

## **Vascular CT Protocols**

V 1D: Chest and abdominal CT angiogram (aortic dissection protocol)

V 1T: Chest CT angiogram (aortic trauma protocol)

V 2: Abdominal and pelvis CT angiogram (aortic aneurysm protocol)

V 2S: Abdominal and pelvis CT angiogram (aortic stent graft followup)

V 3: Abdominal aorta and bilateral iliofemoral lower extremity runoff CT angiogram

V 4: Upper extremity CT angiogram

V 5: Abdominal CT angiogram

V6: Abdominal and pelvis CT angiogram (breast reconstruction surgery protocol)

V7: CT Venogram

## **V 1D: Chest and abdominal CT angiogram (aortic dissection protocol)**

Indications: chest pain, differences in upper extremity blood pressures.

Contrast parameters	1) None 2) 125mL @ 4 mL/sec; OR 100 mL @ 4 mL/sec, with 30 mL saline flush
Region of scan	Lung apices to iliac crests
Scan delay	1) NA 2) Care Bolus at diaphragmatic aorta; peak + 5 sec
Detector collimation	1) 16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm 2) 16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm
Slice thickness	1) 5 mm axials 2) 3 mm axials. 3 mm 3-D MIP oblique sagittal and coronal reformats, and/or 3-D VRT reformats
Filming	B30f kernel B70f kernel (lung bases)

### Comments:

- Siemens ThorAngioVol package

## **V 1T: Chest CT angiogram (aortic trauma protocol)**

Indications: blunt chest trauma, abnormal CXR.

Contrast parameters	125mL @ 4 mL/sec; OR 100 mL @ 4 mL/sec, with 30 mL saline flush
Region of scan	Lung apices to posterior lung bases
Scan delay	20 mL Care Bolus at diaphragmatic aorta; peak + 3 sec
Detector collimation	16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm
Slice thickness	3 mm axials; 3 mm 3-D MIP oblique sagittal reformats through aortic arch, and/or 3-D VRT reformats
Filming	B30f kernel B70f kernel for lung bases

Comments:

- Siemens ThorAngioVol package

## **V 2: Abdominal and pelvis CT angiogram (aortic aneurysm protocol)**

Indications: characterize aortic abdominal aneurysms prior to planned repair.

Contrast parameters	125mL at 4mL/sec; OR 100 mL @ 4 mL/sec, with 30 mL saline flush
Region of scan	Diaphragm to symphysis
Scan delay	Care Bolus at mid-aorta (not in aneurysm); peak + 5 sec
Detector collimation	16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm
Slice thickness	3 mm axials; 3 mm 3-D coronal/sagittal MIP and/or VRT reformats
Filming	B30f kernel B70f kernel for lung bases

### Comments:

- Siemens BodyAngioRoutine or BodyAngioFast package
- For unstable patients with suspected ruptured AAA, perform protocol A4 instead (no IV contrast).
- Region of scan can vary, depending on superior extent of aneurysm.

## **V2S: Abdominal and pelvis CT angiogram (aortic stent graft followup)**

Indications: assess for endoleaks after AAA stent graft placement.

Contrast parameters	1) None 2) 125mL at 4 mL/sec; OR 100 mL @ 4 mL/sec, with 30 mL saline flush
Region of scan	Diaphragm to symphysis
Scan delay	1) NA 2) Care Bolus at mid-aorta; peak minus 1 sec 3) 120 seconds
Detector collimation	16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm
Slice thickness	1) 3 mm axials 2) 3 mm axials; 3 mm 3-D sagittal/coronal MIP and/or VRT reformats. 3) 3 mm axials
Filming	B30f kernel B70f kernel for lung bases

### Comments:

- Siemens BodyAngioRoutine or BodyAngioFast package

### **V 3: Abdominal aorta and bilateral iliofemoral lower extremity runoff CT angiogram**

Indications: peripheral vascular disease, claudication.

Contrast parameters	5-6 mL/sec for 5 sec, then by 3-4mL/sec for 40 sec. OR 5-6 mL/sec for 5 sec, then 3-4mL/sec for 30 sec, followed by 30 mL saline flush
Region of scan	1) T12 to feet; position patient feet-first and supine 2) Perform extra immediate delay of distal lower extremities (knees to toes). Helpful if contrast bolus is off from slow circulation
Scan delay	Care Bolus at mid-aorta; peak + 0 sec
Detector collimation	16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm
Slice thickness	5 mm and 2 mm axials from T12 to feet 1 mm coronal & sagittal 3-D MIP, and/or 3-D VRT reformats both with and without adjacent bony structures.
Filming	B30f kernel

Comments:

- Siemens AngioRunoff package
- Increase injection rates for patients > 90 kg.

## **V 4: Upper extremity CT angiogram**

Indications: acute ischemia.

Contrast parameters	5mL/sec for 5 sec, then 3 mL/sec for 30 sec. OR 5 mL/sec for 5 sec, then 3 mL/sec for 25 sec, then 30 mL saline flush
Region of scan	1) Aortic arch to fingertips (symptomatic side only); place arm overhead if possible. 2) Optional delays: elbow to fingers
Scan delay	Care Bolus at aortic arch; peak + 0 sec
Detector collimation	16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm
Slice thickness	2 and 5 mm axials 1 mm 3-D coronal & sagittal MIP, and/or 3-D VRT reformats with and without bony structures.
Filming	B30f kernel

Comments:

- Siemens AngioRunoff package
- Perform optional delayed sequence if there is inadequate distal upper extremity contrast opacification on initial scans.

## **V 5: Abdominal CT angiogram**

Indications: renovascular hypertension, mesenteric ischemia.

Contrast parameters	125mL@ 4 mL/sec; OR 100 mL @ 4 mL/sec, followed by 30 mL saline flush
Region of scan	Diaphragm to iliac crests
Scan delay	Care Bolus at mid-aorta; peak + 0 sec
Detector collimation	16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm
Slice thickness	5 mm and 2 mm axials 1 mm 3-D coronal and sagittal MIP, and/or 3-D VRT reformats.
Filming	B30f kernel B70f kernel for lung bases.

Comments:

- Siemens BodyAngioRoutine package
- Perform coronal MPR for renal artery evaluation; sagittal MPR for mesenteric artery evaluation.



## **V6: Abdomen and pelvis CT angiogram (breast reconstruction surgery protocol)**

Indications: planning for reconstructive breast surgery.

Contrast parameters	125 mL @ 4mL/sec; OR 100 mL @ 4mL/sec, followed by 30 mL saline flush
Region of scan	Lesser femoral trochanters to diaphragm (bottom to top).
Scan delay	Care Bolus at level of acetabulum, ROI in right external iliac artery; peak + 7 sec
Detector collimation	16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm
Slice thickness	5 mm and 1.0 mm axials 1.0 mm 3-D coronal and sagittal MIP through anterior abdominal wall, and 3-D VRT skin surface reformats.
Filming	B20 smooth kernel

Comments:

- 3 mm beam collimation; 120 kVp, 200 mA; pitch 1.15, rotation time 0.5 s.

## **V7: CT Venogram**

Bolus of IV contrast at 3 cc/sec, 150 mL (or 2 mL/kg BW)

Empiric delay in scanning time depending on the area of interests:

Thoracic:	60-90 seconds
UE:	70-80 seconds
Abd/Pelvis:	110 seconds
LE :	180 seconds