

Vascular Ultrasound Protocol: Lower Extremity Venous for DVT

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Last Review Date: [Link to Last Review Date Table](#)

List of Required Images

Lower Extremity Bilateral, Right, or Left

- **Transverse:** Dual side-by-side grayscale images should be recorded without and with compression at each of the following levels
 - Common femoral vein
 - Junction of the common femoral vein with the great saphenous vein
 - Proximal deep femoral vein
 - Proximal femoral vein (can be on same image as proximal DVF or separate)
 - Mid femoral vein
 - Distal femoral vein
 - Popliteal vein
 - Peroneal vein
 - Posterior tibial vein
 - GSV prox
 - SSV prox
 - Contralateral common femoral vein
- **Sagittal images with and without color Doppler**
 - Common femoral vein
 - Junction of the common femoral vein with the great saphenous vein
 - Proximal deep femoral vein
 - Proximal femoral vein (can be on the same image as the proximal DFV or separate)
 - Mid femoral vein
 - Distal femoral vein
 - Popliteal vein
 - Peroneal vein
 - Posterior tibial vein
 - GSV prox
 - SSV prox
- **Sagittal spectral Doppler images**
 - Contralateral Common femoral vein
 - Ipsilateral common femoral vein
 - Saphenofemoral junction
 - Femoral vein mid
 - Popliteal vein

For general pathology, use the [Pathology Protocol](#).

Additional Images for Anatomy and Vascular-Specific Pathology

- For focal symptoms of the calf, evaluate the gastrocnemius veins.
- Additional images documenting thrombus.
 - Show thrombus in transverse with compression using gray-scale
 - Show thrombus in longitudinal plane showing echogenicity and extent of thrombus
 - Show thrombus in longitudinal using color Doppler to demonstrate complete vs. partial occlusion and with spectral Doppler above, in, and below the thrombus.
- If thrombus extends centrally into the pelvis, evaluate the common iliacs, external iliacs, and IVC.
- If continuous flow with flat waveform is observed on the symptomatic side, evaluate the external iliac vein, common iliac vein, and IVC.
- For superficial vein thrombus, document the distance between the thrombus and the junction with the deep vein. Less than or greater than 5 cm is the critical distance.
- Document anatomical variations, such as duplications.

Guidelines for Lower Extremity Venous Duplex Evaluation

- “Proximal” and “distal” refer to the relative distance from the attached end of the limb per Gray’s Anatomy. For example, the proximal femoral vein is closer to the hip and the distal femoral vein is closer to the knee.
- Compression ultrasound:
 - Performed using gray scale.
 - Venous compression is applied in the transverse plane with adequate pressure on the skin to completely obliterate the normal vein lumen.
 - Compressions should be performed in real time every 1-2 cm along the entirety of the vessels, with note made of any section greater than 2 cm where compression is technically limited or could not be directly visualized.
 - If compression is difficult to demonstrate clearly on still images, consider either placing arrow or calipers at the site of the compressed vessel or recording a cine demonstrating the compression.
- For Spectral Doppler, set the scale so that the waveform fills approximately 75% of the box.

Common Indications for Lower Extremity Venous Duplex

Evaluation of possible venous thromboembolic disease or venous obstruction in symptomatic or high-risk asymptomatic individual • Follow-up for patients with known venous thrombosis near the anticipated end of anticoagulation to determine if residual venous thrombosis is present • Evaluation of veins prior to venous access