

Vascular Ultrasound Protocol: Upper Extremity Venous for DVT

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

List of Required Images

Upper Extremity: Bilateral, Right, or Left

- **Transverse:** Dual side-by-side grayscale images without and with compression at each of these levels
 - Internal Jugular vein
 - Subclavian vein, if possible
 - Axillary vein
 - Brachial veins: Proximal, Mid, and Distal
 - Cephalic vein in the upper arm: Proximal, Mid, and Distal
 - Basilic vein in the upper arm: Prox, Mid, and Distal
- **Sagittal images with and without color Doppler**
 - Bilateral Internal Jugular veins
 - Bilateral Subclavian veins
 - Axillary vein
 - Mid Brachial veins
 - Mid Cephalic vein
 - Mid Basilic vein
- **Sagittal spectral Doppler images**
 - Bilateral Internal Jugular veins
 - Bilateral Subclavian veins
 - Axillary vein
 - Mid Brachial veins
 - Mid Cephalic vein
 - Mid Basilic vein

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

Additional images for Anatomy and Vascular-Specific Pathology

- Symptomatic areas, such as the forearm, may require additional evaluation.
 - If the patient has focal symptoms in the forearm, complete evaluation of the basilic and cephalic veins should be performed to the wrist. In addition, perform evaluation of the area of focal symptoms, including of the radial and ulnar veins if appropriate.
- 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 proximal to, within, and distal to the thrombus.
- Document anatomical variations, such as venous duplication.
- Other vascular and nonvascular abnormalities, if found, should be documented per the Pathology Protocol, but may require additional imaging for diagnosis or further characterization.

Guidelines for Upper Extremity Venous Evaluation for DVT

- Upper extremity venous duplex evaluation consists of grayscale and Doppler assessment of all the accessible portions of the internal jugular, subclavian, axillary, and brachial veins, as well as compression grayscale ultrasound of the basilic and cephalic veins in the upper arm to the elbow.
- Compression ultrasound:
 - Perform using gray scale.
 - Compress in the transverse plane with adequate pressure on the skin to completely obliterate the normal vein lumen.
 - Perform in real time every 1-2 cm along the entirety of the vessels. Make note 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.
- Spectral Doppler in the long axis for evaluation of asymmetry or loss of cardiovascular pulsatility and respiratory phasicity.

Common Indications for Upper Extremity Venous Duplex

• Swelling • Pain • Tenderness • Symptoms of PE, SOB with known lower extremity DVT • 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