

ARM VEIN MAPPING US PROTOCOL

PURPOSE:

- To evaluate the patency, size, condition (such as calcification or thickening), and the course of superficial veins for surgical planning prior to vein harvesting or AV fistula creation.

EQUIPMENT:

- 5-7 MHz linear probe

PATIENT PREPARATION & ASSESSMENT:

- Introduce yourself to the patient.
- Verify patient identity via two patient identifiers (name and date of birth) per hospital policy.
- Explain the examination, its purpose and how long it will take.
- Answer any questions the patient may have regarding the examination.
- Obtain patient history including symptoms, signs, risk factors and other relevant history.

GENERAL GUIDELINES:

- The extent and location of sites where the veins fail to compress completely should be clearly recorded and generally require additional images. Longitudinal views without compression may be helpful to characterize the abnormal vein.
- For focal lesions (masses, lymph nodes, cysts) obtain split-screen images of the lesion without calibers, with calibers and with Color Doppler.
- Any deviations from the standard protocol and any limitations to the examination should be documented on the technologist worksheet for future reference and for repeatability in follow-up studies.
- Report preliminary critical findings to the referring clinician when appropriate (i.e. immediate medical attention may be warranted) and according to hospital policy.
- Arm preference for AVFs is nondominate arm over dominate arm and forearm over upper arm
- Order preference for AVF site is radial artery to cephalic vein, brachial artery to cephalic vein, brachial artery to basilic vein and brachial artery to brachial vein.
- Then move to PTFE grafts in order brachial artery to antecubital vein, brachial artery to basilic vein and axillary artery to axillary vein.
- Then move to thigh PTFE grafts femoral artery to great saphenous vein or common femoral vein.

DOCUMENTATION:

DVT Evaluation

- Assess veins for compressibility every 2 cm of their length.
- Document transverse split-screen images without and with compression and transverse color flow images in the following segments:
 - Internal jugular vein

- Subclavian vein
- Axillary vein
- Brachial veins
- Measure the AP diameters of the axillary and brachial veins in the upper arm.
- If thrombus is noted in any of the above veins, proceed with documentation of longitudinal images with color flow followed by spectral waveforms of the deep veins.
- Do not perform augmentation if thrombus is noted.

Cephalic Vein then Basilic Vein

- Venous distention achieved by use of sequential tourniquet or inflated blood pressure cuff on the arm.
- Assess vein for compressibility every 2 cm of their length.
- Vein diameter must be ≥ 2.5 mm for fistulas and ≥ 4.0 mm for grafts.
- Document transverse split-screen images without and with compression followed by measurement of AP diameter of the vessel in the following segments:
 - Upper arm proximal
 - Upper arm distal
 - Forearm proximal
 - Forearm distal

Radial and Ulnar Arteries

- Artery diameter must be ≥ 2.0 mm for fistulas and grafts.
- Document transverse split-screen grayscale images without and with inner lumen AP diameter measurement.
- Document longitudinal color and spectral Doppler images with PSV measurements of the following:
 - Radial artery at the wrist
 - Ulnar artery at the wrist
- Assess for the presence of a high brachial artery bifurcations (10% patients).
- Note presence and degree of vessel calcifications.