junction Dual screen w/Compression
6. Sag CFV/GSV Junction
7. Sag CFV/GSV Junction w/Color
8. Sag CFV/GSV Junction w/Color and PW of the Prox GSV
9. TRV Profunda V Dual screen w/Compression
10. Sag Profunda V
11. Sag Profunda V w/Color
12. Sag Profunda V Prox w/Color and PW
13. Fem V Prox Dual screen w/Compression
14. Sag Fem V Prox
15. Fem V Prox w/Color
16. Sag Fem V Prox w/Color and PW
17. TRV FV Mid Dual screen w/Compression
18. Sag FV Mid
19. Sag FV Mid w/Color
20. Sag FV Mid w/Color and PW
21. TRV FV Distal Dual screen w/Compression
22. Sag FV Distal
23. Sag FV Distal w/Color
24. Sag FV Distal w/Color and PW
25. TRV Pop V Prox Dual screen w/Compression
26. Sag Pop V Prox
27. Sag Pop V Prox w/Color
28. Sag Pop V Prox w/Color and PW
29. TRV Pop V Distal Dual screen w/Compression
30. Sag Pop V Distal
31. Sag Pop V Distal w/Color
32. Sag Pop V Distal w/Color and PW
33. TRV PTV Distal Dual screen w/Compression
34. Sag PTV
35. Sag PTV w/Color
36. TRV Peroneal V Dual screen w/Compression
37. Sag Peroneal V
38. Sag Peroneal V w/Color
39. Additional images at focal symptomatic area(s) as directed by the patient or provider. If thrombosis is seen in a vessel outside standard protocol, document the location and extent of clot in TRV Dual screen w/Compression and in Sag w/Color.

****Repeat for Left side if Bilateral****

Common Pathologies

- Deep Vein Thrombosis (DVT): Presents as a partial or completely occluding internal venous lesion with internal echoes. Differentiate between an acute and chronic thrombus formation documenting the location, extent of the thrombus, and the echogenicity (if possible).
 - Acute Thrombus: Typically appears hypoechoic, partial compressibility, painful, and without collateral veins.
 - Chronic Thrombus: Typically appears hyperechoic, minimal pain, incompressibility, and with collateral veins.
 - Varicose Veins: Presents as dilated, superficial veins measuring >2 mm. These veins bulge above the skin surface and typically appear blue to purple in color. Document the origin of the vein and internal flow.
 - Venous Insufficiency: Presents as an incompetent venous valve. Document reflux time with the patient standing to increase hydrostatic pressure with proximal or distal augmentation. Reflux time >500 ms is consistent with venous insufficiency.

DEMONSTRATION of ACCURATE FLOW PATTERN is Imperative, especially when not performing Augmentations. *Normal Venous Flow should be bidirectional or PHASIC.* Having your vessel angled and not straight across the screen can help to show PHASIC Flow as well as having the patient take in deep breaths IN and OUT. If you see CONTINUOUS or Reduced flow, FIND THE Level of OBSTRUCTION!

