**Image Protocol – PACS**

Change History:

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| 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 |

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| 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)**

Vascular Image Protocol for PACS

All images must be labelled with anatomy and orientation.

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 images should be recorded and appropriately labelled.

1. **Carotid** –
   1. 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.
5. **Lower limb venous DVT-**
   1. Right/left leg - CFV including Valsalva, PFV, SFV origin and distal, Popliteal. Only take image in the calf if DVT identified or differential diagnosis eg. Muscle tear, Baker’s cyst, superficial oedema or thrombo-phlebitus. 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 veins’s –** 
   1. Right and left legs
      1. Follow deep venous protocol as above
      2. Superficial junctions demonstrating incompetence.
      3. Sections of LSV in thigh and calf demonstrating incompetence and TS images showing diameters for VNUS suitability if required
      4. Section of SSV in mid calf demonstrating incompetence and TS images showing diameters for VNUS suitability if required
7. **Vein mapping for bypass conduit**:
   1. 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.

* 1. If Unsuitable vein: one image showing reason for non-suitability eg. Varicose, superficial thrombo-phlebitis.
  2. 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.

1. **Transvaginal Duplex Ultrasound for pelvic vein reflux** –
   1. 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.
2. **AVP** – no images taken
3. **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

**Additional UHSM protocol**:

* 1. Recordings of a 5 second cine-loop of every AAA/EVAR in transverse should be taken where aorta is at its maximum diameter.

1. **Visceral assessment** –
   1. Proximal abdominal aorta LS with waveform demonstrating any disease.
   2. Coeliac axis(where possible) with colour. demonstrating any disease
   3. Hepatic and splenic arteries – colourflow and spectral waveforms demonstrating any disease
   4. SMA- Colour image and with spectral waveform, SMA diameter, demonstrating any disease
   5. IMA – if identified, colour image and spectral waveforms, demonstrating any disease
2. **Upper limb arterial** – VA direction, subclavian, axillary, brachial, brachial bifurcation, radial and ulnar waveforms at wrist with colour and waveforms.
3. **Upper limb venous** – IJV, subclavian vein, axillary vein, brachial veins, cephalic and basilic veins – waveform to demonstrate phasicity.
4. **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.
5. **DIEP** – Each epigastric perforator at point it crosses the fascia with AP diameter measurement in longitudinal. Each perforator labelled by number.