



## Image Protocol – PACS

### Change History:

Version Number	Reason for Change	CRN	Effective Date
01	New Issue	n/a	05/04/2013
02	Additional protocols	103	06/03/2014
03	Addition of vein map protocol	134	17/12/2015
04	Protocol amendments	161	16/06/2016
05	Change order of modality protocol	193	05/10/2017
06	Addition of UHSM AAA/EVAR protocol	194	20/10/2017
07	Alter popliteal vein protocol	209	23/01/2018
08	Amend upper limb DVT protocol	255	12/11/2019
09	AAA amendment	263	06/02/2020
10	AVP removal	292	26/01/2023
11	GCA addition	304	01/02/2023
12	GCA measurement	339	28/04/2023
13	Removal of 5 sec cine loop at UHSM	383	31/01/2024
14	Scope to save images addition, probe orientation standardisation, removal of DIEP	410	04/03/2024

Prepared By	Date	Approved by	Date
T.Gall	05/04/2013	IVS Board	05/04/2013



**Image recording protocol for Picture Archive and Communication system (PACS)**

Guidance from the Royal College of Radiologists in 2011 (1,2) state that recorded images form part of the patient record, together with the written report of the investigation. They therefore need to be stored and treated as patient record documents.

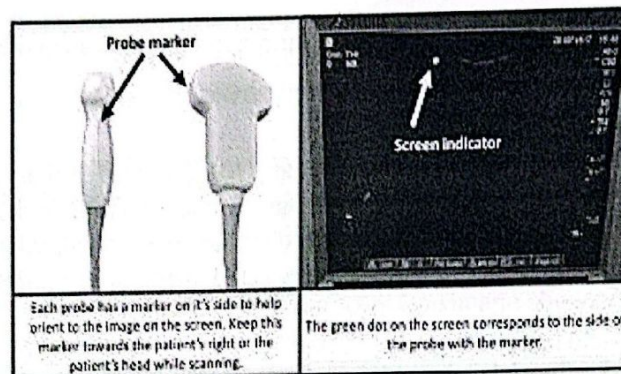
Ultrasound is a dynamic imaging modality and recording and storing of images are vital part of the process to diagnose disease or exclude disease and to produce a written report. The scope and purpose of recording and saving images to PACS is multifactorial:

1. They are a record of findings showing disease and measurements taken and adherence to scanning protocol, as well as demonstrating normality.
2. They support report writing and should back up and verify the written report.
3. They allow for review in a training situation and in follow-up patients undergoing surveillance.
4. They provide quality assurance.
5. They provide evidence that the examination was carried out to a competent standard.
6. They provide evidence that companywide, local and site-specific protocols were followed.
7. They may be used in teaching, reporting unusual cases and audit.

**Probe orientation standardisation:**

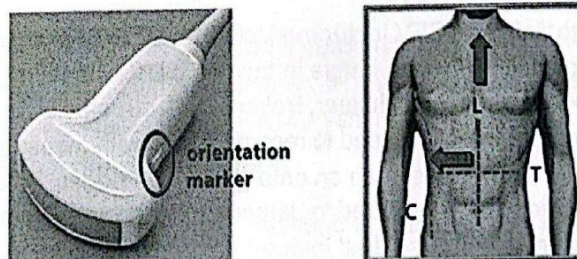


A standardised orientation is used when producing and storing images so that anyone reviewing the images can identify the view. Most probes have a notch. The notch represents the same side as the dot located on the ultrasound screen. It is good practice to identify this (sometimes tapping on the probe is valuable to confirm setting) prior to scanning to ensure the correct orientation if gained.



Standard orientation always has the notch on the probe to either:

- The patient's head for all longitudinal scans
- To the patient's right when scanning the abdomen
- To the patient's center for transverse scans when scanning the neck, lower and upper limbs



The orientation marker should be pointed:

- To the patients right side of the patient for a transverse scan
- To the patients head for a longitudinal scan

Source: Manoj K. Karmakar, Edmund Soh, Victor Chee, Kenneth Sheah:  
*Atlas of Sonoanatomy for Regional Anesthesia and Pain Medicine*  
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### Image acquisition protocol:

Document control - R.Pole  
Version 14 - 04/03/2024. Review date - 04/03/2025





All images must be labelled with anatomy and orientation (LS view, TS/AP view).

Ensure all patient data is entered as appropriate.

This list is not exhaustive, it is a minimum requirement. Other images can be captured at the users discretion especially if abnormal/ unusual pathology is noted.

All standard images should be recorded and appropriately labelled with minimum number of images as below:

**1. Carotid –**

- a. Right/Left side - CCA, ECA and ICA (bifurcation if diseased) demonstrating colour and waveforms. Vertebral and subclavian arteries demonstrating flow direction in vertebral, colour and waveforms. High quality grey scale image of ICA and bifurcation.

**2. TCD – no images taken**

**3. Peripheral Arterial and waveform assessment – Right and left CFA, POP, PTA and ATA waveforms.**

**4. Lower limb arterial – CFA, PFA, SFA origin, mid and distal unless diseased and then demonstrate stenosis with waveforms. Popliteal and TPT. Waveforms at ankle from PTA, ATA and PerA if visualised.**

**5. Lower limb venous DVT-**

- a. Right/left leg - CFV including Valsalva, PFV, SFV origin and distal, Popliteal. Only take image in the calf if DVT identified or differential diagnosis e.g. Muscle tear, Baker's cyst, superficial oedema or thrombo-phlebitis. Need to record images with measurements of abnormal masses such as enlarged lymph nodes, Bakers cysts, muscle tears. If required to demonstrate occlusive vein or compressibility use dual image function to show venous compression.

**6. Lower limb venous Varicose vein –**

- a. Right and left legs
  - i. Follow deep venous protocol as above
  - ii. Superficial junctions demonstrating competence/incompetence
  - iii. Sections of LSV in thigh and calf demonstrating competence/incompetence and TS images showing diameters for VNUS suitability if required





- iv. Section of SSV in mid calf demonstrating competence/incompetence and TS images showing diameters for VNUS suitability if required

**7. Vein mapping for bypass conduit:**

- a. For LSV -  
If suitable vein: One image showing CFV/SFJ and competency. B-mode TS images of proximal, mid and distal thigh with diameter measurement. Proximal, mid and distal calf with diameters.
- b. If Unsuitable vein: one image showing reason for non-suitability eg. Varicose, superficial thrombo-phlebitis.
- c. For SSV-  
If suitable vein and patent junction: One image showing PopV/SPJ and competency. B-mode TS images of proximal, mid and distal calf with diameter measurement.

**8. Transvaginal Duplex Ultrasound for pelvic vein reflux –**

- a. Bilateral internal iliac vein (IIV) and bilateral ovarian vein (OV) in sagittal view. Annotate images to include: vessel diameter, reflux time during/release of Valsalva. Annotate scan position (supine/ semi-standing). If post-embolisation annotate images showing coils in situ.

9. **Aorto-iliac** – aorta in LS and TS demonstrating normal or aneurysmal pathology. Aortic bifurcation and CIA and EIA where possible with colour and waveforms. CEUS and 3D – aneurysm in LS, TS demonstrating sac, endoleak

A tortuous Abdominal Aorta can lead to measurement errors depending on the angle of the Abdominal Aorta and caliper placement. Oblique measurements of the Abdominal Aorta may cause overestimation of the diameter.

Care should be taken when measuring the Aorta to ensure that the diameter is not taken at an oblique angle as per IVS training. The probe should be adjusted by the Vascular Scientist to ensure the maximum diameter of the Aorta is taken perpendicular to blood flow. Vascular Scientists can 'heel -toe' the probe to a more accurate angle to ensure the true AP measurement is achieved. The entire length of the Abdominal Aorta should also be scanned to



identify any vessel tortuosity or the presence of fusiform or saccular aneurysms.

**10. Visceral assessment –**

- a. Proximal abdominal aorta LS with waveform demonstrating any disease.
- b. Coeliac axis (where possible) with colour. demonstrating any disease
- c. Hepatic and splenic arteries – colourflow and spectral waveforms demonstrating any disease
- d. SMA- Colour image and with spectral waveform, SMA diameter, demonstrating any disease
- e. IMA – if identified, colour image and spectral waveforms, demonstrating any disease

**11. Upper limb arterial –** VA direction, subclavian, axillary, brachial, brachial bifurcation, radial and ulnar waveforms at wrist with colour and waveforms.

**12. Upper limb venous –** IJV, subclavian vein, axillary vein, brachial veins – waveforms to demonstrate phasicity. Only take images of basilic and cephalic veins if there is evidence of superficial venous pathology/thrombo-phlebitis.

**13. Fistula –** radio-cephalic – subclavian and waveform, brachial and waveform, radial artery prox and distal to fistula with waveform. The anastomosis with velocities and diameter. Fistula image with colour, outflow/cephalic vein with three volume flow measurements and vessel diameter. Record on image location of volume flow and diameter in relation to elbow crease.

**14. GCA –** Bilateral Superficial Temporal artery, frontal and parietal branches, and axillary arteries with colour flow image in TS and LS. IMT measurements of bilateral Superficial Temporal artery, frontal and parietal branches, and axillary arteries in TS with colour flow. Spectral waveforms only if stenosis present. In the presence of hypoechoic halo, TS and LS with colour flow Doppler including IMT measurement (US machine measures in cm however in the scan report should be reported in mm).

**References:**

1. RCR position statement on the Records Management Code of Practice for Health and social care 2016: application of the Code to radiology records retention protocols December 2017





[https://www.rcr.ac.uk/sites/default/files/position\\_statement\\_records\\_management\\_code\\_practice.pdf](https://www.rcr.ac.uk/sites/default/files/position_statement_records_management_code_practice.pdf)

2. Guidelines and standards for implementation of new PACS/RIS solutions in the UK (2011) The Royal College of Radiologists.BFCR(11)4  
<https://www.rcr.ac.uk/publication/guidelines-and-standards-implementation-newpacsris-solutions-uk>



## Protocols for non-invasive and minimally invasive assessments

### Independent Vascular Services Ltd

#### Change History:

Version Number	Reason for Change	CRN	Effective Date
01	New issue	n/a	01/01/2013
02	Change layout		01/03/2013
03	Additions of CEUS/HAVS protocols	103	26/02/2014
04	Additions to Carotid/venous protocols	107	25/07/2014
05	Amendment to Macc rescan protocol	112	06/11/2014
06	Amendments to toe pressures	118	19/03/2015
07	Addition of ECA criteria	125	27/04/2015
08	Addition of Warrington DVT protocol	126	25/06/2015
09	Change in venous protocol	155	11/03/2016
10	Change to abdominal protocols	171	4/10/2016
11	Change to lower limb venous protocol content/layout	172	4/10/2016
12	Addition of MALS protocol	173	4/10/2016
13	Addition of PAES protocol	174	4/10/2016
14	Addition of upper limb venous protocol	175	3/11/2016
15	Addition to popliteal entrapment protocol	183	11/03/2017
16	Addition SM Beacon protocol, removal Macclesfield rescan policy	185	24/04/2017
17	Addition of UHSM specific protocols	195	20/10/2017
18	Addition of Stepping Hill DVT protocols/local CIA aneurysm screening protocols	213	30/01/2018
19	Lower limb arterial velocity ratio protocol	225	27/02/2018
20	AAA ML measurement amendment	238	20/07/2018
21	Units of measurement amendment	242	11/02/2019
22	NM DVT rescan change	259	15/01/2020
23	AAA amendment	262	06/02/2020
24	Carotid velocity change/Reduced term clarification	279	17/02/2021
25	Iliac DVT scanning rationale	286	09/08/2021





26	Removal of AVP	291	26/01/2023
27	Thigh venous reflux – dependent angle	296	29/01/2023
28	GCA protocol/CEUS reference	306	01/02/2023

Prepared By	Date	Approved by	Date
T.Gall	01/01/2013	R.Pole	01/01/2013

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**CL1.1**

**1. Patient Identification, preparation and care**

- a) Notes and/or referral letter should be read prior to approaching patient to confirm examination type.
- b) Patient should be identified in the waiting area by name alone.
- c) Patient should be directed to the examination room with aid from the clinical vascular scientist, CVS, (if necessary). If patient is a child or vulnerable adult then always scan in the presence of a parent/carer.
- d) Once in the examination room, the CVS should identify themselves, and then the patient details should be confirmed by name, date of birth, and address. These details should be added to the examination sheet.
- e) Patient should be asked what symptoms they have been experiencing or 'do they know why they are here?'
- f) CVS should explain briefly what they intend to do, gain verbal informed consent and put the patient at ease. For examination using contrast agents written consent should be obtained.
- g) If consent not obtained patient should be directed back to ward/physician or A&E etc. Report on database patient attended but refused scan and any details surrounding visit. Log refusal on incident log on shared drive.
- h) Patient is then asked to remove any necessary clothing or jewellery (with help of CVS if required). Explain that the gel is hypo-allergenic and water soluble so will not stain clothes.
- i) CVS should assist the patient on to the examination couch and ensure patient is comfortable, (do not lift patients – mandatory manual handling instruction).
- j) Examination is performed as per relevant protocol.
- k) Patient should be assisted off the couch once they feel able, (do not lift patients). CVS should warn the patient that they may feel dizzy or lightheaded if they sit up too quickly.
- l) CVS should explain where the results will be forwarded and who will explain the results. CVS could estimate a timeframe for the results to reach the referring clinician. CVS should not explain the outcome of the examination unless specifically directed by referring clinician.
- m) CVS needs to arrange equipment to ensure maximum possible comfort and to reduce the likelihood of musculo-skeletal injury.



- n) If there is an unexpected diagnosis that requires urgent clinical management then staff should understand the importance of contacting the vascular team on-call and trying to get the patient an urgent vascular opinion. See 'Red Flag policy' on shared drive.
- o) If you require to mark the skin, please use the sterile disposal pens and tape measures available. Do not use normal pens to mark the leg – this is a cross infection risk.
- p) It is standard policy to issue a report as soon as possible after the completion of the report. Reports from all patients are issued either in an electronic or paper format within 8 hours of completion of the vascular ultrasound report. If inpatient or Red Flag patient the vascular ultrasound report is placed in the notes or placed electronically on the host Trust wide reporting system within 10 minutes. If a Red Flag patient then the report will be immediately faxed to the consultant with a follow up phone call to ensure that it has arrived.



**CL1.2****2. Basic guidelines****Basic colourflow set-up**

Whilst visualising a vessel optimum colourflow is described as wall-to-wall filling of the vessel without colourflow scatter outside the vessel wall. This can be achieved by selecting the appropriate default setting, steering the colourflow box and adjusting the colourflow gain, wall filter and colourflow velocity functions. In addition, the colour velocity range needs to be set to allow slight aliasing.

**Velocity measurements**

The Doppler sample volume is placed in the area of fastest flow (as indicated by the colourflow map). The angle correct line should be set at 60 degrees and should lie parallel to the blood flow achieved by 'tip-toe' the transducer movement. If transducer movement cannot achieve parallel flow then the angle correct line should be altered to lie parallel with the blood flow, (but angle should be less than 60 degrees).

**Safety of Ultrasound and ALARA Principle**

There are two documented potential mechanisms for ultrasound to cause harm to patients. These are heating of soft tissue and cavitation<sup>2,4,12</sup>.

Both of these bio-effects are related to output intensity and exposure time to ultrasound. The potential for thermal heating is displayed as the TI or thermal index and the potential for cavitation as MI or mechanical index.

There are three options for TI, being TIS – thermal index in soft tissue, TIB – thermal index with focus close to bone and TIC for trans-cranial imaging applications<sup>2</sup>.

There are no documented index thresholds for the different modality and control settings. The principle universally accepted by all ultrasound practitioners is the ALARA or 'As low as reasonably achievable' principle. This means that the total output energy applied to the patient must be kept as low as possible by reducing output power to its lowest level without compromising on image quality and by limiting exposure time without rushing a scan<sup>12</sup>.

It is the clinical vascular scientists' responsibility to control the total energy emitted to the patient and must reconcile exposure time with diagnostic image quality<sup>12</sup>.



2. Gourgiotis, S., Aggelakas, J., Salemis, N., Elias, C., Georgiou, C. 2008. Diagnosis and surgical approach of popliteal artery entrapment syndrome: a retrospective study. *Vascular health and risk management*. 4(1), pp83-86.
3. Wright, L.B., Matchett, W.J., Cruz, C.P., James, C.A., Culp, W.C., Eidt, J.F., McCowan, T.C. 2004. Popliteal artery disease: diagnosis and treatment. *Radiographics*. 24(2), pp.467-479.
4. Roche-Nagle, G., Wong, K.T., Oreopoulos, G. 2009. Vascular claudication in a young patient: popliteal entrapment syndrome. *Hong Kong medical journal*. 15(5), pp.388-390.
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6. Lamb, C.M., Davies, C.G., Whitbread, T. 2010. Two Cases of Misdiagnosed Popliteal Artery Entrapment Syndrome. *European Society for Vascular Surgery*. 20, pp.e16-e18.
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8. Thrush, A., Hartshorne, T. 2010. *Vascular ultrasound: How, Why and When*. 3<sup>rd</sup> ed. Churchill Livingstone. Elsevier.

## CL1.7

### 7, Lower limb venous duplex assessment

#### a) General

Where possible, patients are assessed whilst standing, the majority of weight on the contra-lateral limb. The ipsilateral limb should be non-weight bearing to avoid muscular contraction of the veins. The knee should be slightly flexed and the foot turned outwards.<sup>12</sup> For assessment of the popliteal and calf veins, the patient may sit on the edge of the bed placing their foot in the CVS's lap, alternatively their feet may be placed on a raised stool. The thigh should slope downwards avoiding compression from the bed; the knee should be flexed with the calf muscles as relaxed as possible.<sup>2</sup> There be occasions when you will need to assess for venous reflex in the thigh when the patient is sitting, if possible you need to avoid a horizontal thigh whilst assessing the femoral vein for reflux. Ideally to allow for the assessment of reflex and to minimise any external compression the thigh needs to be dependent for this assessment.

A mid frequency linear array transducer should be used (12-3 MHz linear array) to image the proximal leg and calf veins.<sup>1</sup> A lower frequency curvilinear array transducer (5-1 MHz curvilinear array) should be used if it is necessary to image the iliac veins and inferior vena cava (IVC).<sup>1</sup> An appropriate venous default setting should be selected on the machine to ensure that low venous flow can be detected<sup>1,3</sup>.

On calf augmentation all veins should fill from wall-to-wall with uniform blue colour. If the vein does not fill wall-to-wall, thrombus may be present. Investigation using different steering angles, lower colour PRF and wall filter settings should be utilised to optimise colourfilling.<sup>3</sup> On release of the calf there should be no or very slight (<0.5s)





retrograde flow, which indicates no significant reflux disease.<sup>4</sup> Vein patency or obstruction should also be confirmed by ultrasound compression.<sup>1</sup>

#### **b) Deep Venous Thrombosis Assessment (12-3MHz linear array)**

The transducer is placed in the groin in transverse plane and the common femoral vein (CFV) is identified medial to the common femoral artery.<sup>3</sup>

The Doppler sample volume is placed in the CFV, corrected to a 60 degree angle and steered to align parallel with common femoral vein flow. The sample volume gate should span the full diameter of the lumen.<sup>1,8</sup> Venous flow should be phasic with respiration. The patient is asked to perform a Valsalva manoeuvre, i.e. a cough. If a cough does not produce a satisfactory response, a full Valsalva manoeuvre should be performed.<sup>1,6</sup> Ask the patient to take a breath in and hold it, then to increase the pressure in their thorax. This is achieved by asking the patient to 'bear down' – pretending to go to toilet.<sup>1,4</sup> This should result in a temporary reversal of venous flow and indicate patency of proximal veins. With a proximal obstruction, flow in the CFV will be continuous and aphasic with respiration, with poor or no response to Valsalva manoeuvre.<sup>1</sup> If this occurs then the CVS should scan the iliac veins and IVC to assess whether there is a proximal DVT and/or a mass causing external compression of the vein.<sup>1,5,6</sup>

Following completion of the Valsalva manoeuvre, the common femoral vein should be compressed using external transducer pressure, to confirm patency.<sup>1</sup> Assessment of competency (using colour/spectral Doppler) and patency (using compression) of all other deep proximal veins should be performed as follows. The distal CFV bifurcates into two deep veins. The deeper vein is the profunda femoris vein, the more superficial vein is the superficial femoral vein (SFV). The profunda femoris origin should be assessed whilst the SFV should be assessed along its length, adopting an increasingly antero-medial approach.<sup>2,5</sup> The popliteal vein is located within the popliteal fossa – care should be taken to scan as proximally as possible to overlap with the distal SFV.<sup>1</sup>

Manual compression of the deep veins should be repeated at regular intervals (2-3cm); failure to fully compress the veins may indicate the presence of thrombus.<sup>2</sup> The echogenicity of the thrombus indicates its age.<sup>11</sup> Thrombus becomes increasingly echogenic over time, as it becomes more organised.<sup>1</sup> In time, the vessel may begin to re-canalise – old residual thrombus can be seen to produce a scarred appearance, with multiple channels of flow seen.<sup>1</sup> Slow or partial re-canalisation can result in deep venous insufficiency.<sup>1</sup> Competency is assessed by calf augmentation using both colour and spectral Doppler - on release of the calf there should be no or very slight (<0.5sec) retrograde flow, which indicates no significant reflux.<sup>4</sup>

Deep calf veins should be assessed using manual compression, colourflow and spectral Doppler to assess competency. The transducer is placed into the popliteal fossa and the popliteal vein is identified lateral to the mid line. Up to eight gastrocnemius veins may be visualised in the proximal calf, within the gastrocnemius muscle.<sup>2</sup> The soleal veins





are imbedded in the soleus muscle and are often less easily identified. Several soleal veins may be present which may have connections with other deep calf veins – often the posterior tibial or peroneal veins. Soleal veins are identified more distally than the gastrocnemius veins.<sup>2</sup> If gastrocnemius or soleal veins appear particularly dilated, they should be assessed for competency using colour/spectral Doppler.

The anterior tibial veins may be seen as the first deep communication with the popliteal vein. Distal to this junction the tibio-peroneal trunk veins divide to form the posterior tibial and peroneal veins.<sup>1,12</sup> It is sometimes easier to trace the deep calf veins from the ankle proximally. Placing the transducer posterior to the medial malleolus, both posterior tibial veins can be visualised adjacent to the posterior tibial artery.<sup>2</sup> If the probe is angled slightly posteriorly the peroneal artery and veins should be visualised deep to the posterior tibial vessels.<sup>2</sup> Placing the transducer on the anterior aspect of the ankle, the anterior tibial artery and veins can be visualised and traced.<sup>14</sup> Placing your thumb and first finger on the antero-medial or antero-lateral aspects of the ankle and applying pressure can augment flow in posterior tibial, anterior tibial and peroneal veins in order to assess competency.<sup>1,2</sup>

When a DVT scan is requested the LSV, SSV and their junctions with the deep venous system should be assessed for superficial thrombophlebitis and obvious signs of incompetence.<sup>1,2,11</sup> If the LSV is incompetent within 0.5cm of the SFJ, it is assumed that the SFJ is slightly incompetent even if no reflux is seen in the CFV.

Differential diagnoses of clinical DVT include (but are not limited to): Bakers cysts, superficial oedema, cellulitis, lymphoedema, thrombophlebitis, popliteal arterial aneurysms and superficial venous incompetence. If you identify an abnormal lesion during the course of your scan, note site, dimensions and descriptive information.

### **Iliac Vein Scanning**

We do not routinely scan the iliac veins when scanning for a DVT as the cough or Valsalva manoeuvre is usually sufficient to diagnose any proximal disease. However there are certain scenarios when we need to scan the iliac veins to be clinically certain:

- Negative or poor Valsalva response
- Obvious leg swelling in the thigh
- Evidence of collateral veins in the proximal thigh/groin/abdomen
- Evidence of thrombus in the common femoral or bifurcation
- Previous known iliac DVT
- Unable to adequately visualise the common femoral or bifurcation (eg due to scarring, infection, injection site etc):

### **Rescan Policy**

In some situations it is difficult to be certain that a vein is patent along its length. In such cases we state that we are “unable to fully exclude a DVT”. The scan is equivocal





and upon the clinicians discretion usually requires a rescan 6-8 days later to check for DVT progression.<sup>2</sup> Local protocols differ slightly as below:

**Oldham/NM:** The patient is brought back to have a further scan following an equivocal result. The equivocal vein and up to the popliteal vein is rescanned assessing for progression of the potential DVT.

**South Manchester/Bury/Stepping Hill:** The patient is brought back to have a further scan following an equivocal result. The symptomatic leg is fully rescanned from the CFV to ankle.

**Bolton/Blackpool/Arrowe Park/:** The patient is brought back to have a further scan following an equivocal result. The symptomatic leg is rescanned from the CFV to popliteal vein only, assessing for progression of the potential DVT in line with NICE guidelines

### **Stepping Hill – Additional Information**

DVT referrals can be accepted from HASU (ED or A10) or the rapid access stroke clinics to aid patient flow through the ward/clinic. The patients are sent back to the ward/clinic with the result and the ward/clinician is informed of an equivocal result so that the patient can be brought back in a week for a rescan. The ward or clinician in clinic should arrange this and send us a repeat referral.

### **c) Varicose Vein Assessment**

A full DVT scan is performed, as per the above protocol. Evidence of deep venous insufficiency and previous DVT should be clearly noted in the report. The superficial system should be assessed as below:

#### **Long Saphenous Vein**

Moving distally along the common femoral vein, the long saphenous vein (LSV) will appear as a superficial medial branch. Assessment of competency at the level of the sapheno-femoral junction (SFJ) should be performed by calf augmentation using colour/spectral Doppler.<sup>1</sup> If the LSV is incompetent within 0.5cm of the SFJ, it is assumed that the SFJ is slightly incompetent, even if no reflux is seen in the CFV. The (LSV) should be traced along its length in longitudinal and transverse planes, as isolated segments of incompetence may be identified. Any incompetent branches/perforators should be noted.<sup>2</sup>

#### **Short Saphenous Vein**

The short saphenous vein (SSV) is identified in the upper calf and traced distally to ensure that it remains within the fascia into the lower calf. The SSV is checked for competency and patency and then traced proximal to its junction with the popliteal vein.<sup>10</sup> Any incompetent branches/perforators should be noted.<sup>2</sup> In the presence of SSV incompetence, the popliteal vein must be viewed proximal and distal to the sapheno-popliteal junction (SPJ) to determine whether the junction is incompetent.<sup>1</sup> In some





cases an SPJ may not be identified and/or the SSV may communicate with the vein of Giacomini which lies just beneath the fascia and extends into the proximal posterior thigh and may connect to the LSV.<sup>12</sup>

If the SPJ is incompetent, then its location needs to be recorded – the distance measured proximal to the knee crease and lateral/medial to the mid line.<sup>2,5</sup>

The distance of any incompetent perforators from the medial malleolus should be noted and marked if the patient is undergoing superficial venous surgery.<sup>2</sup>

Table: Grading of incompetence.<sup>1</sup>

Grade	Reflux Duration
Normal	<0.5 seconds
Slightly Incompetent	0.5 – 1.0 seconds
Incompetent	>1.0 seconds

### Primary Varicose Vein Protocol

The Vascular Consultant will review patient referral letters and specifically request the limited protocol outlined below.<sup>13</sup>

The protocol should be used in conjunction with the Section 5 'Lower limb venous duplex assessment' from 'Protocols for non-invasive and minimally invasive assessments' for explanation of patient positioning probe, colourflow and Doppler settings.<sup>2</sup>

1. Assess common femoral vein for patency and competency.<sup>1</sup>
2. Comment of absence or presence of sapheno-femoral junction (SFJ) and its competency.<sup>2</sup>
3. Comment on absence or presence of long saphenous vein (LSV) and its competency.<sup>13</sup>
4. Comment on the absence or presence of anterior or posterior veins which form junctions to the LSV within 3cm of the SFJ, measure the distance of the junction to the SFJ, and comment on the competency of the vein.<sup>2,13</sup>
5. If an incompetent thigh vein is identified but the SFJ is absent, the position the vein reforms should be identified and measured and any incompetent thigh perforators identified and measured.<sup>17</sup>
6. Assess popliteal vein for patency and competency.<sup>2,13</sup>
7. Comment of absence or presence of sapheno-popliteal junction (SPJ) and its competency.<sup>1</sup>
8. Comment on absence or presence of short saphenous vein (SSV) and its competency.<sup>2,13</sup>
9. Incompetent thigh veins and SSV should be assessed for suitability for EVLT or VNUS as per full EVLT protocol (see copy below).
10. All other deep veins do not need assessment unless there is evidence of thrombus in the common femoral or popliteal veins.<sup>14</sup>
11. Calf perforators do not need to be assessed or measured.<sup>2,13</sup>

Patient will be reviewed by the Vascular Consultant and if necessary referred for full





Venous duplex protocol.

### Endovenous Laser Treatment/ VNUS protocol

The inclusion criteria are as follows:

1. The LSV needs to follow a relatively straight course; it will be difficult to pass the laser up a tortuous vein. If the LSV leaves the fascia or becomes tortuous state the distance from the medial malleolus and also comment on general position.
2. It needs to be checked whether the LSV is bifid – both veins can be treated providing they are of suitable diameter.
3. The vein diameter (AP) needs to be measured at the junction, mid-thigh, knee level and the minimum diameter stated. If the LSV dilates make another diameter measurement and its distance from medial malleolus.
4. Need to ensure LSV is widely patent – no evidence of recent/old thrombophlebitis.
5. Any incompetent branches close to the SFJ need to be measured. If there is an incompetent branch less than 1-1.5cm from the SFJ then the patient will not be suitable for EVLT. Other major branches should also be identified.
6. Redo LSV's can be retreated with the laser if they are of a suitable diameter so provide measurements as above. State whether there is an intact/reformed SFJ or not.
7. As with all superficial venous procedures the whole deep venous system needs to be competent and patent (Except for simple varicose vein assessments, where the patency and competency of the CFV and popliteal vein only need to be checked).
8. Incompetent thigh accessory veins can be treated with EVLT/VNUS. Minimum and maximum diameters of these veins must be recorded, and if they exit the fascia, the approximate treatable length should be measured (from the SFJ to point at which they leave the fascia).

#### d) Venous marking

The patient should be asked to point out the major varicose veins or where they feel discomfort.<sup>14</sup> Under direction of the patient any obvious varicosities should be traced to their junctions with the major venous branches and marked. Any perforators should be marked. The sapheno-femoral and sapheno-popliteal junctions should be marked if incompetent.<sup>15</sup>

When marking the SPJ or perforators prior to surgery you need to ensure the mark is directly above the structure of interest.<sup>2,15</sup> In the longitudinal section, move the leading edge of the probe so the structure is just off the screen and mark either side of the leading edge.<sup>1</sup> In TS, again move the leading edge so the structure is just off the screen and mark the skin on the upper edge of the probe.<sup>1,15</sup> This should result in three marks on the skin surface and where the imaginary lines bisect marks the structure. Extend the dots towards the bisecting point but do not join up as the permanent ink has been known to tattoo the skin during surgery. The final mark should resemble an upside 'T' without a connecting section.<sup>2,15</sup>





**e) Long (LSV) and short saphenous vein (SSV) mapping, 12-3MHz probe**

In some cases of lower limb bypass surgery the saphenous veins are used as the conduits. Surgery that uses an autogenous vein can be greatly aided by a detailed preoperative venous assessment.<sup>2,15</sup> Patient is assessed, when possible, in a standing position or sitting to facilitate maximum filling of veins.<sup>1</sup> The LSV or SSV are identified, (outlined above in "venous duplex assessment") and traced along their length in L.S. and T.S. to confirm patency and compression should be used to exclude thrombus/incompetency.<sup>14</sup>

In transverse section – A.P. diameters are measured in the proximal, mid and distal thigh for the LSV, and proximal, mid and distal calf for the LSV and SSV. In transverse section the probe is moved so the vein is just off the edge of the screen (ensuring probe is perpendicular to vessel) and marks are made along its length using the indelible pen to map out the vein.<sup>1,2,16</sup>

The course of the vein is marked on leg, allowing improved use of veins and better planning of the specific surgical approach. It minimises the dissection and reduces the frequency of wound complications.<sup>15</sup>

To be suitable as a bypass the vein has to be greater than 0.30cm and not varicose, thrombosed or tortuous.<sup>2,15</sup>

A full length review of the LSV will be produced with the tributaries marked and specific measurements recorded;

**Vessel Inner Diameter** (These will be recorded at 6 specific points)

Proximal Thigh, Mid-Thigh, Distal Thigh, Proximal Calf, Mid Calf, Distal Calf

**Varicosities/Tributaries** (including perforators)

The location and number of tributaries and possible varicosities will be marked and recorded.

**Intramural Thrombus**

The presence and location of any intramural thrombus will be noted.

**Total usable length**

The total usable length will be recorded based on a diameter greater than 0.3 cm and is measured from the sapheno-femoral junction.

**Depth from skin surface**

The depth from the skin surface will be marked.

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## 8. Trans-vaginal ultrasound for pelvic vein incompetence (TVDU)

CL1.8

Document Control – R.Pole, Operations Director  
Version 28:01/02/2023. Review date 27/08/2023



<b>Reason</b>	Varicose vein			
<b>Outcome</b>	DVT negative, Incompetence - Superficial			
	<b>Right</b>		<b>Left</b>	
<b>Deep Veins</b>	<b>Patency</b>	<b>Competency</b>	<b>Patency</b>	<b>Competency</b>
Common Iliac Vein			Not Assessed	
External Iliac Vein			Not Assessed	
Internal Iliac Vein			Not Assessed	
Common Femoral Vein			Widely Patent	Competent
Profunda Vein			Widely Patent	Competent
Superficial Femoral Vein			Widely Patent	Competent
Popliteal Vein			Widely Patent	Competent
Posterior Tibial Vein			Widely Patent	Competent
Anterior Tibial Vein			Widely Patent	Competent
Peroneal Vein			Widely Patent	Competent
Soleal Vein			Patent	
Gastrocnemius			Patent	
<b>Superficial Veins</b>				
Saphenofemoral Junction			Patent	Incompetent
L Saphenous Vein Above			Patent	Incompetent
L Saphenous Vein Below			Patent	Isolated Incompetence
Vein of Giacomini			Patent	Competent
Saphenopopliteal Junction			Not Identified	
S Saphenous Vein			Patent	Competent
<b>Evidence of D.V.T.</b>				
Above the knee			No	
Popliteal			No	
Below the knee			No	

## Notes

### LEFT LOWER LIMB VENOUS DUPLEX ASSESSMENT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

All measurements are proximal to the medial malleolus unless otherwise stated.

Sapheno-femoral junction (SFJ) is incompetent. Long Saphenous vein (LSV) is incompetent and linear in the thigh. Incompetent branch noted in the mid thigh (52cm) that then loops around and communicates in the mid thigh (49cm). LSV remains incompetent until the prox calf (32cm) where an incompetent branch is

Assessed by Emily Davies, MCVS

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noted forming extensive calf varicosities. LSV is competent distal to this branch. Small region of old non-occlusive material in the distal thigh ?from previous surgery

Transverse (AP) dimensions of LSV:

Proximal thigh - 0.57cm

Mid thigh - 0.63cm

Distal thigh - 0.68cm

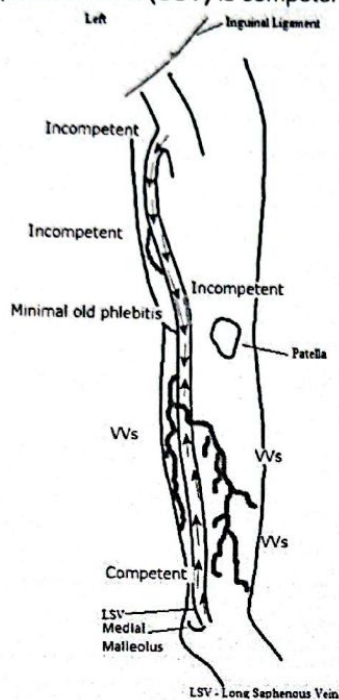
Proximal calf - 0.53cm

Mid calf - 0.22cm

Distal calf - 0.15cm

Sapheno-popliteal junction (SPJ) was not identified.

Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.



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**Reason** Varicose vein  
**Outcome** DVT negative, Incompetence - Superficial

	<b>Right</b>		<b>Left</b>	
	<b>Patency</b>	<b>Competency</b>	<b>Patency</b>	<b>Competency</b>
<b>Deep Veins</b>				
Common Iliac Vein	Not Assessed		Not Assessed	
External Iliac Vein	Not Assessed		Not Assessed	
Internal Iliac Vein	Not Assessed		Not Assessed	
Common Femoral Vein	Widely Patent	Competent	Widely Patent	Competent
Profunda Vein	Widely Patent	Competent	Widely Patent	Competent
Superficial Femoral Vein	Widely Patent	Competent	Widely Patent	Competent
Popliteal Vein	Widely Patent	Competent	Widely Patent	Competent
Posterior Tibial Vein	Widely Patent	Competent	Widely Patent	Competent
Anterior Tibial Vein	Widely Patent	Competent	Widely Patent	Competent
Peroneal Vein	Widely Patent	Competent	Widely Patent	Competent
Soleal Vein	Not Identified		Not Identified	
Gastrocnemius	Patent		Patent	
<b>Superficial Veins</b>				
Saphenofemoral Junction	Not Identified		Patent	Incompetent
L Saphenous Vein Above	See notes	Competent	Patent	Incompetent
L Saphenous Vein Below	See notes	Incompetent	Patent	Incompetent
Vein of Giacomini	Patent	Competent	Patent	Competent
Saphenopopliteal Junction	Not Identified		Not Identified	
S Saphenous Vein	Patent	Competent	Patent	Competent
<b>Evidence of D.V.T.</b>				
Above the knee	No		No	
Popliteal	No		No	
Below the knee	No		No	

## Notes

### BILATERAL LOWER LIMB VENOUS DUPLEX ASSESSMENT

\*All measurements are proximal to the medial malleolus unless otherwise stated.

#### RIGHT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

The sapheno-femoral junction (SFJ) was not identified ?previous surgery. The long Saphenous vein (LSV) was not identified in the prox thigh. LSV appears to reform in the mid thigh (67cm) and is patent and incompetent for 6cm before not being identified again ?previous surgery. LSV reforms again in the mid calf

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(24cm) and is incompetent. Incompetent perforator noted in the distal calf (14cm). Incompetent branch noted in the distal calf (10cm) forming medial calf varicosities.

Transverse (AP) dimensions of LSV:

Mid calf - 0.29cm

Distal calf - 0.23cm

Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.

#### LEFT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is competent. Long Saphenous vein (LSV) becomes incompetent at the prox thigh (2.39cm distal to the SFJ valve site). LSV is linear and incompetent for ~16cm before leaving the fascia in the mid thigh (61cm) and forming medial/ anterior calf and thigh varicosities. LSV reforms in the mid calf (26cm), via incompetent branch, and is incompetent distally.

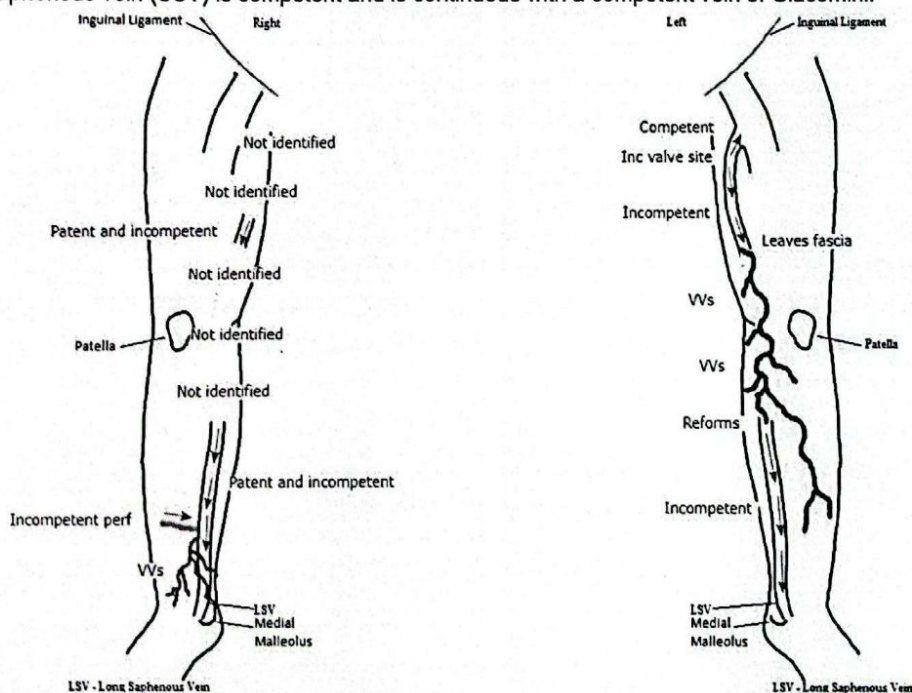
Transverse (AP) dimensions of LSV:

Proximal thigh - 0.53cm

Mid calf - 0.26cm

Distal calf - 0.24cm

Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.



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Reason Varicose vein  
Outcome DVT negative, Incompetence - Superficial

	Right		Left	
Deep Veins	Patency	Competency	Patency	Competency
Common Iliac Vein	Not Assessed			
External Iliac Vein	Not Assessed			
Internal Iliac Vein	Not Assessed			
Common Femoral Vein	Widely Patent	Competent		
Profunda Vein	Widely Patent	Competent		
Superficial Femoral Vein	Widely Patent	Competent		
Popliteal Vein	Widely Patent	Competent		
Posterior Tibial Vein	Widely Patent	Competent		
Anterior Tibial Vein	Widely Patent	Competent		
Peroneal Vein	Widely Patent	Competent		
Soleal Vein	Widely Patent			
Gastrocnemius	Widely Patent			
Superficial Veins				
Saphenofemoral Junction	Patent	Competent		
L Saphenous Vein Above	Patent	Isolated Incompetence		
L Saphenous Vein Below	Patent	Isolated Incompetence		
Vein of Giacomini	Patent	Competent		
Saphenopopiteal Junction	Not Identified			
S Saphenous Vein	Patent	Competent		
Evidence of D.V.T.				
Above the knee	No			
Popliteal	No			
Below the knee	No			

## Notes

### RIGHT LOWER LIMB VENOUS DUPLEX ASSESSMENT

\*All measurements are proximal to the medial malleolus unless otherwise stated.

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is competent. Long Saphenous vein (LSV) communicates with proximally tracking vein 0.5cm distal to the SFJ that causes the LSV to become incompetent ?pelvic source. Another incompetent communication noted in the prox thigh (63cm and 10cm distal to the SFJ) with a proximally tracking vein ?pelvic source. Incompetent branch noted in the distal thigh (41cm) forming medial/ posterior

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calf varicosities. LSV is competent distal to this branch. Incompetent communication with varicosities noted in the distal thigh (35cm) causing the LSV to be incompetent again. Competent perforator noted in the mid calf (18cm). LSV competent distal to this and remains so distally.

**Transverse (AP) dimensions of LSV:**

Proximal thigh - 0.34cm

Mid thigh - 0.47cm

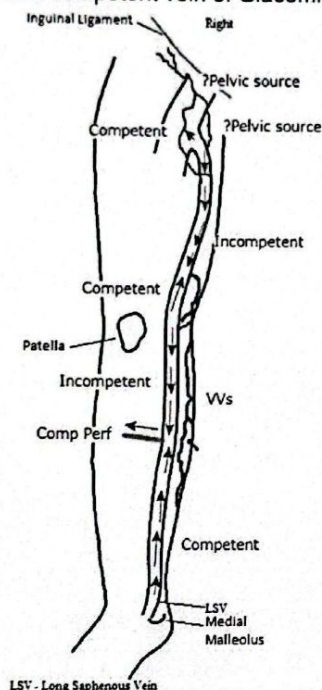
Distal thigh - 0.41cm

Proximal calf - 0.34cm

Mid calf - 0.32cm

Distal calf - 0.27cm

Sapheno-popliteal junction (SPJ) was not identified. Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.



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Reason	Pre-op, Vein map, Varicose vein
Outcome	Widely patent

#### Notes

#### BILATERAL SAPHENOUS VEIN MAPPING AND MARKING

##### RIGHT

The right saphenous-femoral junction (SFJ) is incompetent. The long saphenous vein (LSV) is incompetent in the prox to mid thigh. Incompetent branch noted in the mid thigh (45cm) forming medial and anterior thigh/calf varicosities. LSV is competent distal to this branch. Incompetent communication with varicosities noted in the prox calf (25cm) causing the LSV to become incompetent again. Incompetent branch noted in the mid calf (18cm) forming medial calf varicosities. LSV is competent distal to this branch. No evidence of previous superficial thrombophlebitis.

##### Transverse (AP) dimensions:

Proximal thigh - 0.47cm  
Mid thigh - 0.54cm  
Distal thigh - 0.38cm  
Proximal calf - 0.32cm  
Mid calf - 0.36cm  
Distal calf - 0.25cm

##### LEFT

The left long saphenous vein (LSV) is competent and fully compressible along its length, with no evidence of previous superficial thrombophlebitis.

##### Transverse (AP) dimensions:

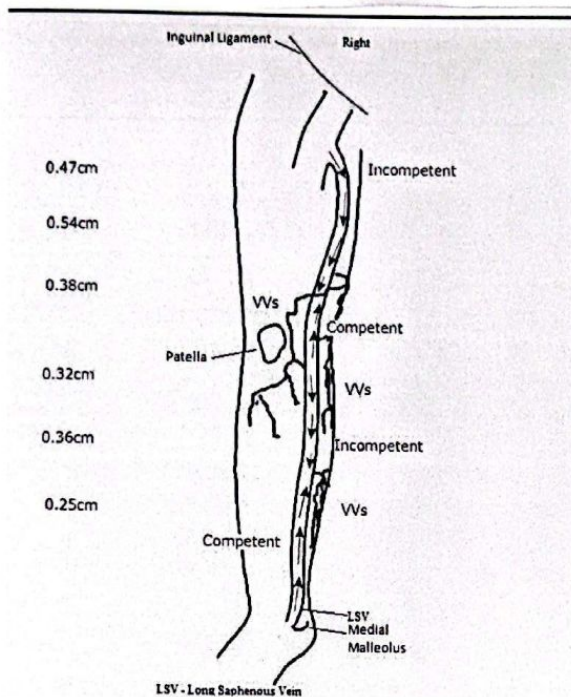
Proximal thigh - 0.38cm  
Mid thigh - 0.31cm  
Distal thigh - 0.28cm  
Proximal calf - 0.24cm, one branch noted  
Mid calf - 0.27cm  
Distal calf - 0.29cm, one branch noted

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**Reason** Varicose vein  
**Outcome** DVT positive - chronic, Incompetence - Superficial

Deep Veins	Right		Left	
	Patency	Competency	Patency	Competency
Common Iliac Vein	Not Assessed			
External Iliac Vein	Not Assessed			
Internal Iliac Vein	Not Assessed			
Common Femoral Vein	Areas of Thrombus	Old Thrombus		
Profunda Vein	Patent	?Competent		
Superficial Femoral Vein	Patent	?Competent		
Popliteal Vein	Patent	?Competent		
Posterior Tibial Vein	Patent	?Competent		
Anterior Tibial Vein	Patent	?Competent		
Peroneal Vein	Patent	?Competent		
Soleal Vein	Not Identified			
Gastrocnemius	Patent			
<b>Superficial Veins</b>				
Saphenofemoral Junction	See notes			
L Saphenous Vein Above	Patent	Incompetent		
L Saphenous Vein Below	Patent	Incompetent		
Vein of Giacomini	Not Identified			
Saphenopopliteal Junction	Patent	Competent		
S Saphenous Vein	Patent	Isolated Incompetence		
<b>Evidence of D.V.T.</b>				
Above the knee	Yes	Old		
Popliteal	No			
Below the knee	No			

#### Notes

##### RIGHT LOWER LIMB VENOUS DUPLEX ASSESSMENT

\*Challenging assessment due to patient limited mobility, habitus and vessel depth.

\*Patient unable to stand for prolonged period of time, examination conducted sat on side of couch ?reliability of competency assessment

\*All measurements are proximal to the medial malleolus unless otherwise stated.

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear patent and ?competent with no evidence of previous DVT apart from minimal old thrombus in the common femoral vein.

Assessed by Emily Davies, MCVS

Printed on 15/07/2024 at 12:39 pm

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Sapheno-femoral junction (SFJ) was not identified due to habitus and vessel depth. Proximal thigh LSV also not identified. Long Saphenous vein (LSV) appears to form in the proximal thigh via a proximally/ medially tracking small calibre, competent vein. Incompetent perforator noted in the prox thigh (75cm) that causes the LSV to become incompetent. Incompetent branch noted in the prox calf (36cm) that forms medial calf varicosities. LSV remains incompetent before leaving the fascia in the mid calf (33cm) forming medial calf varicosities. LSV reforms via incompetent branch in the distal calf (20cm). Incompetent perforator noted (18cm) and LSV then immediately leaves fascia again to form varicosities.

**Transverse (AP) dimensions of LSV:**

Proximal thigh - 0.40cm

Mid thigh - 0.80cm

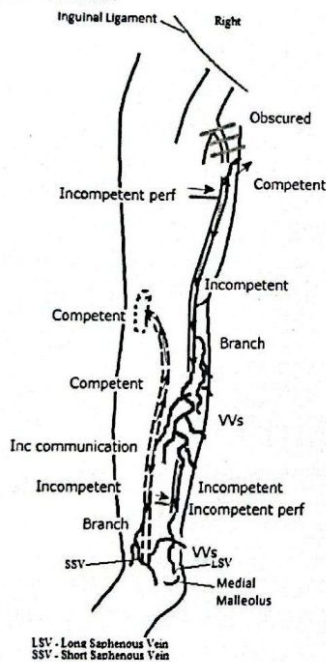
Distal thigh - 0.53cm

Proximal calf - 0.54cm

Short Saphenous vein (SSV) is competent proximally with a competent SPJ. Incompetent communication with calf varicosities identified in the mid calf (27cm) causing the SSV to become incompetent. Incompetent branch noted in the distal calf (18cm) forming medial/ lateral calf varicosities. Scan had to be abandoned due to patient feeling unwell ?competency of distal SSV.

**Transverse (AP) dimensions of SSV:**

Mid calf - 0.39cm



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<b>Reason</b>	Varicose vein
<b>Outcome</b>	DVT negative, Incompetence - Deep , Incompetence - Superficial

	<b>Right</b>		<b>Left</b>	
<b>Deep Veins</b>	<b>Patency</b>	<b>Competency</b>	<b>Patency</b>	<b>Competency</b>
Common Iliac Vein			Not Assessed	
External Iliac Vein			Not Assessed	
Internal Iliac Vein			Not Assessed	
Common Femoral Vein			Widely Patent	Competent
Profunda Vein			Widely Patent	Competent
Superficial Femoral Vein			Widely Patent	Isolated Slight Incompetence
Popliteal Vein			Widely Patent	Isolated Slight Incompetence
Posterior Tibial Vein			Widely Patent	Competent
Anterior Tibial Vein			Widely Patent	Competent
Peroneal Vein			Widely Patent	Competent
Soleal Vein			Widely Patent	
Gastrocnemius			Widely Patent	
<b>Superficial Veins</b>				
Saphenofemoral Junction			Patent	Incompetent
L Saphenous Vein Above			Patent	Incompetent
L Saphenous Vein Below			Patent	Isolated Incompetence
Vein of Giacomini			Occluded	
Saphenopopliteal Junction			Patent	Incompetent
S Saphenous Vein			Occluded	
<b>Evidence of D.V.T.</b>				
Above the knee			No	
Popliteal			No	
Below the knee			No	

## Notes

### LEFT LOWER LIMB VENOUS DUPLEX ASSESSMENT

\*All measurements are proximal to the medial malleolus unless otherwise stated

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT apart from isolated slight incompetence noted in the SFV and POPV

Sapheno-femoral junction (SFJ) is incompetent. Long Saphenous vein (LSV) is incompetent and linear in the thigh with a dilation of 1.23cm in the distal thigh (63cm). Incompetent branch noted at the knee crease (41cm) forming medial/ posterior calf varicosities. LSV is competent distal to this branch. Incompetent

Assessed by Emily Davies, MCVS

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communication with calf varicosities identified in the mid calf (25cm) causing the LSV to become incompetent. Incompetent branch noted in the distal calf (15cm) forming medial calf/ ankle varicosities. LSV is competent distal to this branch and remains so distally.

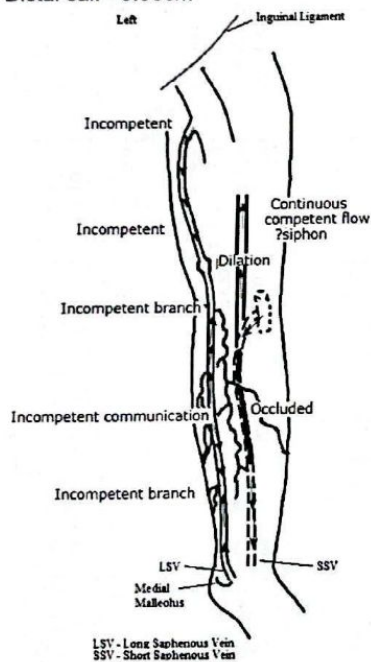
**Transverse (AP) dimensions of LSV:**

Proximal thigh - 0.66cm  
Mid thigh - 0.76cm  
Distal thigh - 0.67cm  
Proximal calf - 0.32cm  
Mid calf - 0.34cm  
Distal calf - 0.37cm

Large and tortuous incompetent SPJ identified. Continuous competent flow identified in the vein of giacomini ?siphon. SSV is chronically occluded from origin to the mid calf ~25cm in length. Incompetent communication with calf varicosities noted in the mid calf that makes the SSV patent and incompetent. SSV remains competent to the ankle. Continuous competent flow identified in the vein of giacomini ?siphon

**Transverse (AP) dimensions of SSV:**

Distal calf - 0.38cm



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**Reason** Varicose vein  
**Outcome** DVT negative, Competent

	Right		Left	
Deep Veins	Patency	Competency	Patency	Competency
Common Iliac Vein	Not Assessed		Not Assessed	
External Iliac Vein	Not Assessed		Not Assessed	
Internal Iliac Vein	Not Assessed		Not Assessed	
Common Femoral Vein	Widely Patent	Competent	Widely Patent	Competent
Profunda Vein	Widely Patent	Competent	Widely Patent	Competent
Superficial Femoral Vein	Widely Patent	Competent	Widely Patent	Competent
Popliteal Vein	Widely Patent	Competent	Widely Patent	Competent
Posterior Tibial Vein	Widely Patent	Competent	Widely Patent	Competent
Anterior Tibial Vein	Widely Patent	Competent	Widely Patent	Competent
Peroneal Vein	Widely Patent	Competent	Widely Patent	Competent
Soleal Vein	Not Identified		Not Identified	
Gastrocnemius	Patent		Patent	
Superficial Veins				
Saphenofemoral Junction	Patent	Competent	Patent	Competent
L Saphenous Vein Above	Patent	Competent	Patent	Competent
L Saphenous Vein Below	Patent	Competent	Patent	Competent
Vein of Giacomini	Patent	Competent	Patent	Competent
Saphenopopliteal Junction	Not Identified		Patent	Competent
S Saphenous Vein	Patent	Competent	Patent	Competent
Evidence of D.V.T.				
Above the knee	No		No	
Popliteal	No		No	
Below the knee	No		No	

#### Notes

#### BILATERAL LOWER LIMB VENOUS DUPLEX ASSESSMENT

#### RIGHT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is competent. Long Saphenous vein (LSV) is competent along length. Sapheno-popliteal junction (SPJ) was not identified. Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.

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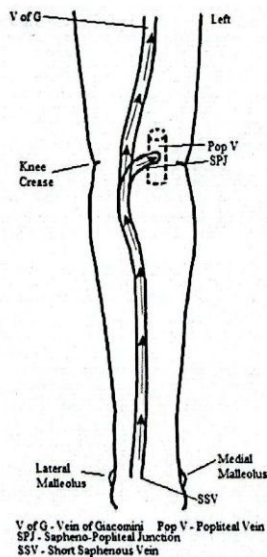
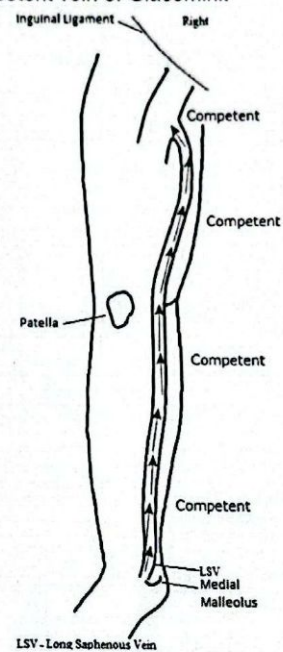
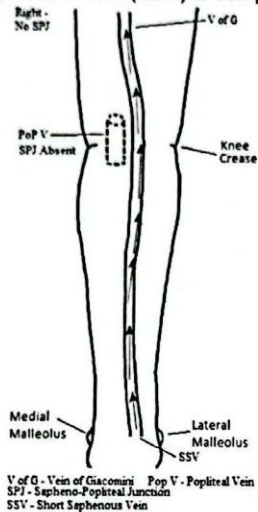
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## LEFT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is competent. Long Saphenous vein (LSV) is competent along length. Sapheno-popliteal junction (SPJ) is patent and competent. Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.



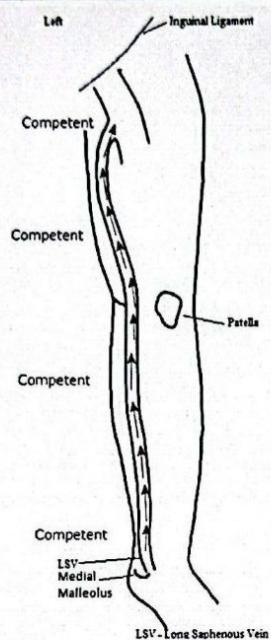
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**Reason** Varicose vein  
**Outcome** DVT negative, Incompetence - Superficial

	Right		Left	
	Patency	Competency	Patency	Competency
<b>Deep Veins</b>				
Common Iliac Vein			Not Assessed	
External Iliac Vein			Not Assessed	
Internal Iliac Vein			Not Assessed	
Common Femoral Vein			Patent	Competent
Profunda Vein			Patent	Competent
Superficial Femoral Vein			Patent	Competent
Popliteal Vein			Patent	Competent
Posterior Tibial Vein			Patent	Competent
Anterior Tibial Vein			Patent	Competent
Peroneal Vein			Patent	Competent
Soleal Vein			Not Identified	
Gastrocnemius			Patent	
<b>Superficial Veins</b>				
Saphenofemoral Junction			Patent	
L Saphenous Vein Above			Patent	Competent
L Saphenous Vein Below			Patent	Isolated Incompetence
Vein of Giacomini			Patent	Isolated Incompetence
Saphenopopliteal Junction			Patent	Competent
S Saphenous Vein			Patent	Isolated Incompetence
<b>Evidence of D.V.T.</b>				
Above the knee			No	
Popliteal			No	
Below the knee			No	

#### Notes

##### LEFT LOWER LIMB VENOUS DUPLEX ASSESSMENT

\*All measurements are proximal to the medial malleolus unless otherwise stated.

\*Challenging examination due to oedema and vessel depth

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear patent and competent with no evidence of previous DVT.

The sapheno-femoral junction (SFJ) was difficult to visualise due to depth. Unable to assess competency. Incompetent anterior thigh vein identified originating off the SFJ, that is tortuous in the very proximal thigh and is then linear for ~11cm before leaving the fascia (57cm) and forming anterior/ medial thigh and calf

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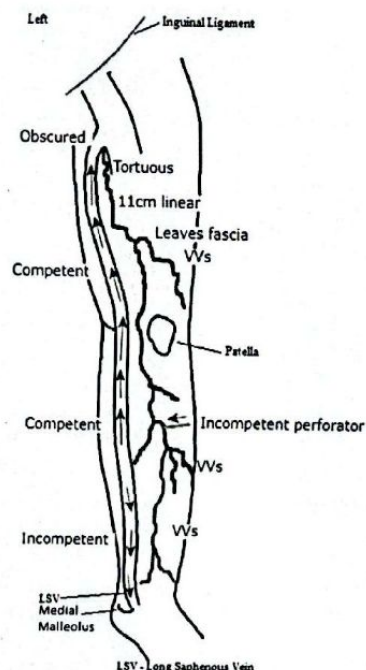
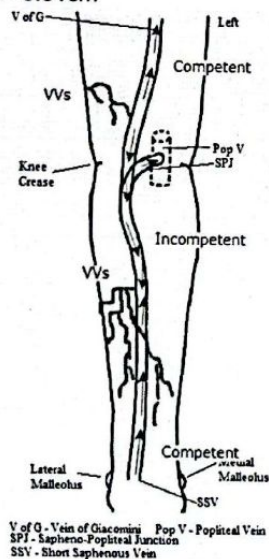
varicosities. Long Saphenous vein (LSV) is competent in the thigh and proximal calf. Incompetent communication with varicosities noted in the mid calf (27cm and 25cm) causing the LSV to become incompetent. The LSV remains incompetent distally. Incompetent perforator communicates with medial calf varicosities in the mid calf (18cm).

Transverse (AP) dimensions of ATV:  
Proximal thigh - 0.54cm

Transverse (AP) dimensions of LSV:  
Proximal thigh - 0.43cm  
Mid thigh - 0.41cm  
Distal thigh - 0.43cm  
Proximal calf - 0.43cm  
Mid calf - 0.33cm  
Distal calf - 0.35cm

Short Saphenous vein (SSV) is incompetent proximally and is continuous with an incompetent vein of Giacomini. The giacomini becomes incompetent in the distal thigh (37cm) due to communication with incompetent varicosities. Sapheno-popliteal junction (SPJ) is patent and competent. SSV is incompetent until an incompetent branch is noted in the mid calf (25cm) that forms medial/ posterior calf varicosities. SSV is competent distal to this branch.

Transverse (AP) dimensions of SSV:  
Proximal calf - 0.40cm  
Mid calf - 0.31cm  
Distal calf - 0.31cm



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**Reason** Varicose vein  
**Outcome** DVT equivocal, Incompetence - Superficial

	<b>Right</b>		<b>Left</b>	
	Patency	Competency	Patency	Competency
<b>Deep Veins</b>				
Common Iliac Vein	Not Assessed		Not Assessed	
External Iliac Vein	Not Assessed		Not Assessed	
Internal Iliac Vein	Not Assessed		Not Assessed	
Common Femoral Vein	Patent	Competent	Patent	Competent
Profunda Vein	Patent	Competent	Patent	Competent
Superficial Femoral Vein	Patent	Competent	Patent	Competent
Popliteal Vein	Patent	Competent	Patent	Competent
Posterior Tibial Vein	See notes		See notes	
Anterior Tibial Vein	See notes		See notes	
Peroneal Vein	See notes		See notes	
Soleal Vein	See notes		See notes	
Gastrocnemius	Patent		Patent	
<b>Superficial Veins</b>				
Saphenofemoral Junction	Patent	Incompetent	Patent	Incompetent
L Saphenous Vein Above	Patent	Incompetent	Patent	Incompetent
L Saphenous Vein Below	Patent	Isolated Incompetence	Patent	Isolated Incompetence
Vein of Giacomini	Patent	Competent	Patent	Competent
Saphenopopliteal Junction	Not Identified		Not Identified	
S Saphenous Vein	Patent where seen	Competent where seen	Patent where seen	Competent where seen
<b>Evidence of D.V.T.</b>				
Above the knee	No		No	
Popliteal	No		No	
Below the knee	Cannot Exclude		Cannot Exclude	

#### Notes

#### BILATERAL LOWER LIMB VENOUS DUPLEX ASSESSMENT

\*All measurements are proximal to the medial malleolus unless otherwise stated.

#### RIGHT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins, proximal to and including the popliteal vein, appear patent and competent with no evidence of previous DVT. Deep calf veins were difficult to visualise due to ulceration and pain levels - unable to exclude a DVT from this scan.

Sapheno-femoral junction (SFJ) is competent. Long Saphenous vein (LSV) is incompetent and linear in the thigh and proximal calf. Incompetent branch noted in the prox/mid calf (19cm) that forms medial calf

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varicosities. LSV is competent distal to this branch.

Transverse (AP) dimensions of LSV:

Proximal thigh - 0.40cm

Mid thigh - 0.52cm

Distal thigh - 0.43cm

Proximal calf - 0.42cm

Mid calf - 0.19cm

Distal calf - 0.17cm

Sapheno-popliteal junction (SPJ) was not identified. Short Saphenous vein (SSV) is competent proximally, however, unable to assess the mid and distal due to dressings.

LEFT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins, proximal to and including the popliteal vein, appear patent and competent with no evidence of previous DVT. Deep calf veins were difficult to visualise due to ulceration and pain levels - unable to exclude a DVT from this scan.

Sapheno-femoral junction (SFJ) is competent. Long Saphenous vein (LSV) is incompetent and linear in the thigh and proximal calf. Incompetent branch noted in the prox calf (25cm) that forms medial calf varicosities. LSV is competent distal to this branch. Incompetent perforator (from gastrocnemius vein) noted in the proximal posterior calf (36cm prox LM) that forms posterior calf varicosities.

Transverse (AP) dimensions of LSV:

Proximal thigh - 0.41cm

Mid thigh - 0.44cm

Distal thigh - 0.42cm

Proximal calf - 0.47cm

Mid calf - 0.13cm

Distal calf - 0.12cm

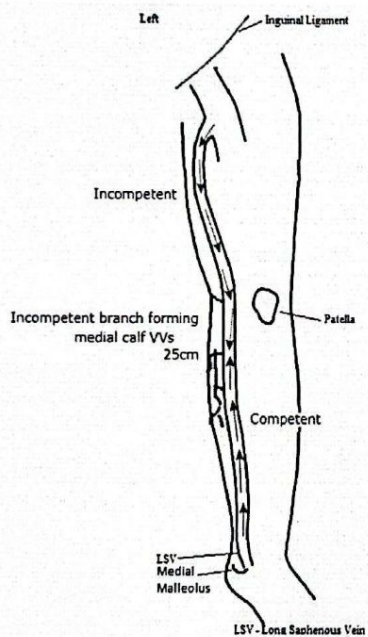
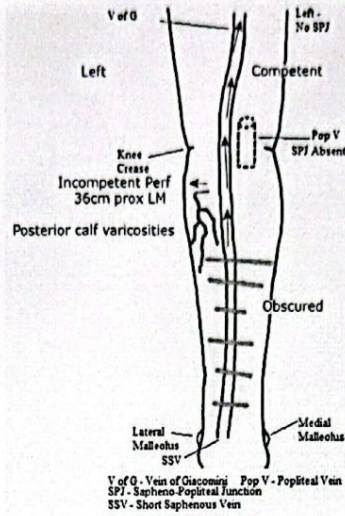
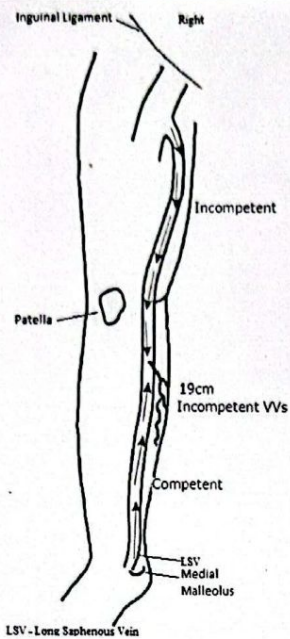
Sapheno-popliteal junction (SPJ) was not identified. Short Saphenous vein (SSV) is competent proximally, however, unable to assess the mid and distal due to dressings.

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**Reason** Varicose vein  
**Outcome** DVT negative, Incompetence - Superficial

	Right		Left	
Deep Veins	Patency	Competency	Patency	Competency
Common Iliac Vein	Not Assessed			
External Iliac Vein	Not Assessed			
Internal Iliac Vein	Not Assessed			
Common Femoral Vein	Patent			
Profunda Vein	Patent			
Superficial Femoral Vein	Patent			
Popliteal Vein	Patent			
Posterior Tibial Vein	Patent			
Anterior Tibial Vein	Patent			
Peroneal Vein	Patent			
Soleal Vein	Not Identified			
Gastrocnemius	Patent			
<b>Superficial Veins</b>				
Saphenofemoral Junction	Patent	See notes		
L Saphenous Vein Above	Patent	Competent		
L Saphenous Vein Below	Patent	Competent		
Vein of Giacomini	Patent	Competent		
Saphenopopliteal Junction	Not Identified			
S Saphenous Vein	Patent	Isolated Incompetence		
<b>Evidence of D.V.T.</b>				
Above the knee	No			
Popliteal	No			
Below the knee	No			

#### Notes

#### RIGHT LOWER LIMB VENOUS DUPLEX ASSESSMENT

\*All measurements are proximal to the medial malleolus unless otherwise stated.

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) was difficult to assess due to depth/ patient habitus, however, appears competent. Long Saphenous vein (LSV) is competent along length. Small calibre varicosities identified in the prox anterior/ lateral thigh that appear to track proximally ?source. Minimal chronic non-occlusive superficial thrombophlebitis identified in these varicosities.

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Sapheno-popliteal junction (SPJ) was not identified.

Short Saphenous vein (SSV) is competent proximally and is continuous with a competent vein of Giacomini.

Incompetent perforator noted in the prox/ mid calf (26cm). SSV is then incompetent distal to this.

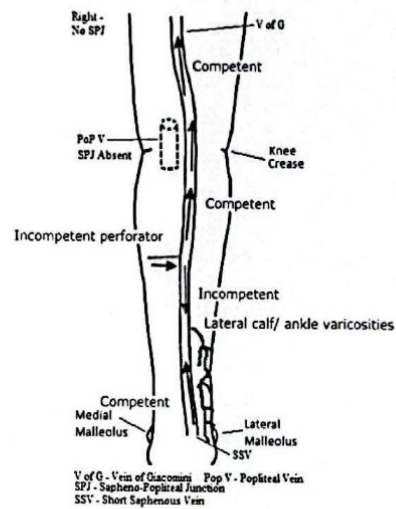
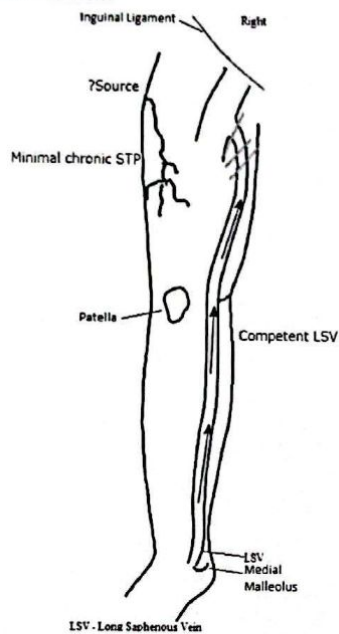
Incompetent branch noted in the distal calf (15cm) that forms extensive lateral calf/ ankle varicosities. SSV is competent distal to this branch.

Transverse (AP) dimensions of SSV:

Proximal calf - 0.20cm

Mid calf - 0.38cm

Distal calf - 0.22cm



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**Reason** Varicose vein  
**Outcome** DVT negative, Incompetence - Superficial

	<b>Right</b>		<b>Left</b>	
	<b>Patency</b>	<b>Competency</b>	<b>Patency</b>	<b>Competency</b>
<b>Deep Veins</b>				
Common Iliac Vein	Not Assessed		Not Assessed	
External Iliac Vein	Not Assessed		Not Assessed	
Internal Iliac Vein	Not Assessed		Not Assessed	
Common Femoral Vein	Widely Patent	Competent	Widely Patent	Competent
Profunda Vein	Widely Patent	Competent	Widely Patent	Competent
Superficial Femoral Vein	Widely Patent	Competent	Widely Patent	Competent
Popliteal Vein	Widely Patent	Competent	Widely Patent	Competent
Posterior Tibial Vein	Widely Patent	Competent	Widely Patent	Competent
Anterior Tibial Vein	Widely Patent	Competent	Widely Patent	Competent
Peroneal Vein	Widely Patent	Competent	Widely Patent	Competent
Soleal Vein	Patent		Patent	
Gastrocnemius	Patent		Patent	
<b>Superficial Veins</b>				
Saphenofemoral Junction	Patent	Incompetent	Patent	Competent
L Saphenous Vein Above	Patent	Competent	Patent	Competent
L Saphenous Vein Below	Patent	Competent	Patent	Competent
Vein of Giacomini	Patent	Competent	Patent	Competent
Saphenopopliteal Junction	Not Identified		Patent	Incompetent
S Saphenous Vein	Patent	Competent	Patent	Competent
<b>Evidence of D.V.T.</b>				
Above the knee	No		No	
Popliteal	No		No	
Below the knee	No		No	

#### Notes

#### BILATERAL LOWER LIMB VENOUS DUPLEX ASSESSMENT

##### RIGHT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is incompetent. Long Saphenous vein (LSV) is competent along length. Anterior thigh vein (ATV) identified originating off the SFJ. ATV is incompetent and immediately leaves the fascia to form tortuous anterior thigh and calf varicosities.

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Sapheno-popliteal junction (SPJ) was not identified.

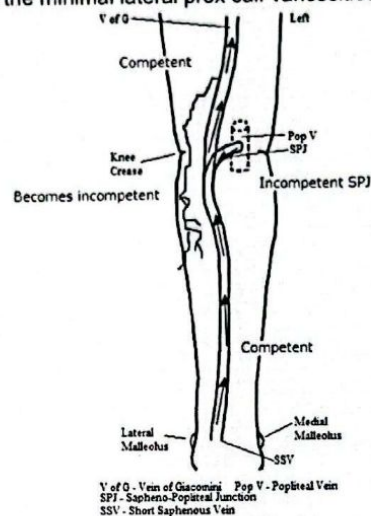
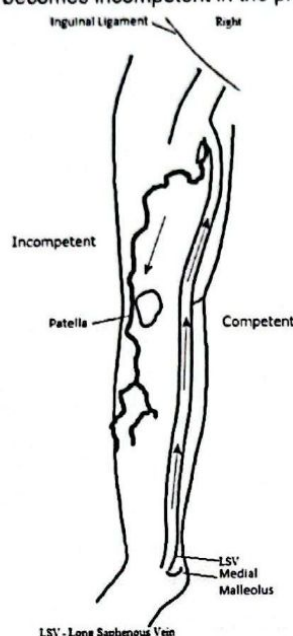
Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.

LEFT

RIGHT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is competent. Long Saphenous vein (LSV) is competent along length. Sapheno-popliteal junction (SPJ) is incompetent. Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini. Competent branch noted from the vein of Giacomini (distal thigh) that becomes incompetent in the prox calf and forms the minimal lateral prox calf varicosities.



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**Reason** Varicose vein  
**Outcome** DVT negative, Competent

	Right		Left	
	Patency	Competency	Patency	Competency
<b>Deep Veins</b>				
Common Iliac Vein			Not Assessed	
External Iliac Vein			Not Assessed	
Internal Iliac Vein			Not Assessed	
Common Femoral Vein			Widely Patent	Competent
Profunda Vein			Widely Patent	Competent
Superficial Femoral Vein			Widely Patent	Competent
Popliteal Vein			Widely Patent	Competent
Posterior Tibial Vein			Widely Patent	Competent
Anterior Tibial Vein			Widely Patent	Competent
Peroneal Vein			Widely Patent	Competent
Soleal Vein			Patent	
Gastrocnemius			Patent	
<b>Superficial Veins</b>				
Saphenofemoral Junction			Patent	Competent
L Saphenous Vein Above			Patent	Competent
L Saphenous Vein Below			Patent	Competent
Vein of Giacomini			Patent	Competent
Saphenopopliteal Junction			Not Identified	
S Saphenous Vein			Patent	Competent
<b>Evidence of D.V.T.</b>				
Above the knee			No	
Popliteal			No	
Below the knee			No	

#### Notes

##### LEFT LOWER LIMB VENOUS DUPLEX ASSESSMENT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

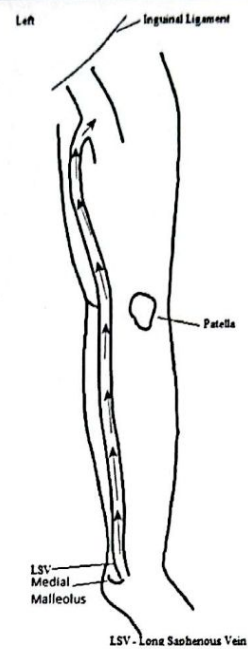
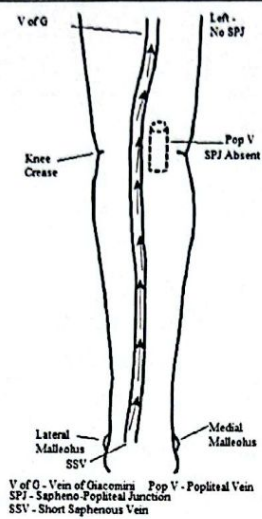
Sapheno-femoral junction (SFJ) is competent. Long Saphenous vein (LSV) is competent along length. Sapheno-popliteal junction (SPJ) was not identified. Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.

Assessed by Emily Davies, MCVS

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**Reason** Varicose vein  
**Outcome** DVT negative, Incompetence - Superficial

	Right		Left	
Deep Veins	Patency	Competency	Patency	Competency
Common Iliac Vein			Not Assessed	
External Iliac Vein			Not Assessed	
Internal Iliac Vein			Not Assessed	
Common Femoral Vein			Widely Patent	Competent
Profunda Vein			Widely Patent	Competent
Superficial Femoral Vein			Widely Patent	Competent
Popliteal Vein			Widely Patent	Competent
Posterior Tibial Vein			Patent	Competent
Anterior Tibial Vein			Patent	Competent
Peroneal Vein			Patent	Competent
Soleal Vein				
Gastrocnemius			Patent	
Superficial Veins				
Saphenofemoral Junction			Patent	Incompetent
L Saphenous Vein Above			Patent	Isolated Incompetence
L Saphenous Vein Below				
Vein of Giacomini			Patent	Competent
Saphenopopliteal Junction			Patent	Competent
S Saphenous Vein			Patent	Competent
Evidence of D.V.T.				
Above the knee			No	
Popliteal			No	
Below the knee			No	

#### Notes

#### LEFT LOWER LIMB VENOUS DUPLEX ASSESSMENT

\*All measurements are proximal to the medial malleolus unless otherwise stated.

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is incompetent. Incompetent anterior thigh vein (ATV) identified originating off the SFJ. ATV is linear for ~11cm before leaving the fascia and forming medial/ anterior thigh varicosities. Old non-occlusive superficial thrombophlebitis identified in the ATV and associated varicosities to the prox calf. Long Saphenous vein (LSV) is incompetent in the proximal thigh. Incompetent branch noted in the mid

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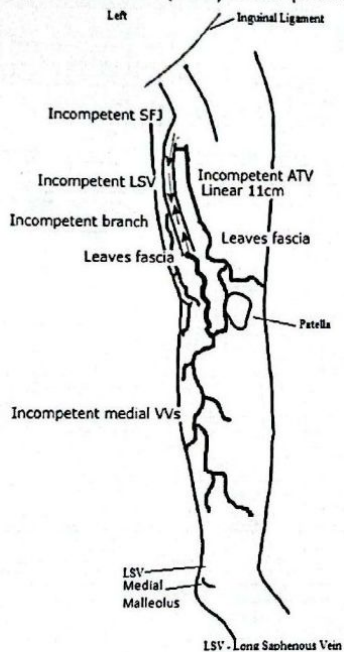
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thigh (34cm) forming medial thigh/ calf varicosities. LSV is competent distal to this branch before leaving the fascia (48cm) and communicating with calf varicosities. LSV does not return to the fascia in the calf.

Transverse (AP) dimensions of ATV:  
Proximal thigh - 0.95cm

Transverse (AP) dimensions of LSV:  
Proximal thigh - 0.36cm  
Mid thigh - 0.42cm

Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.



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**Reason** Varicose vein  
**Outcome** DVT negative, Incompetence - Superficial

	Right		Left	
Deep Veins	Patency	Competency	Patency	Competency
Common Iliac Vein	Not Assessed			
External Iliac Vein	Not Assessed			
Internal Iliac Vein	Not Assessed			
Common Femoral Vein	Widely Patent	Competent		
Profunda Vein	Widely Patent	Competent		
Superficial Femoral Vein	Widely Patent	Competent		
Popliteal Vein	Widely Patent	Competent		
Posterior Tibial Vein	Widely Patent	Competent		
Anterior Tibial Vein	Widely Patent	Competent		
Peroneal Vein	Widely Patent	Competent		
Soleal Vein	Widely Patent			
Gastrocnemius	Widely Patent			
Superficial Veins				
Saphenofemoral Junction	Patent	Incompetent		
L Saphenous Vein Above	Patent	Competent		
L Saphenous Vein Below	Patent	Competent		
Vein of Giacomini	Not Identified			
Saphenopopliteal Junction	Patent	Competent		
S Saphenous Vein	Patent	Competent		
Evidence of D.V.T.				
Above the knee	No			
Popliteal	No			
Below the knee	No			

## Notes

### RIGHT LOWER LIMB VENOUS DUPLEX ASSESSMENT

\*All measurements are proximal to the medial malleolus unless otherwise stated.

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is incompetent. Long Saphenous vein (LSV) is competent along length. Anterior thigh vein (ATV) identified originating from the SFJ. Dilation identified just distal to the SFJ (1.34cm) and is then tortuous in the fascia. Leaves the fascia in the prox thigh (11cm distal to the SFJ and 77cm prox MM).

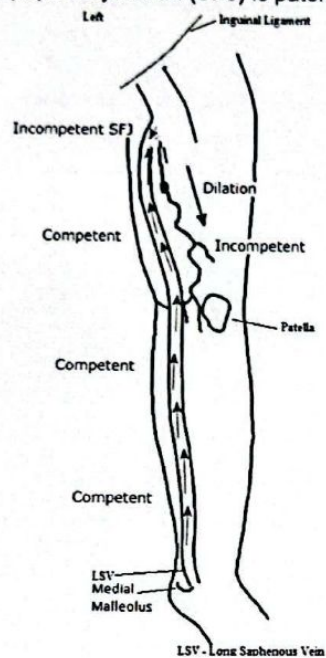
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Sapheno-popliteal junction (SPJ) is patent and competent. Short saphenous vein (SSV) is competent.



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<b>Reason</b>	Varicose vein
<b>Outcome</b>	DVT negative, Incompetence - Superficial

	<b>Right</b>		<b>Left</b>	
	<b>Patency</b>	<b>Competency</b>	<b>Patency</b>	<b>Competency</b>
<b>Deep Veins</b>				
Common Iliac Vein			Not Assessed	
External Iliac Vein			Not Assessed	
Internal Iliac Vein			Not Assessed	
Common Femoral Vein			Widely Patent	Competent
Profunda Vein			Widely Patent	Competent
Superficial Femoral Vein			Widely Patent	Competent
Popliteal Vein			Widely Patent	Competent
Posterior Tibial Vein			Widely Patent	Competent
Anterior Tibial Vein			Widely Patent	Competent
Peroneal Vein			Widely Patent	Competent
Soleal Vein			Patent	
Gastrocnemius			Patent	
<b>Superficial Veins</b>				
Saphenofemoral Junction			Patent	Incompetent
L Saphenous Vein Above			Patent	Isolated Incompetence
L Saphenous Vein Below			Patent	Competent
Vein of Giacomini			Patent	Competent
Saphenopopliteal Junction			Not Identified	
S Saphenous Vein			Patent	Competent
<b>Evidence of D.V.T.</b>				
Above the knee			No	
Popliteal			No	
Below the knee			No	

## Notes

### LEFT LOWER LIMB VENOUS DUPLEX ASSESSMENT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is Incompetent. Long Saphenous vein (LSV) is incompetent distal to the junction for a short section before an incompetent branch is noted that forms the extensive anterior thigh and anterior/lateral calf varicosities. LSV is competent distal to this branch.

Sapheno-popliteal junction (SPJ) was not identified. Short Saphenous vein (SSV) is competent and is

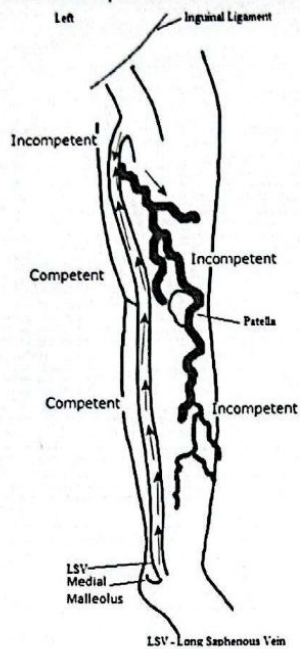
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continuous with a competent vein of Giacomini.



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**Reason** Varicose vein  
**Outcome** DVT negative, Competent

	Right		Left	
Deep Veins	Patency	Competency	Patency	Competency
Common Iliac Vein			Not Assessed	
External Iliac Vein			Not Assessed	
Internal Iliac Vein			Not Assessed	
Common Femoral Vein			Widely Patent	Competent
Profunda Vein			Widely Patent	Competent
Superficial Femoral Vein			Widely Patent	Competent
Popliteal Vein			Widely Patent	Competent
Posterior Tibial Vein			Widely Patent	Competent
Anterior Tibial Vein			Widely Patent	Competent
Peroneal Vein			Widely Patent	Competent
Soleal Vein			Widely Patent	
Gastrocnemius			Widely Patent	
Superficial Veins				
Saphenofemoral Junction			Patent	Competent
L Saphenous Vein Above			Patent	Competent
L Saphenous Vein Below			Patent	Competent
Vein of Giacomini			Patent	Competent
Saphenopopliteal Junction				
S Saphenous Vein			Patent	Competent
Evidence of D.V.T.				
Above the knee			No	
Popliteal			No	
Below the knee			No	

#### Notes

##### LEFT LOWER LIMB VENOUS DUPLEX ASSESSMENT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is competent. Long Saphenous vein (LSV) is competent along length

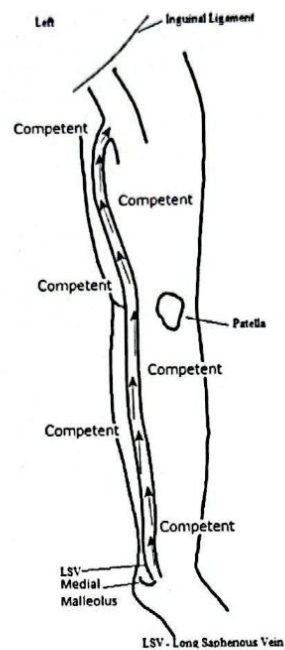
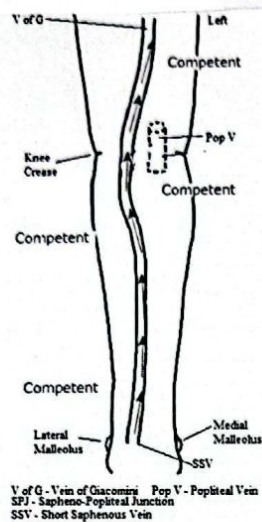
Sapheno-popliteal junction (SPJ) was not identified. Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.

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**Reason** Varicose vein  
**Outcome** DVT negative, Incompetence - Deep , Incompetence - Superficial

	Right		Left	
	Patency	Competency	Patency	Competency
<b>Deep Veins</b>				
Common Iliac Vein			Not Assessed	
External Iliac Vein			Not Assessed	
Internal Iliac Vein			Not Assessed	
Common Femoral Vein			Widely Patent	Competent
Profunda Vein			Widely Patent	Competent
Superficial Femoral Vein			Widely Patent	Competent
Popliteal Vein			Widely Patent	Isolated Incompetence
Posterior Tibial Vein			Widely Patent	Competent
Anterior Tibial Vein			Widely Patent	Competent
Peroneal Vein			Widely Patent	Competent
Soleal Vein			Patent	
Gastrocnemius			Patent	
<b>Superficial Veins</b>				
Saphenofemoral Junction			Not Identified	
L Saphenous Vein Above			Patent	Incompetent
L Saphenous Vein Below			Patent	Incompetent
Vein of Giacomini			Patent	Competent
Saphenopopliteal Junction			Patent	Incompetent
S Saphenous Vein			Patent	Incompetent
<b>Evidence of D.V.T.</b>				
Above the knee			No	
Popliteal			No	
Below the knee			No	

#### Notes

#### LEFT LOWER LIMB VENOUS DUPLEX ASSESSMENT

\*All measurements are proximal to the medial malleolus unless otherwise stated.

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT apart from isolated incompetence noted in the popliteal vein

The sapheno-femoral junction (SFJ) was not identified ?previous VV surgery. Small calibre, highly tortuous veins identified in the groin ?neovascularisation. LSV appears to reform from this neovascularisation in the very prox thigh. Long Saphenous vein (LSV) is incompetent in the prox to mid thigh. Incompetent branch

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noted in the mid thigh (57cm and 21cm distal to the SFJ) forming anterior thigh varicosities. Another incompetent branch noted in the mid thigh (51cm) forming medial thigh and calf varicosities. LSV is competent distal to this branch. Incompetent communication with varicosities identified in the prox calf (35cm) causing the LSV to become incompetent. LSV then leaves the fascia in the mid calf (30cm) forming medial calf varicosities.

**Transverse (AP) dimensions of LSV:**

Proximal thigh - 0.24cm

Mid thigh - 0.37cm

Distal thigh - 0.28cm

Proximal calf - 0.57cm

Mid calf - 0.40cm

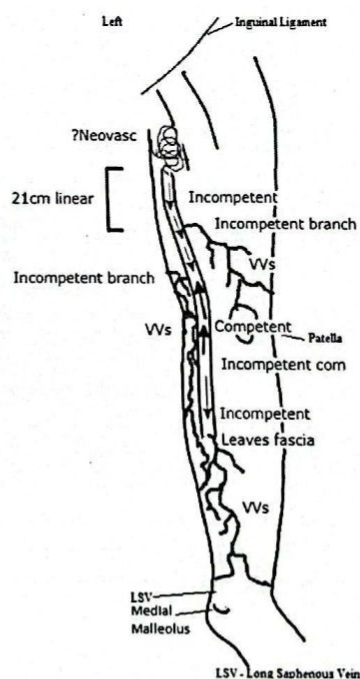
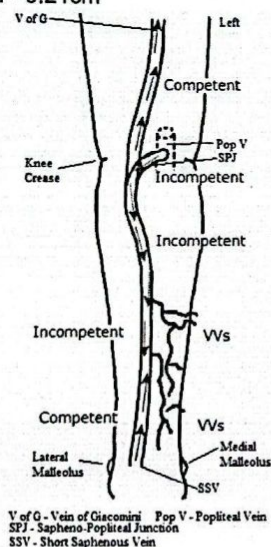
Sapheno-popliteal junction (SPJ) is patent and incompetent. Short Saphenous vein (SSV) is incompetent and is continuous with a competent vein of Giacomini. Two incompetent branches noted in the mid calf (27cm and 24cm) forming medial and anterior calf varicosities. SSV is competent distal to the second branch.

**Transverse (AP) dimensions of SSV:**

Proximal calf - 0.50cm

Mid calf - 0.41cm

Distal calf - 0.21cm



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**Reason** Varicose vein  
**Outcome** DVT negative, Incompetence - Superficial

	Right		Left	
	Patency	Competency	Patency	Competency
<b>Deep Veins</b>				
Common Iliac Vein			Not Assessed	
External Iliac Vein			Not Assessed	
Internal Iliac Vein			Not Assessed	
Common Femoral Vein			Widely Patent	
Profunda Vein			Widely Patent	
Superficial Femoral Vein			Widely Patent	
Popliteal Vein			Widely Patent	
Posterior Tibial Vein			Patent	
Anterior Tibial Vein			Patent	
Peroneal Vein			Patent	
Soleal Vein				
Gastrocnemius			Patent	
<b>Superficial Veins</b>				
Saphenofemoral Junction			See notes	
L Saphenous Vein Above			See notes	
L Saphenous Vein Below			See notes	
Vein of Giacomini			Patent	Competent
Saphenopopliteal Junction			Not Identified	
S Saphenous Vein			Patent	Competent
<b>Evidence of D.V.T.</b>				
Above the knee			No	
Popliteal			No	
Below the knee			No	

### Notes

#### LEFT LOWER LIMB VENOUS DUPLEX ASSESSMENT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) not identified ?previous VV surgery. Long Saphenous vein (LSV) is not identified in the prox thigh ?previous VV surgery. The LSV reforms in the mid thigh (56cm) and is small calibre and competent. Small calibre incompetent and proximally tracking vein (?source) communicates with the LSV and makes it incompetent in the mid thigh (53cm). LSV leaves the fascia in the mid thigh (51cm) and forms anterior/ medial thigh and calf varicosities.

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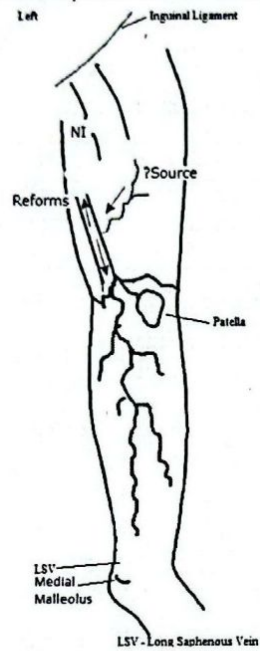
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Transverse (AP) dimensions of LSV:  
Mid thigh - 0.23cm

Sapheno-popliteal junction (SPJ) was not identified. Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.



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Reason Varicose vein  
Outcome DVT negative, Incompetence - Superficial

Deep Veins	Right		Left	
	Patency	Competency	Patency	Competency
Common Iliac Vein	Not Assessed			
External Iliac Vein	Not Assessed			
Internal Iliac Vein	Not Assessed			
Common Femoral Vein	Widely Patent	Competent		
Profunda Vein	Widely Patent	Competent		
Superficial Femoral Vein	Widely Patent	Competent		
Popliteal Vein	Widely Patent	Competent		
Posterior Tibial Vein	Widely Patent	Competent		
Anterior Tibial Vein	Widely Patent	Competent		
Peroneal Vein	Widely Patent	Competent		
Soleal Vein	Patent			
Gastrocnemius	Patent			
Superficial Veins				
Saphenofemoral Junction	Patent	Competent		
L Saphenous Vein Above	Patent	Isolated Incompetence		
L Saphenous Vein Below	Patent	Incompetent		
Vein of Giacomini	Patent	Competent		
Saphenopopliteal Junction				
S Saphenous Vein	Patent	Competent		
Evidence of D.V.T.				
Above the knee	No			
Popliteal	No			
Below the knee	No			

#### Notes

##### RIGHT LOWER LIMB VENOUS DUPLEX ASSESSMENT

\*All measurements are proximal to the medial malleolus unless otherwise stated.

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is competent. Long Saphenous vein (LSV) is competent and linear in the prox thigh. Incompetent perforator noted in the prox/ mid thigh (67cm and 13cm distal to the SFJ). LSV is incompetent distal to this until it leaves the fascia in the mid thigh (64cm) forming medial thigh and calf varicosities. LSV reforms via competent perforator in the mid calf (19cm). Incompetent communication with

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Transverse (AP) dimensions of LSV:  
Proximal thigh - 0.49cm  
Distal calf - 0.31cm

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**Reason** Varicose vein  
**Outcome** DVT negative, Incompetence - Superficial

	Right		Left	
	Patency	Competency	Patency	Competency
<b>Deep Veins</b>				
Common Iliac Vein	Not Assessed		Not Assessed	
External Iliac Vein	Not Assessed		Not Assessed	
Internal Iliac Vein	Not Assessed		Not Assessed	
Common Femoral Vein	Widely Patent	Competent	Widely Patent	Competent
Profunda Vein	Widely Patent	Competent	Widely Patent	Competent
Superficial Femoral Vein	Widely Patent	Competent	Widely Patent	Competent
Popliteal Vein	Widely Patent	Competent	Widely Patent	Competent
Posterior Tibial Vein	Widely Patent	Competent	Widely Patent	Competent
Anterior Tibial Vein	Widely Patent	Competent	Widely Patent	Competent
Peroneal Vein	Widely Patent	Competent	Widely Patent	Competent
Soleal Vein	Patent		Patent	
Gastrocnemius	Patent		Patent	
<b>Superficial Veins</b>				
Saphenofemoral Junction	Patent	Incompetent	Patent	Incompetent
L Saphenous Vein Above	Patent	Incompetent	Patent	Incompetent
L Saphenous Vein Below	Patent	Incompetent	Patent	Incompetent
Vein of Giacomini	Patent	Competent	Patent	Competent
Saphenopopliteal Junction	Not Identified		Not Identified	
S Saphenous Vein	Patent	Competent	Patent	Competent
<b>Evidence of D.V.T.</b>				
Above the knee	No		No	
Popliteal	No		No	
Below the knee	No		No	

## Notes

### BILATERAL LOWER LIMB VENOUS DUPLEX ASSESSMENT

\*All measurements are proximal to the medial malleolus unless otherwise stated.

#### RIGHT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is incompetent. Long Saphenous vein (LSV) is incompetent and linear in the thigh. Two incompetent branches identified in the prox calf (36cm) forming medial and posterior calf varicosities. LSV is competent distal to this branch.

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Transverse (AP) dimensions of LSV:

Proximal thigh - 0.67cm  
Mid thigh - 0.68cm  
Distal thigh - 0.74cm  
Proximal calf - 0.81cm  
Mid calf - 0.17cm  
Distal calf - 0.33cm

Sapheno-popliteal junction (SPJ) was not identified. Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.

LEFT

Iliac veins not viewed. Flow in the common femoral vein is phasic with respiration and responds normally to a Valsalva manoeuvre, suggesting proximal vein patency. All visualised deep veins appear widely patent and competent with no evidence of previous DVT.

Sapheno-femoral junction (SFJ) is incompetent. Long Saphenous vein (LSV) is incompetent and linear in the prox to mid thigh. Incompetent branch noted in the mid calf (60cm) forming anterior thigh varicosities. LSV is slightly incompetent distal to this branch. Incompetent communication with varicosities noted in the distal thigh (52cm). LSV becomes incompetent again. Incompetent branch noted in the mid calf (38cm) forming medial calf varicosities. LSV is competent distal to this branch. Incompetent communication noted in the distal calf (30cm) with a competent perforator also noted at this point so LSV remains competent.

Transverse (AP) dimensions of LSV:

Proximal thigh - 0.74cm  
Mid thigh - 0.71cm  
Distal thigh - 0.83cm  
Proximal calf - 0.80cm  
Mid calf - 0.18cm  
Distal calf - 0.13cm

Sapheno-popliteal junction (SPJ) was not identified. Short Saphenous vein (SSV) is competent and is continuous with a competent vein of Giacomini.

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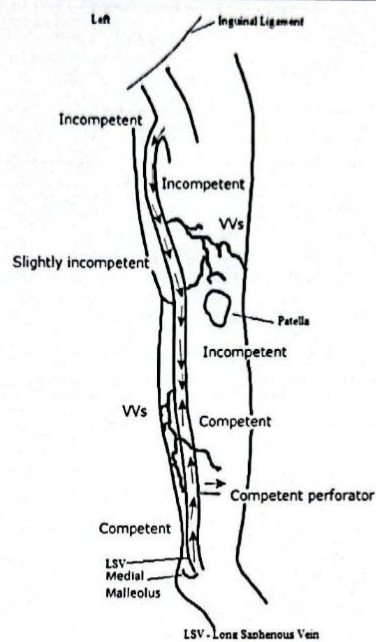
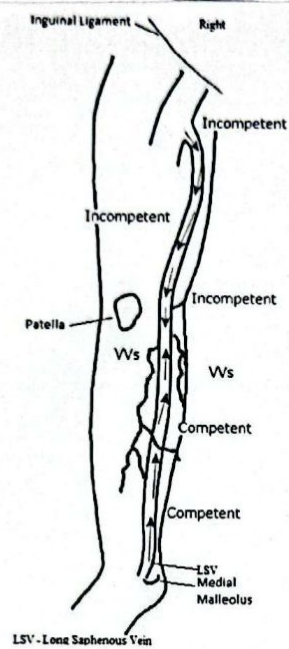
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