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**Sample Protocol for Performing Lower Extremity Reflux Examinations for Venous Insufficiency**

**Purpose**: Peripheral venous reflux examinations are performed to assess the deep and superficial venous system for patency and competency.

**INDICATIONS:**

Common indications:

* Swelling
* Pain
* Ulcer
* Discoloration
* Visible veins

**CONTRAINDICATIONS:**

* Patients with casts, bandages
* Patients who are unable to cooperate due to mental status changes or involuntary movements
* Patients with severe edema

**EQUIPMENT:**

* Duplex ultrasound with color flow Doppler with transducer frequencies ranging from 4 -9 MHz

**PATIENT PREPARATION:**

* Introduce yourself to patient
* Verify patient identity according to hospital procedure
* Explain the test
* Obtain patient history including symptoms
* Place the patient in a standing, sitting or reverse Trendelenburg position

**GENERAL GUIDELINES:**

* A complete examination includes evaluation of the entire course of the accessible portions of each vein
* Bilateral testing will be performed unless the patient has unilateral symptoms
* Limited examinations for recurring indications may be performed as noted
* Variations in technique and documentation for assessment of peripheral vascular interventions must be described.

**TECHNIQUE:**

* Equipment gain and display settings will be optimized while imaging vessels with respect to depth, dynamic range and focal zones
* Spectral Doppler waveform assessment will be done in long axis and will be displayed below the baseline
* Spectral Doppler waveform will be assessed for retrograde flow and measured with calipers on the spectral Doppler waveform.
* Transverse grayscale imaging will be performed with and without transducer compressions
* Diameter measurements will be obtained in transverse plane
* The entire length of the veins will be evaluated

**DOCUMENTATION:**

* Transverse grayscale images with and without compression must be obtained from:
  + Common femoral vein
  + Saphenofemoral junction
  + Proximal femoral vein
  + Mid femoral vein
  + Distal femoral vein
  + Great saphenous vein
  + Popliteal vein
  + Small saphenous vein
* Spectral Doppler waveforms must be obtained from:
  + Common femoral vein
  + Saphenofemoral junction
  + Great saphenous vein at proximal thigh
  + Great saphenous vein at knee
  + Great saphenous vein below knee
  + Femoral vein at mid thigh
  + Popliteal vein
  + Anterior accessory saphenous vein (when identified)
  + Small saphenous vein at the junction of the deep system (when visualized)
  + Small saphenous vein at mid calf
  + Perforator vein waveforms with active or healed ulcer, as required by the protocol
  + Additional waveforms as required by the protocol
* Transverse grayscale diameter measurements must be obtained from:
  + Saphenofemoral junction
  + Great saphenous vein at proximal thigh
  + Great saphenous vein at knee
  + Anterior accessory saphenous vein (when identified)
  + Small saphenous vein (at saphenopopliteal junction, if visualized)) If not visualized there, the small saphenous vein at the mid calf must be documented.

**PROCESSING:**

* Review examination data and process for final interpretation
* Note study limitations