

Lower limb Arterial Duplex Protocol

REFERRAL SOURCES

- One-stop clinics
- HOT clinics
- Podiatry
- Leg ulcer clinics
- Inpatients
- Claudicant clinic
- Other hospital consultants

GP's can refer patients for an arterial scan, but these are triaged and can then go on to be seen in claudicant, leg ulcer, one-stop and HOT clinics.

CLINICAL INDICATIONS

- Claudication
- Ischaemic rest pain
- Ulceration/necrosis/gangrene
- Embolic events
- Popliteal aneurysms
- Popliteal entrapment
- False aneurysms
- Post-surgical intervention e.g. angioplasty, thrombectomy, endarterectomy etc.

EXAMINATION

The extent of the examination is at the discretion of the sonographer. Limitations and contraindications may sometimes prevent a full examination e.g. significant pain/distress, casts, open wounds, obesity etc.

Examination can be unilateral or bilateral, dependant on clinical symptoms.

Vessels should be examined in B-mode to assess for aneurysmal dilation and vessel pathology e.g. atheromatous plaque. Colour doppler and spectral Doppler should be used to determine direction of flow, presence of turbulent or stenotic flow and absence of flow.

Any areas of disturbed flow should always be interrogated with pulsed Doppler. The highest peak systolic velocity should be measured at the site of the disturbance or narrowing (V_s) and in a normal area of the artery just proximal to the narrowing (V_p). Care should be taken to ensure that the Doppler angle is 60° or less when recording velocity measurements.

Focussed assessments may be requested by clinicians, otherwise evaluation of the following arteries should be included:

- Common femoral artery (CFA)
- Superficial femoral artery (SFA)

- Proximal profunda femoris artery (PFA)
- Popliteal artery
- Tibio-peroneal trunk (TPT)
- Distal anterior tibial artery (ATA) and distal Posterior tibial artery (PTA)
- Distal peroneal artery if PTA not detected.

Examine and image CFA in B-mode to demonstrate access for angiography if needed. If stenosis is identified, the contralateral CFA should also be examined for angiography access.

The examination should be extended to include the iliac vessels and aorta if monophasic or damped monophasic waveforms are demonstrated in the CFA or if an embolic event is suspected. It may also be necessary to examine aorto-iliac vessels if no evidence of stenosis is found distally, but symptoms are felt to be significant (e.g. where there is a drop in ABPI on exercise).

Ankle brachial pressure index (ABPI) can be recorded as a baseline, where there are no contraindications.

IMAGES

Minimum images to be taken:

- Images of at least the origin of each vessel, including colour doppler and spectral waveforms.
- Images of any pathology, including spectral waveforms demonstrating degree of stenosis if applicable (including documentation of Vs and Vp).
- Distal PTA and ATA, including waveforms.

REPORTING

The reporting should include:

- Correct patient demographics, date of examination, examination type, name and status of the CVS or Sonographer.
- Which arteries have been assessed, commenting on waveforms and the presence/absence of flow.
- The anatomical position and length of any occlusions, stenoses or minor disease.
- Degree of stenosis, graded using the ratio criteria below. For significant stenoses, the velocities should be recorded on the report.
- If there is an occlusion (of the proximal SFA especially), note whether this is flush or whether there is a stump of patent vessel remaining.
- The anatomical position and size of any aneurysms
- Any limitations e.g. difficult examination due to body habitus, calcification causing acoustic shadowing.
- An appropriate number of annotated images that represent the entire ultrasound examination.

repeat the scan in the weight-bearing standing position with force exerted through the leg. Cine loops may be useful to capture the dynamic changes. Always test both legs.

REFERENCES

Society for Vascular Ultrasound Vascular Technology Professional Performance Guidelines
Arterial Duplex Ultrasound Examination 2021 www.svunet.org

Society for Vascular Technology Professional Standards Committee Image Storage
Guideline April 2012 www.svtgbi.org.uk