

IV Contrast Injection Protocols

CTA of the Thorax for Pulmonary Embolus

For CTA of the pulmonary arteries (suspected PE) a uniphasic injection protocol is used. The coverage length of the exam is approximately 25-30 cm. The scanning protocols were written to complete the examination within 2-5 seconds with the high resolution detector configurations (0.6mm or 0.625mm raw data slice thickness). The injection rate is 4-6 mL per second adjusted for body weight. The injection duration is matched to the scan time (approximately 5 seconds or less).

64-Row Scanners (Detector Length approximately 40mm)

GE VCT / Optima 64 and Siemens Edge / AS / Perspective 128

32-Row Scanners (Detector Length approximately 20mm)

GE Optima 32 and Siemens Edge / AS / Perspective 64

Patient Weight	55 KG or less	55 to 90 KG	Over 90 KG
Contrast Phase 1 Rate	4 mL/sec	5 mL/sec	6 mL/sec
Contrast Phase 1 Time	10 sec	10 sec	10 sec
Contrast Phase 1 Volume	40 mL	50 mL	60 mL

Saline Phase 2 Rate	3 mL/sec	3 mL/sec	3 mL/sec
Saline Phase 2 Time	15 sec	15 sec	15 sec
Saline Phase 2 Volume	45 mL	45 mL	45 mL

The appropriate delay between initiation of the contrast injection and pulmonary arterial phase scanning should be timed using either automatic triggering or a timing bolus. If automatic triggering is used, then the trigger ROI should be in the main pulmonary artery. The trigger should be at 100 HU with a subsequent delay of 3 seconds for arterial phase CTA imaging. If a timing bolus is used to calculate the contrast medium transit time (CMTT) then the ROI should be in the main pulmonary artery. The arterial phase CTA acquisition should begin at the CMTT plus 3 seconds after the start of the injection. The IV should be in the right arm. Injection in to the left arm creates increased artifacts due to bright contrast in the left innominate vein. Scanning is caudal to cranial to minimize artifacts from the inflow veins and superior vena cava.

16-Row Scanners (Effective Detector Length 12-24mm)

Siemens Somatom 16, GE BrightSpeed 16

In order to obtain an isotropic thin-section data set the detector configuration on the Somatom 16 results in an effective detector length of 12mm. The detector configuration on the GE BrightSpeed 16 results in an effective detector length of 10mm. The scan time using these detector configurations will be 8-9 seconds. This requires a longer, higher volume contrast injection. Suspending respiration for this length of time will be more difficult for some patients. The coverage length of the exam is approximately 25-30 cm. The injection rate is 4-6 cc per second adjusted for body weight. The injection duration is matched to the scan time (approximately 10 seconds or less).

Patient Weight	55 KG or less	55 to 90 KG	Over 90 KG
Contrast Phase 1 Rate	4 mL/sec	5 mL/sec	6 mL/sec
Contrast Phase 1 Time	18 sec	18 sec	18 sec
Contrast Phase 1 Volume	72 mL	90 mL	108 mL

Saline Phase 2 Rate	3 mL/sec	3 mL/sec	3 mL/sec
Saline Phase 2 Time	15 sec	15 sec	15 sec
Saline Phase 2 Volume	45 mL	45 mL	45 mL

The appropriate delay between initiation of the contrast injection and pulmonary arterial phase scanning should be timed using either automatic triggering or a timing bolus. If automatic triggering is used, then the trigger ROI should be in the main pulmonary artery. The trigger should be at 100 HU with a subsequent delay of 3 seconds for arterial phase CTA imaging. If a timing bolus is used to calculate the contrast medium transit time (CMTT) then the ROI should be in the main pulmonary artery. The arterial phase CTA acquisition should begin at the CMTT plus 3 seconds after the start of the injection. The IV should be in the right arm. Injection in to the left arm creates increased artifacts due to bright contrast in the left innominate vein. Scanning is caudal to cranial to minimize artifacts from the inflow veins and superior vena cava.