

Austin Radiological Association

CTA Protocols

Questions?

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IV CATHETER GUIDELINES

The power injection rate will be determined by the IV catheter type, size, and the exam to be performed

Catheter	Injection Rate	PSI
<u>BD Nexiva Diffusics</u>		
24g	<u>Less than or equal to 2cc/sec</u>	<u>325</u>
22g	<u>Less than 4cc/sec</u>	<u>325</u>
20g	<u>Greater than 4cc/sec</u>	<u>325</u>
<u>B Braun Safety Introcan</u>		
24g	<u>HAND INJECTION ONLY</u>	
22g	Less than or equal to 2cc/sec	300
20g	Less than or equal to 4cc/sec	300
18g	Less than or equal to 6cc/sec	300
<u>B Braun Safety 3 Introcan</u>		
24g	Less than or equal to 2.5cc/sec	325
22g	Less than or equal to 3.5cc/sec	325
20g	Less than or equal to 4cc/sec	325
18g	Less than or equal to 5cc/sec	325

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PATIENT POSITIONING

- Both arms should be raised above the head for optimal image quality
- If the patient cannot raise one arm, one arm down is preferred to both arms down and this information should be documented in tech notes for the radiologist
- If both arms are unable to be raised, this information should be documented in tech notes for the radiologist

CTDI: ≤ 25 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from above the diaphragm through the through the entire pelvis

DFOV: Patient's width plus 4cm

Scan Range: Above the diaphragm through the entire pelvis

Scan Parameters:

- Non-contrast
- Bolus Tracking/Smart Prep scan trigger is set at 120 HU in the descending aorta at the level of the scan start
- Arterial Phase ([See IV Catheter Guidelines](#))
 - Injection rate of 4.5ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist followed by 50ml normal saline @ 4.5 ml/sec
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval
- Venous Phase obtained 1 minute after the arterial
 - 3 minute delay scan will be performed through the aortic graft when a patient presents for a post graft repair evaluation

PACS series in order as performed:

- Topogram
- 2x2 Non-Contrast
- 2x2 Arterial Axial
- 10x2 Thin MIP Coronal/Sagittal
- 2x2 Coronal/Sagittal MPR
- MIP/VRT Rotations (3D)
- 2x2 Venous Axial
- 2x2 Post Graft 3min Delay (if obtained)
- Patient Protocol/Dose Report

≤99lbs	44kg	1 cc/lb or 2cc/kg
100-210lbs	45-95kg	100ml
211-290lbs	96-130kg	125ml
≥291lbs	≥131kg	150ml

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ABDOMEN PELVIS CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 1.2	16 x 1.2	64 x 0.6	Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.6	0.5	Rotation Time (sec)	0.5
Pitch	0.6	0.8	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	39.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	90	90	90	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	0%
Non Contrast					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth		
Window	Abdomen	Abdomen	Abdomen	Recon 1 Non Con	
SAFIRE/ADMIRE	1	2	2	Algorithm	Standard
Slice Thickness (mm)	2	2	2	Window Width/ Level	400/40
Slice Increment (mm)	2	2	2	Slice Thickness (mm)	2.5
Arterial/Venous					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth	Slice Increment (mm)	2.5
Window	Abdomen	Abdomen	Abdomen	Type	Full
SAFIRE/ADMIRE	2	2	2	ASIR	SS20
Slice Thickness (mm)	2	2	2		
Slice Increment (mm)	2	2	2	Recon Arterial/Venous	
Reformat					
Kernel	I30s Med Smooth	I41s Medium	I30f Med Smooth	Algorithm	Standard
Window	CT Angio	Abdomen	Abdomen	Window Width/ Level	400/40
SAFIRE/ADMIRE	2	2	2	Slice Thickness (mm)	2.5
Slice Thickness (mm)	1.5	0.75	0.75	Slice Increment (mm)	2.5
Slice Increment (mm)	0.7	0.5	0.5	Type	Full
Cor/Sag MIP					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth	ASIR	SS20
Window	CT Angio	Mediastinum	Abdomen	Recon Reformat	
SAFIRE/ADMIRE	2	2	2	Algorithm	Standard
Slice Thickness (mm)	10	10	10	Window Width/ Level	450/35
Slice Increment (mm)	2	2	2	Slice Thickness (mm)	1.25
Cor/Sag MPR					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth	Slice Increment (mm)	0.625
Window	CT Angio	Abdomen	Abdomen	Type	Full
SAFIRE/ADMIRE	2	2	2	ASIR	SS20
Slice Thickness (mm)	2	2	2		
Slice Increment (mm)	2	2	2		

CTDI: ≤ 20 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from above the diaphragm through the through the SI joints

DFOV: Patient's width plus 4cm

Scan Range: Above the diaphragm through the aortic bifurcation

Scan Parameters:

- Non-contrast
- Bolus Tracking/Smart Prep scan trigger is set at 120 HU in the descending aorta at the level of the scan start
- Arterial Phase ([See IV Catheter Guidelines](#))
 - Injection rate of 4.5ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist followed by 50ml normal saline @ 4.5 ml/sec
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval
- Venous Phase obtained 1 minute after the arterial

PACS series in order as performed:

- Topogram
- 2x2 Non-Contrast
- 2x2 Arterial Axial
- 10x2 Thin MIP Coronal/Sagittal
- 2x2 Coronal/Sagittal MPR
- MIP/VRT Rotations (3D)
- 2x2 Venous Axial
- Patient Protocol/Dose Report

≤99lbs	44kg	1 cc/lb or 2cc/kg
100-210lbs	45-95kg	100ml
211-290lbs	96-130kg	125ml
≥291lbs	≥131kg	150ml

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ABDOMEN CTA PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 1.2	16 x 1.2	64 x 0.6	Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.6	0.5	Rotation Time (sec)	0.5
Pitch	0.6	0.8	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	39.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	90	90	90	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	0%
Non Contrast					
Kernel	I31s Med Smooth	I41f Medium	I41f Medium		
Window	Abdomen	Abdomen	Abdomen	Recon 1 Noncon	
SAFIRE/ADMIRE	2	2	2	Algorithm	Standard
Slice Thickness (mm)	2	2	2	Window Width/ Level	450/ 35
Slice Increment (mm)	2	2	2	Slice Thickness (mm)	2.5
Arterial/Venous					
Kernel	I31s Med Smooth	I41f Medium	I41f Medium	Slice Increment (mm)	2.5
Window	Abdomen	Abdomen	Abdomen	Type	Full
SAFIRE/ADMIRE	2	2	2	ASIR	SS20
Slice Thickness (mm)	2	2	2	Recon 2 Arterial/Venous	
Slice Increment (mm)	2	2	2	Algorithm	Standard
Reformat					
Kernel	I30s Med Smooth	I26f Med Smooth	I30f Med Smooth	Window Width/ Level	400/40
Window	CT Angio	Abdomen	Abdomen	Slice Thickness (mm)	2.5
SAFIRE/ADMIRE	2	3	2	Slice Increment (mm)	2.5
Slice Thickness (mm)	1.5	1.5	1	Type	Full
Slice Increment (mm)	0.7	0.8	0.7	ASIR	SS20
Cor/Sag MIP					
Kernel	I31s Med Smooth	I41f Medium	I41f Medium	Recon 2 Reformat	
Window	CT Angio	Mediastinum	Abdomen	Algorithm	Standard
SAFIRE/ADMIRE	2	2	2	Window Width/ Level	450/35
Slice Thickness (mm)	10	10	10	Slice Thickness (mm)	1.25
Slice Increment (mm)	2	2	2	Slice Increment (mm)	0.625
Cor/Sag MPR					
Kernel	I31s Med Smooth	I41f Medium	I41f Medium	Type	Full
Window	CT Angio	Abdomen	Abdomen	ASIR	SS20
SAFIRE/ADMIRE	2	2	2		
Slice Thickness (mm)	2	2	2		
Slice Increment (mm)	2	2	2		

CTDI: ≤ 20 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from above the diaphragm through the through toes

DFOV: Patient's width plus 4cm

Scan Parameters:

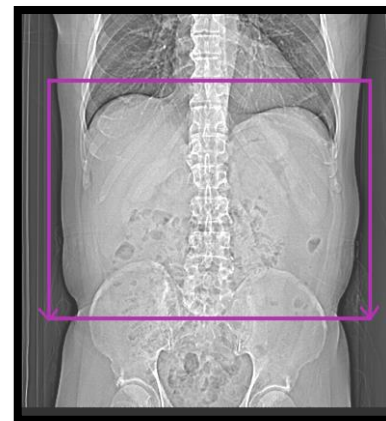
- Non-contrast above diaphragm through aortic bifurcation
- Bolus Tracking/Smart Prep scan trigger is set at 120 HU in the descending aorta at the level of the scan start
- Arterial Phase (see chart for IV contrast dosing) above diaphragm thru feet [\(See IV Catheter Guidelines\)](#)
 - Injection rate of 4.5ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist followed by 100ml normal saline @ 4.5 ml/sec
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval
- Venous Phase obtained 50 seconds after arterial above the diaphragm through the aortic bifurcation

≤99lbs	44kg	1 cc/lb or 2cc/kg
100-210lbs	45-95kg	100ml
211-290lbs	96-130kg	125ml
≥291lbs	≥131kg	150ml

PACS series in order as performed:

- Topogram
- 2x2 Non-Contrast
- 2x2 Arterial Axial
- 10x2 Thin MIP Coronal/Sagittal Abd/Pel, Upper/Lower Leg
- 2x2 Venous Axial
- MIP/VRT Rotations, Lower Leg Slabs (3D)
- Patient Protocol/Dose Report

Non-Contrast/Venous Range



Arterial Range



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ABDOMEN PELVIS with RUNOFF CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 1.2	16 x 1.2	64 x 0.6	Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.6	0.5	Rotation Time (sec)	0.8
Pitch	0.6	0.85	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	39.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	150	90	90	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Non Contrast					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth		
Window	Abdomen	Abdomen	Abdomen	Recon 1 Non Con	
SAFIRE/ADMIRE	2	2	2	Algorithm	Standard
Slice Thickness (mm)	2	2	2	Window Width/ Level	450/ 35
Slice Increment (mm)	2	2	2	Slice Thickness (mm)	2.5
Arterial					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth	Slice Increment (mm)	2.5
Window	Abdomen	Abdomen	Abdomen	Type	Full
SAFIRE/ADMIRE	2	2	2	ASIR	SS50
Slice Thickness (mm)	2	2	2	Recon 2 Arterial/Venous	
Slice Increment (mm)	2	2	2	Algorithm	Soft
Reformat					
Kernel	B10s Very Smooth	I26f Med Smooth	I26f Med Smooth	Window Width/ Level	700/80
Window	CT Angio	Abdomen	Abdomen	Slice Thickness (mm)	2.5
SAFIRE/ADMIRE	0	2	2	Slice Increment (mm)	2.5
Slice Thickness (mm)	1.5	1.5	1.5	Type	Full
Slice Increment (mm)	0.7	0.8	0.7	ASIR	SS20
Cor/Sag MIP					
Kernel	I31s Med Smooth	I41f Medium	I41f Medium	Recon 3 Reformat	
Window	CT Angio	Mediastinum	Abdomen	Algorithm	Soft
SAFIRE/ADMIRE	2	2	2	Window Width/ Level	700/80
Slice Thickness (mm)	10	10	10	Slice Thickness (mm)	1.25
Slice Increment (mm)	2	2	2	Slice Increment (mm)	0.625
Venous					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth	Type	Full
Window	Abdomen	Abdomen	Abdomen	ASIR	SS20
SAFIRE/ADMIRE	2	2	2		
Slice Thickness (mm)	2	2	2		
Slice Increment (mm)	2	2	2		

CTDI: ≤ 20 mGy per acquisition

See [Oral Contrast Guidelines](#) and [Patient Positioning](#) for additional information

Setup: Scout PA/Lateral from above the diaphragm through the through mid calf

DFOV: Patient's width plus 4cm

Scan Parameters:

- Scan from just above the diaphragm through the popliteal veins (just below the tibial plateau) after a delay of 110 seconds

Contrast:

- At the discretion of the radiologist inject up to 150ml of 350-370 mg iodine/ml non-ionic contrast injected @ 4ml/ sec (No Saline after contrast) ([See IV Catheter Guidelines](#))
- IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval

PACS Series in order as performed:

- Topogram
- 2x2 Axial ST
- 10x2 thin MIP Coronal
- 10x2 thin MIP Sagittal
- Patient Protocol/Dose Report

≤99lbs	1 cc/lb
100- 200 lbs	100cc
≥ 200lbs	150cc

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ABDOMEN PELVIS with LOWER EXTREMITY VENOGRAM PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64		Scanner	Optima 660
Scan Type	spiral	spiral	spiral		Scan Type	spiral
Detector Configuration	32 x 0.6	16 x 1.2	64 x 0.6		Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.5	0.5		Rotation Time (sec)	0.8
Pitch	0.85	0.85	1		Pitch	0.984:1
Scan FOV	Large	Large	Large		Speed (mm/rot)	39.37
CareDose4D	On	On	On		Scan FOV	Large Body
Quality ref mAs	90	100	100		Auto mA range	100-500
kVp	110				kVp	120
ref kVp		120	120		Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast		Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast		ASIR	50%
Recon 1 ST Axial						
Kernel	I41s Medium +	I41f Medium	I41f Medium			
Window	Abdomen	Abdomen	Abdomen		Recon 1 Venogram	
SAFIRE/ADMIRE	2	2	2		Algorithm	Standard
Slice Thickness (mm)	2	2	3		Window Width/ Level	700/80
Slice Increment (mm)	2	2	3		Slice Thickness (mm)	2.5
Coronal/ Sagittal						
Kernel	I30s Med Smooth	I41f Medium	I41f Medium		Slice Increment (mm)	2.5
Window	CT Angio	Mediastinum	Abdomen		Type	Full
SAFIRE/ADMIRE	2	2	2		ASIR	SS20
Slice Thickness (mm)	10	10	10		Recon 2 Reformats	
Slice Increment (mm)	2	2	2		Algorithm	Standard
Reformat						
Kernel	I41s Medium +	I41f Medium	I41f Medium		Window Width/ Level	700/80
Window	CT Angio	Abdomen	Abdomen		Slice Thickness (mm)	1.25
SAFIRE/ADMIRE	2	2	2		Slice Increment (mm)	0.625
Slice Thickness (mm)	1.5	0.75	0.75		Type	Full
Slice Increment (mm)	0.8	0.5	0.5		ASIR	SS20

CTDI: ≤ 15 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup:

- Scout PA/Lateral from above the area of interest through the through the lesser trochanters
- When positioning the patient, please pay extra attention to make sure the patient is flat (**no knee sponge**) and centered to the table

DFOV: Patient's width plus 4cm

Scan Parameters:

- Scan from just above the area of interest through the lesser trochanters
 - Start the scan above the apices for CTA chest/abdomen/pelvis
 - Start the scan above the diaphragm for abdomen/pelvis

Contrast:

- At the discretion of the radiologist inject 100ml of 350-370 mg iodine/ml non-ionic contrast injected @ 4ml/ sec followed by 100ml normal saline injected @ 4ml/sec ([See IV Catheter Guidelines](#))
- Trigger the scan using the manufacturer's bolus tracking program
 - When the chest is included place the ROI just below the aortic arch in the descending aorta with a trigger of 120 HU
 - When the chest is not included place the ROI just above the diaphragm in the descending aorta with a trigger of 140 HU

PACS Series in order as performed:

- Topogram
- 1x1 Axial ST
- 10x1 thin MIP Axial
- 10mm x 1mm Thin MIP Coronal **when scanning thru the knees split Coronal/Sagittal images as follows- Chest/Abd ; Pelvis/ Upper Legs and/or Abd/Pel ; Upper Legs
- 10mm x 1mm Thin MIP Sagittal **when scanning thru the knees split Coronal/Sagittal images as follows- Chest/Abd ; Pelvis/ Upper Legs and/or Abd/Pel ; Upper Legs
- 3D Images
- Patient Protocol/Dose Report

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ABDOMINAL PERFORATOR CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 0.6	40 x 0.6	64 x 0.6	Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.5	0.5	Rotation Time (sec)	0.5
Pitch	0.75	0.8	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	19.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	90	100	100	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Arterial					
Kernel	B31s Med Smooth	I41f Medium	I31f Med Smooth		
Window	Abdomen	Abdomen	Abdomen	Recon 1 Arterial	
SAFIRE/ADMIRE	0	2	2	Algorithm	Standard
Slice Thickness (mm)	1	1	1	Window Width/ Level	450/ 35
Slice Increment (mm)	1	1	1	Slice Thickness (mm)	1.25
Axial/Coronal/Sagittal MIP					
Kernel	B31s Med Smooth	I41f Medium	I31f Med Smooth	Slice Increment (mm)	1.25
Window	CT Angio	Abdomen	Abdomen	Type	Plus
SAFIRE/ADMIRE	0	2	2	ASIR	SS20
Slice Thickness (mm)	10	10	10	Recon 2 Reformats	
Slice Increment (mm)	1	1	1	Algorithm	Standard
Reformat					
Kernel	B31s Med Smooth	I26f Med Smooth ASA	I30f Med Smooth	Window Width/ Level	700/80
Window	CT Angio	Abdomen	Abdomen	Slice Thickness (mm)	0.625
SAFIRE/ADMIRE	0	2	2	Slice Increment (mm)	0.625
Slice Thickness (mm)	0.6	0.6	0.75	Type	Plus
Slice Increment (mm)	0.3	0.6	0.5	ASIR	SS20

CTDI: ≤ 20 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup:

- Scout PA/Lateral from above the area of interest through the through the lesser trochanters (mid-thigh as requested)
- When positioning the patient, please pay extra attention to make sure the patient is flat (**no knee sponge**) and centered to the table

DFOV: Patient's width plus 4cm

Scan Parameters:

- Arterial Scan from above the diaphragm through the lesser trochanters (mid-thigh as requested)
- Venous Scan 25 seconds after completion of Arterial from above the diaphragm through the lesser trochanters (mid-thigh as requested)

Contrast:

- At the discretion of the radiologist inject 150ml of 350-370 mg iodine/ml non-ionic contrast injected @ 4ml/ sec followed by 100ml normal saline injected @ 4ml/sec ([See IV Catheter Guidelines](#))
- Trigger the scan using the manufacturer's bolus tracking program
 - When the chest is not included place the ROI just above the diaphragm in the descending aorta with a trigger of 200 HU

PACS Series in order as performed:

- Topogram
- 2x2 Arterial/Venous ST
- 10x3 Arterial/Venous thin MIP Axial
- Arterial and Venous 10X1 Thin MIP Coronal ****when scanning thru the knees split Coronal/Sagittal images as follows- Chest/Abd ; Pelvis/ Upper Legs and/or Abd/Pel ; Upper Legs**
- Arterial and Venous 5x3 Thin MIP Sagittal ****when scanning thru the knees split Coronal/Sagittal images as follows- Chest/Abd ; Pelvis/ Upper Legs and/or Abd/Pel ; Upper Legs**
- 3D Images
- Patient Protocol/Dose Report

ABDOMINAL PERFORATOR DR HABASH CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 0.6	40 x 0.6	64 x 0.6	Detector Coverage (mm)	20
Rotation Time (sec)	0.6	0.5	0.5	Rotation Time (sec)	0.5
Pitch	0.75	0.8	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	19.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	90	100	100	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Arterial/Venous					
Kernel	B31 s Med Smooth	I41f Medium	I31f Med Smooth		
Window	Abdomen	Abdomen	Abdomen	Recon 1 Arterial/Venous	
SAFIRE/ADMIRE	0	2	2	Algorithm	Standard
Slice Thickness (mm)	2	2	2	Window Width/ Level	450/ 35
Slice Increment (mm)	2	2	2	Slice Thickness (mm)	2.5
Axial Arterial/Venous					
Kernel	B31 s Med Smooth	I41f Medium	I31f Med Smooth	Slice Increment (mm)	2.5
Window	CT Angio	Mediastinum	Abdomen	Type	Plus
SAFIRE/ADMIRE	0	2	2	ASIR	None
Slice Thickness (mm)	10	10	10	Recon 2 Reformats	
Slice Increment (mm)	3	3	3	Algorithm	Standard
Coronal Arterial/Venous					
Kernel	B31 s Med Smooth	I41f Medium	I31f Med Smooth	Window Width/ Level	450/ 35
Window	CT Angio	Abdomen	Abdomen	Slice Thickness (mm)	0.625
SAFIRE/ADMIRE	0	2	2	Slice Increment (mm)	0.625
Slice Thickness (mm)	10	10	10	Type	Plus
Slice Increment (mm)	1	1	1	ASIR	SS50
Sagittal Arterial/Venous					
Kernel	B31 s Med Smooth	I41f Medium	I31f Med Smooth		
Window	CT Angio	Abdomen	Abdomen		
SAFIRE/ADMIRE	0	2	2		
Slice Thickness (mm)	5	5	5		
Slice Increment (mm)	3	3	3		
Reformat					
Kernel	B31 s Med Smooth	I41f Medium	I30f Med Smooth		
Window	CT Angio	Abdomen	Abdomen		
SAFIRE/ADMIRE	0	2	2		
Slice Thickness (mm)	1	0.6	0.75		
Slice Increment (mm)	0.5	0.6	0.5		

CTDI: ≤ 20 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup:

- Scout PA/Lateral from above the area of interest through the through the lesser trochanters (mid-thigh as requested)
- When positioning the patient, please pay extra attention to make sure the patient is flat (**no knee sponge**) and centered to the table

DFOV: Patient's width plus 4cm

Scan Parameters:

- Arterial Scan to include all requested anatomy
- Venous Scan 25 seconds after completion of Arterial from to include all requested anatomy

Contrast:

- At the discretion of the radiologist inject 150ml of 350-370 mg iodine/ml non-ionic contrast injected @ 4ml/ sec followed by 100ml normal saline injected @ 4ml/sec ([See IV Catheter Guidelines](#))
- Trigger the scan using the manufacturer's bolus tracking program
 - Place the ROI just above the diaphragm in the descending aorta with a trigger of 140 HU

PACS Series in order as performed:

- Topogram
- 1x1 Arterial/Venous ST
- 10x3 Arterial/Venous thin MIP Axial
- 10x1 Arterial/Venous thin MIP Coronal ****when scanning thru the knees split Coronal/Sagittal images as follows- Chest/Abd ; Pelvis/ Upper Legs and/or Abd/Pel ; Upper Legs**
- 5x3 Arterial/Venous thin MIP Sagittal ****when scanning thru the knees split Coronal/Sagittal images as follows- Chest/Abd ; Pelvis/ Upper Legs and/or Abd/Pel ; Upper Legs**
- 3D Images
- Patient Protocol/Dose Report

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ABDOMINAL PERFORATOR DR POTTER CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 0.6	40 x 0.6	64 x 0.6	Detector Coverage (mm)	20
Rotation Time (sec)	0.6	0.5	0.5	Rotation Time (sec)	0.5
Pitch	0.75	0.8	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	19.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	90	100	100	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Arterial/Venous					
Kernel	B31s Med Smooth	I41f Medium	I31f Med Smooth		
Window	Abdomen	Abdomen	Abdomen	Recon 1 Arterial/venous	
SAFIRE/ADMIRE	0	2	2	Algorithm	Standard
Slice Thickness (mm)	1	1	1	Window Width/ Level	450/ 35
Slice Increment (mm)	1	1	1	Slice Thickness (mm)	2.5
Axial Arterial/Venous					
Kernel	B31s Med Smooth	I41f Medium	I31f Med Smooth	Slice Increment (mm)	2.5
Window	CT Angio	Mediastinum	Abdomen	Type	Plus
SAFIRE/ADMIRE	0	2	2	ASIR	None
Slice Thickness (mm)	10	10	10	Recon 2 Reformats	
Slice Increment (mm)	3	3	3	Algorithm	Standard
Coronal Arterial/Venous					
Kernel	B31s Med Smooth	I41f Medium	I31f Med Smooth	Window Width/ Level	450/ 35
Window	CT Angio	Abdomen	Abdomen	Slice Thickness (mm)	0.625
SAFIRE/ADMIRE	0	2	2	Slice Increment (mm)	0.625
Slice Thickness (mm)	10	10	10	Type	Plus
Slice Increment (mm)	1	1	1	ASIR	SS50
Sagittal Arterial/Venous					
Kernel	B31s Med Smooth	I41f Medium	I31f Med Smooth		
Window	CT Angio	Abdomen	Abdomen		
SAFIRE/ADMIRE	0	2	2		
Slice Thickness (mm)	5	5	5		
Slice Increment (mm)	3	3	3		
Reformat					
Kernel	B31s Med Smooth	I41f Medium	I30f Med Smooth		
Window	CT Angio	Abdomen	Abdomen		
SAFIRE/ADMIRE	0	2	2		
Slice Thickness (mm)	1	1	0.75		
Slice Increment (mm)	0.5	0.5	0.5		

CTDI: ≤ 15 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup:

- Scout PA/Lateral from above the area of interest through the through the lesser trochanters
- When positioning the patient, please pay extra attention to make sure the patient is flat (**no knee sponge**) and centered to the table
- **Instruct PT to remove all clothing, undergarments and jewelry, Make sure PT is in a gown**

DFOV: Patient's width plus 4cm

Scan Parameters:

- Scan from above the diaphragm to mid femurs, just above knee
- Late arterial phase only, no noncontrast or delay phases

Contrast:

- At the discretion of the radiologist inject 100ml of 350-370 mg iodine/ml non-ionic contrast injected @ 4 ml/ sec followed by 100ml normal saline injected @ 4ml/sec ([See IV Catheter Guidelines](#))
- Trigger the scan using the manufacturer's bolus tracking program
 - Place the ROI in descending aorta at the level of L4 with a trigger of 200 HU with 12 second delay for scan start to allow deep inferior epigastric perforators to fill with contrast after bolus tracking.

PACS Series in order as performed:

- Topograms
- 2 x 2 Axial MIP
- 20 x 2 Axial MIP
- 20mm x 2mm Thin MIP Coronal ** split Coronal/Sagittal images as follows- Abdomen/pelvis and Femurs
- 20mm x 2mm Thin MIP Sagittal ** split Coronal/Sagittal images as follows - Abdomen/pelvis and Femurs
- 3D Images
- Patient Protocol/Dose Report

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ABDOMINAL PERFORATOR CTA SRINIVASA PROTOCOL SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64		Scanner	Optima 660
Scan Type	spiral	spiral	spiral		Scan Type	spiral
Detector Configuration	32 x 0.6	40 x 0.6	64 x 0.6		Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.5	0.5		Rotation Time (sec)	0.5
Pitch	0.75	0.8	1		Pitch	0.984:1
Scan FOV	Large	Large	Large		Speed (mm/rot)	19.37
CareDose4D	On	On	On		Scan FOV	Large Body
Quality ref mAs	90	100	100		Auto mA range	100-500
kVp	110				kVp	120
ref kVp		120	120		Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast		Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast		ASIR	50%
Late Arterial-12 sec delay						
Kernel	B31s Med Smooth	I41f Medium	I31f Med Smooth			
Window	Abdomen	Abdomen	Abdomen		Recon 1 Arterial	
SAFIRE/ADMIRE	0	2	2		Algorithm	Standard
Slice Thickness (mm)	2	2	2		Window Width/ Level	450/ 35
Slice Increment (mm)	2	2	2		Slice Thickness (mm)	2
Axial/Coronal/Sagittal MIP					Slice Increment (mm)	2
Kernel	B31s Med Smooth	I41f Medium	I31f Med Smooth		Type	Plus
Window	CT Angio	Abdomen	Abdomen		ASIR	SS20
SAFIRE/ADMIRE	0	2	2			
Slice Thickness (mm)	20	20	20		Recon 2 Reformats	
Slice Increment (mm)	2	2	2		Algorithm	Standard
Reformat					Window Width/ Level	700/80
Kernel	B31s Med Smooth	I26f Med Smooth ASA	I30f Med Smooth		Slice Thickness (mm)	0.625
Window	CT Angio	Abdomen	Abdomen		Slice Increment (mm)	0.625
SAFIRE/ADMIRE	0	2	2		Type	Plus
Slice Thickness (mm)	0.6	0.6	0.75		ASIR	SS20
Slice Increment (mm)	0.3	0.3	0.5			

CTDI: ≤ 20 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from above the apices through the entire pelvis

DFOV: Patient's width plus 4cm

Scan Range: Above the apices through the entire pelvis

Scan Parameters:

- Non-contrast from above the apices through aortic bifurcation
- Bolus Tracking/Smart Prep scan trigger is set at 100 HU in the descending aorta just below aortic arch
- Arterial Phase (see chart for IV contrast dosing) from above the Apices through the entire pelvis
 - Injection rate of 4.5ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist followed by 50ml normal saline @ 4.5 ml/sec ([See IV Catheter Guidelines](#))
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval
- Venous Phase obtained 50 seconds after the Arterial scan from above diaphragm through the pelvis
 - 3 minute delay scan will be performed through the aortic graft when a patient presents for a post graft repair evaluation

PACS series in order as performed:

- Topogram
- 2x2 Non-Contrast Axial
- 2x2 Arterial Axial
- 2x2 Lung Axial (focused FOV)
- 10x2 Thin MIP Coronal/Sagittal
- 2x2 Coronal/Sagittal MPR
- MIP/VRT Rotations (3D)
- 2x2 Venous Axial
- 2x2 Post Graft 3min Delay (if obtained)
- Patient Protocol/Dose Report

≤99lbs	44kg	1 cc/lb or 2cc/kg
100-210lbs	45-95kg	100ml
211-290lbs	96-130kg	125ml
≥291lbs	≥131kg	150ml

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CHEST ABDOMEN PELVIS CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 1.2	16 x 0.6	64 x 0.6	Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.5	0.5	Rotation Time (sec)	0.5
Pitch	0.6	0.8	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	39.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	85	100	100	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Non Con/Arterial/Venous					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth		
Window	CT Angio	Mediastinum	Abdomen	Recon NonCon/CAP/Delay	
SAFIRE/ADMIRE	2	2	2	Algorithm	Standard
Slice Thickness (mm)	2	2	2	Window Width/ Level	400/40
Slice Increment (mm)	2	2	2	Slice Thickness (mm)	2.5
Coronal/Sagittal MIP					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth	Slice Increment (mm)	2.5
Window	CT Angio	Mediastinum	Abdomen	Type	Plus
SAFIRE/ADMIRE	2	2	2	ASIR	SS20
Slice Thickness (mm)	10	10	10	Recon 2 Reformats	
Slice Increment (mm)	2	2	2	Algorithm	Standard
Coronal/Sagittal MPR					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth	Window Width/ Level	450/ 35
Window	CT Angio	Abdomen	Abdomen	Slice Thickness (mm)	1.25
SAFIRE/ADMIRE	2	2	2	Slice Increment (mm)	0.625
Slice Thickness (mm)	2	2	2	Type	Full
Slice Increment (mm)	2	2	2	ASIR	SS20
Lung					
Kernel	I80s Very Sharp	I70f Very Sharp ASA	B70f Very Sharp	Recon Lung	
Window	Lung	Lung	Lung	Algorithm	Lung
SAFIRE/ADMIRE	2	1	0	Window Width/ Level	2000/-600
Slice Thickness (mm)	2	2	2	Slice Thickness (mm)	2.5
Slice Increment (mm)	2	2	2	Slice Increment (mm)	2.5
Reformat					
Kernel	I30s Med Smooth	I30f Med Smooth	I30f Med Smooth	Type	Full
Window	CT Angio	Abdomen	Abdomen	ASIR	SS10
SAFIRE/ADMIRE	2	3	2		
Slice Thickness (mm)	1.5	1.5	0.75		
Slice Increment (mm)	0.7	0.8	0.5		

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from above the apices through the adrenal glands

DFOV: Patient's width plus 4cm

Scan Range: Above the apices through mid L1

Scan Parameters:

- Non-contrast from above the Apices to mid body of L1
- Bolus Tracking/Smart Prep scan trigger is set at 80 HU in the descending aorta just below aortic arch, 8 second monitoring delay
- Arterial Phase (see chart for IV contrast dosing) from above the Apices to mid body of L1
 - Injection rate of 4.5ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist followed by 50ml normal saline @ 4.5 ml/sec ([See IV Catheter Guidelines](#))
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval
 - 3 minute delay scan will be performed through the aortic graft when a patient presents for a post graft repair evaluation

PACS series in order as performed:

- Topogram
- 2x2 Non-Contrast Axial
- 2x2 Arterial Axial
- 2x2 Lung Axial (focused FOV)
- 10x2 Thin MIP Coronal/Sagittal
- 2x2 Coronal/Sagittal MPR
- MIP/VRT Rotations (3D)
- 2x2 Post Graft 3min Delay (if obtained)
- Patient Protocol/Dose Report

≤210lbs	≤95kg	75ml
211-290lbs	96-130kg	100ml
≥291lbs	≥131kg	125ml

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CHEST CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 1.2	16 x 0.6	64 x 0.6	Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.5	0.5	Rotation Time (sec)	0.8
Pitch	0.85	1.2	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	39.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	85	100	100	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Non Contrast/Arterial					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth		
Window	CT Angio	Abdomen	CTA PE	Recon 1 NonCon/CTA	
SAFIRE/ADMIRE	2	2	2	Algorithm	Standard
Slice Thickness (mm)	2	2	2	Window Width/ Level	400/40
Slice Increment (mm)	2	2	2	Slice Thickness (mm)	2.5
Coronal/Sagittal MIP					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth	Type	Full
Window	CT Angio	Mediastinum	CTA PE	ASIR	None
SAFIRE/ADMIRE	2	2	2		
Slice Thickness (mm)	10	10	10	Recon 2 Reformats	
Slice Increment (mm)	2	2	2	Algorithm	Standard
Coronal/Sagittal MPR					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth	Window Width/ Level	700/80
Window	CT Angio	Abdomen	CTA PE	Slice Thickness (mm)	1.25
SAFIRE/ADMIRE	2	2	2	Slice Increment (mm)	0.625
Slice Thickness (mm)	2	2	2	Type	Full
Slice Increment (mm)	2	2	2	ASIR	SS20
Lung					
Kernel	I80s Very Sharp	I70f Very Sharp ASA	B70f Very Sharp	Recon 2 Lung	
Window	Lung	Lung	Lung	Algorithm	Lung
SAFIRE/ADMIRE	1	1	0	Window Width/ Level	2000/-600
Slice Thickness (mm)	2	1.5	2	Slice Thickness (mm)	2.5
Slice Increment (mm)	2	1.5	2	Slice Increment (mm)	2.5
Reformat					
Kernel	I30s Med Smooth	I30f Med Smooth	I30f Med Smooth	Type	Full
Window	CT Angio	Mediastinum	CTA PE	ASIR	SS10
SAFIRE/ADMIRE	2	2	2		
Slice Thickness (mm)	1.5	1.5	1		
Slice Increment (mm)	0.7	0.8	0.5		

CTDI: ~5-20 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from above the apices through the entire chest

DFOV: Appropriate for patients body habitus

Scan Range: Above the apices through mid L1

Scan Parameters:

- Arterial Phase (see chart for IV contrast dosing) from above the Apices to mid body of L1 with suspended breath hold
 - Injection rate of 4.5ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist followed by 50ml normal saline @ 4.5 ml/sec ([See IV Catheter Guidelines](#))
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval
 - Contrast monitoring @ pulmonary root with 8 second monitoring delay

*The patient is instructed to stop breathing when contrast monitoring begins.

*No additional breathing instructions will be given.

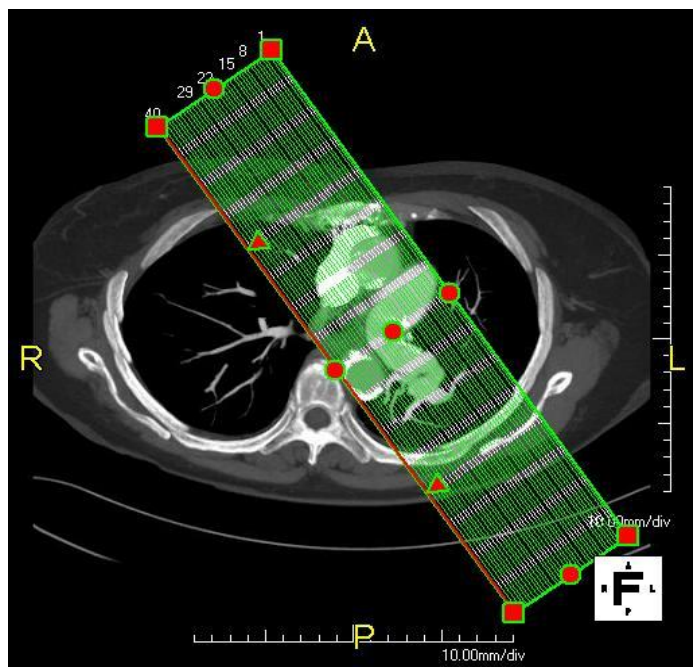
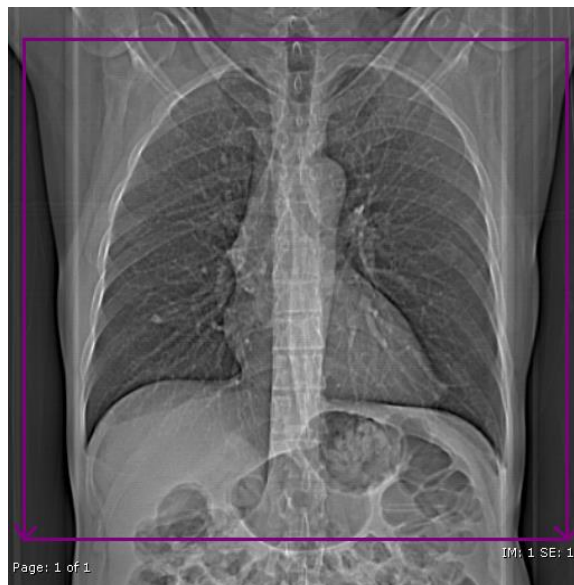
- Siemens scanners start scan when monitoring reaches 80 HU and GE scanners 150 HU

PACS series in order as performed:

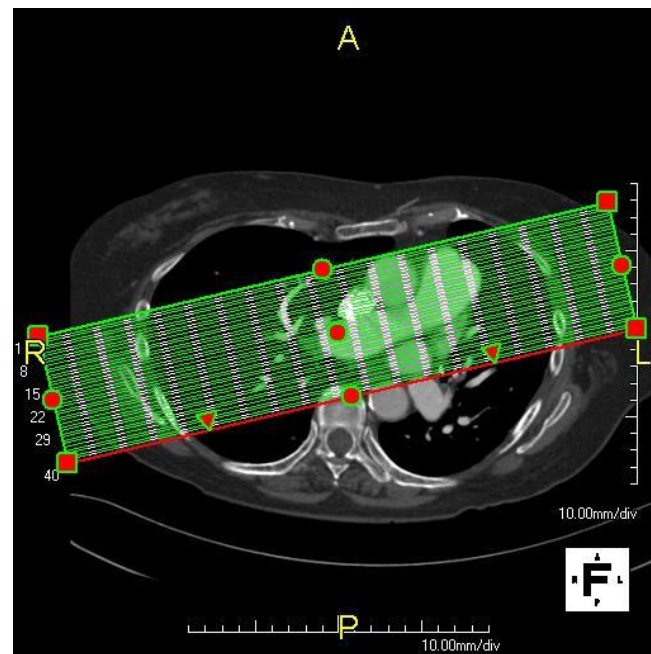
- Topogram
- 2x2 Arterial Axial
- 2x2 Lung Axial (focused FOV)
- 2x2 Coronal/Sagittal MPR
- 10x2 Coronal thin MIP
- 10x2 Right Pulmonary Artery Oblique thin MIP
- 10x2 Left Pulmonary Artery Oblique thin MIP
- Patient Protocol/Dose Report

≤210lbs	≤95kg	75ml
211-290lbs	96-130kg	100ml
≥291lbs	≥131kg	125ml

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10x2 Left Oblique MIP



10x2 Right Oblique MIP

CHEST FOR PE SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 1.2	40 x 0.6	64 x 0.6	Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.5	0.5	Rotation Time (sec)	0.5
Pitch	1	0.8	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	39.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	85	100	100	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Non Con/Arterial					
Kernel	I41s Medium +	I41f Medium	I31f Med Smooth		
Window	CTA PE	Abdomen	CTA PE	Recon 1 PE	
SAFIRE/ADMIRE	2	2	2	Algorithm	Standard
Slice Thickness (mm)	2	2	2	Window Width/ Level	550/60
Slice Increment (mm)	2	2	2	Slice Thickness (mm)	2.5
Coronal/Sagittal MIP				Slice Increment (mm)	2.5
Kernel	I41s Medium +	I41f Medium	I41f Medium	Type	Full
Window	CTA PE	Mediastinum	CTA PE	ASIR	SS20
SAFIRE/ADMIRE	2	2	2		
Slice Thickness (mm)	10	10	10	Recon 2 Reformats	
Slice Increment (mm)	2	2	2	Algorithm	Standard
Coronal/Sagittal MPR				Window Width/ Level	700/80
Kernel	I41s Medium +	I41f Medium	I41f Medium	Slice Thickness (mm)	1.25
Window	CTA PE	Abdomen	CTA PE	Slice Increment (mm)	1.25
SAFIRE/ADMIRE	2	2	2	Type	Full
Slice Thickness (mm)	2	2	2	ASIR	SS20
Slice Increment (mm)	2	2	2		
Lung				Recon Lung	
Kernel	I80s Very Sharp	I70f Medium	B70f Very Sharp	Algorithm	Lung
Window	Lung	Lung	Lung	Window Width/ Level	2000/-600
SAFIRE/ADMIRE	1	2	0	Slice Thickness (mm)	2.5
Slice Thickness (mm)	2	2	2	Slice Increment (mm)	2.5
Slice Increment (mm)	2	2	2	Type	Full
Reformat				ASIR	SS10
Kernel	I30s Med Smooth	I41f Medium	I31f Med Smooth		
Window	CTA PE	Abdomen	CTA PE		
SAFIRE/ADMIRE	2	2	2		
Slice Thickness (mm)	1.5	0.6	1.5		
Slice Increment (mm)	0.7	0.6	1		

CTDI: ~5-20 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from above the apices through the entire chest

DFOV: Appropriate for patients body habitus

Scan Range: Above the apices through mid L1

Scan Parameters:

- Arterial Phase (see chart for IV contrast dosing) from above the Apices to mid body of L1 with suspended breath hold on shallow breathing
 - Injection rate of 6 ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist followed by 50ml normal saline @ 6 ml/sec ([See IV Catheter Guidelines](#))
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval
 - Contrast monitoring @ pulmonary root with 8 second monitoring delay
 - Siemens scanners start scan when monitoring reaches 100 HU and GE scanners 150 HU

*The patient is instructed to stop breathing when contrast monitoring begins.

*No additional breathing instructions will be given.

PACS series in order as performed:

- Topogram
- 2x2 Arterial Axial
- 2x2 Lung Axial (focused FOV)
- 2x2 Sagittal MPR
- 10x2 Coronal thin MIP
- 10x2 Right Pulmonary Artery Oblique thin MIP
- 10x2 Left Pulmonary Artery Oblique thin MIP
- Patient Protocol/Dose Report

≤210lbs	≤95kg	100ml
211-290lbs	96-130kg	125ml
≥291lbs	≥131kg	150ml

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CHEST FOR PE PREGNANT FEMALE SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 1.2	40 x 0.6	64 x 0.6	Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.5	0.5	Rotation Time (sec)	0.5
Pitch	1	0.8	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	39.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	85	100	100	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Non Con/Arterial					
Kernel	I41s Medium +	I41f Medium	I31f Med Smooth		
Window	CTA PE	Abdomen	CTA PE	Recon 1 PE	
SAFIRE/ADMIRE	2	2	2	Algorithm	Standard
Slice Thickness (mm)	2	2	2	Window Width/ Level	550/60
Slice Increment (mm)	2	2	2	Slice Thickness (mm)	2.5
Coronal/Sagittal MIP					
Kernel	I41s Medium +	I41f Medium	I41f Medium	Type	Full
Window	CTA PE	Mediastinum	CTA PE	ASIR	SS20
SAFIRE/ADMIRE	2	2	2		
Slice Thickness (mm)	10	10	10	Recon Reformats	
Slice Increment (mm)	2	2	2	Algorithm	Standard
Coronal/Sagittal MPR					
Kernel	I41s Medium +	I41f Medium	I41f Medium	Window Width/ Level	700/80
Window	CTA PE	Abdomen	CTA PE	Slice Thickness (mm)	1.25
SAFIRE/ADMIRE	2	2	2	Slice Increment (mm)	1.25
Slice Thickness (mm)	2	2	2	Type	Full
Slice Increment (mm)	2	2	2	ASIR	SS20
Lung					
Kernel	I80s Very Sharp	I70f Medium	B70f Very Sharp	Recon Lung	
Window	Lung	Lung	Lung	Algorithm	Lung
SAFIRE/ADMIRE	1	2	0	Window Width/ Level	2000/-600
Slice Thickness (mm)	2	2	2	Slice Thickness (mm)	2.5
Slice Increment (mm)	2	2	2	Slice Increment (mm)	2.5
Reformat					
Kernel	I30s Med Smooth	I41f Medium	I31f Med Smooth	Type	Full
Window	CTA PE	Abdomen	CTA PE	ASIR	SS10
SAFIRE/ADMIRE	2	2	2		
Slice Thickness (mm)	1.5	0.6	1.5		
Slice Increment (mm)	0.7	0.6	1		

PATIENT PREPARATION

- Patient communication is crucial in achieving a high-quality scan.
- This entire procedure needs to be thoroughly explained to the patient prior to starting the exam
- After laying the patient on the table, place their arms at the 10 o'clock and 2 o'clock positions. Place the ECG leads on the upper chest and side ribs of the patient without crossing the lines over the heart. Verify a good rhythm. If a noisy or unclear rhythm is seen the patient's chest may need to be shaved or cleaned with alcohol swabs to help guarantee good contact with the leads are made.
- Perform the following prior to performing the procedure
 - Rehearse the breath hold with the patient and observe the ECG response during the breath hold
 - Explain the importance of holding still and taking normal sized, even breaths during the exam
 - Explain the warm flush feeling that may occur during the injection of contrast
 - Make the patient as comfortable as possible
 - Medic will administer nitro pill before the scan starts, metoprolol as needed

POWER INJECTION PROTOCOL

Power injector is to be loaded with one syringe of 85mL normal saline and one syringe of 75mL Visipaque 320
All injections will be at rate of 5mL/sec and no less than 4.0mL/sec
IV should be placed in LT AC, unless unable to access

ACQUISITION PARAMETERS

- **Care kV on**
- **120 ref kVp**
- **Quality ref mAs 160**
- **Care Dose 4D**
- **64 x 0.6**
- **Rotation Time 0.3s**

SCANNING PARAMETERS

- A Calcium scoring should be performed prior to the CCTA. If a patient has had prior coronary stent placement or bypass graft then the calcium scoring should be eliminated. If stent not due to CAD, then please include Calcium score per Radiologist.
 - ROI should be placed slightly below the carina in the ascending aorta as far away from the SVC as possible (may need to slightly reduce the size of the ROI to avoid streak artifact from the SVC)
 - A saline test injection will be done with 30ml of saline to ensure good flow
 - Continue to watch heart rate, allowing it to return to normal after nitro has fully dissolved (will slightly increase after dosing)
 - Ideal scan heart rate is 55-65bpm (can scan at 50-70bpm)
 - If the patient has an irregular rhythm or PVC's, time scan as best as possible to avoid irregular beats
 - Images to be acquired at least 5 minutes after nitro administration to ensure arteries are open
 - ROI trigger is set for 100 HU with a 10 sec injection delay and 4 sec scan delay
 - Reconstructions should be done with an 18-20cm FOV
- Coronary CTA scan should start at the level of the carina and extend to below the base of the heart, extend box in case the patient takes a different sized breath
- ****IF BYPASS GRAFT: Start the scan above the level of the clavicles**
Start scan and contrast injection of 75mL Visipaque 320 at the same time

*****CLEERLY – directly upload the source images and multiphase to the CLEERLY portal from the scanner*****

RECONSTRUCTION PARAMETERS

After the scan is complete a preview series at the level of the coronary artery origins

Choose the R-R interval % with the least amount of motion to perform the following reconstructions (usually 70%)

- Recon 1 (Source Images)

0.75 mm slice increment x 0.4 mm slice thickness

SAFIRE: 2

Kernel: I26f medium Smooth

- Recon 2 Reformat

0.6 mm slice increment x 0.6 mm slice thickness

SAFIRE: 2

Kernel: I26f medium Smooth

Used to create:

- RCA, LAD, LCX rotational MPRs
- RCA, LAD, LCX Slab MPRs
- Colored VR images

- Recon 3 TVA/ Multi-phase reconstruction

0.75 mm slice increment x 0.4 mm slice thickness

SAFIRE: 2

Kernel: I26f medium Smooth

Used to perform right ventricular ejection fraction

CORONARY CTA SCAN PROTOCOL

Scanner	Definition AS 64	
Scan Type	axial	
Detector Configuration	64 x 0.6	
Rotation Time (sec)	0.3	
Feed	17	
Scan FOV	Large	
CareDose4D	On	
Quality ref mAs	50	
ref kVp	120	
Optimize Slider position	3	
Calcium Score Axial/Test Bolus		
Kernel	I30f Med Smooth	
Window	Mediastinum	
SAFIRE/ADMIRE	2	
Slice Thickness (mm)	3	
Slice Increment (mm)	3	
Scanner		
Definition AS 64		
Scan Type	spiral	
Detector Configuration	64 x 0.6	
Rotation Time (sec)	0.3	
Pitch	0.18	
Source Images		
Kernel	I26f Med Smooth	
Window	CT Angio	
SAFIRE/ADMIRE	2	
Slice Thickness (mm)	0.75	
Slice Increment (mm)	0.4	
Reformat		
Kernel	I26f Med Smooth	
Window	Cardiac	
SAFIRE/ADMIRE	2	
Slice Thickness (mm)	0.6	
Slice Increment (mm)	0.6	
Multi Phase		
Kernel	I26f Med Smooth	
Window	Cardiac	
SAFIRE/ADMIRE	2	
Slice Thickness (mm)	0.75	
Slice Increment (mm)	0.4	

Chest without Contrast:

Setup:

****Only the bariatric flat table top is to be used****

****It is important to make sure the arms are as close to the patient's side as possible****

****Please make sure the patient is flat and centered to the table and isocenter in the gantry****

- Head first, supine, arms down by the patient's side
- one pillow under the head only
- knee bolster may be used, do not use any other positioning devices
- Initial chest scan is performed without ECG leads

****All scans will be acquired on full expiration****

- Please explain to the patient that they take the same breath each time

Scan:

- Scout from above the chin through the diaphragm
- Scan range will be from the chin through the diaphragm

Recon:

- First reconstruction is a CD Data set (also the ST recon)
 - Full extended DFOV 78cm
 - Soft Tissue kernel and ww/wl
 - 1x1
- 1x1 Lung
- 1x1 ST Coronal
- 1x1 ST Sagittal

Coronary CTA

Setup:


- head first, supine, arms down by the patient's side
- one pillow under the head only
- knee bolster may be used, do not use any other positioning devices
- this scan is performed with ECG leads
- Acquired on full expiration
- Use Omnipaque 350
- "Coronary Draw" on power injector (100cc contrast, 175cc Saline)
- 18g LAC on **ALL** coronary patients *****Patients should arrive with IV intact*****
- iStat on **ALL** coronary patients
- Flat table top is required

Place Test Bolus scan at ascending aorta (slightly below carina)

Coronary Test on power injector (25cc Saline, 20cc contrast, 50cc saline)

Perform test injection of saline

Perform Test Bolus

- start contrast injection and scan at same time
- Watch ascending aorta highlight (every 2 seconds). After it dims twice, stop scan
- Click on applications  then click DynEva
- Open Local Database, double click Test Bolus (should be loaded into Dynamic Evaluation)
- Type in 10 seconds to delay box
- Click on "Elliptical ROI" and place ROI into ascending aorta on top RT image (brightest)
- Look at seconds displayed in "Time to Peak" (above red graph)
- Click "End Evaluation", click "yes" to store results
- Type in total scan delay for the actual scan

CORONARY SCAN

SET UP:

Scan from above the clavicles through the entire heart

- Acquired on full expiration
- Begin Coronary Scan and contrast injection simultaneously

Reconstructions:

- Note the Average HR (listed just above EKG rhythm in Trigger tab), let medic know HR
- DFOV should include entire chest wall (skin to skin)
- Scroll through to find where the RCA is in a true axial plane and the click preview series on bottom right
- After preview series is completed, scroll through to see which percentage shows the RCA, LAD and Circumflex the best (percentage is shown on bottom middle of images it's typically between 55% and 75%)
- Recon first 2 boxes with the appropriate percentage phase
- Make sure "Multi-phase" is checked on last recon box (above preview series)
- Recon multi-phase this will be used for a CD Data set and will also provide ejection fraction

To PACS:

- Scout
- Chest w/o
- Lung
- Chest Coronal
- Chest Sagittal
- Coronary Source Images
- Multiphase reconstruction
- Protocol Page

To 3D (Tera Recon):

- Reformat
- Multiphase

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CTDI: ≤20 mGy per acquisition

See [Patient Positioning](#) for additional information

PT Preparation: Supine

DFOV: Patient's width plus 4cm

Scan Range: From above the apices through the entire pelvis

Scan Parameters:

Non-Contrast- From above the apices through the aortic bifurcation

Bolus Tracking/Smart Prep scan trigger is set at 100 HU in the descending aorta just below the level of the aortic arch

Arterial Phase –From above the apices through the entire pelvis

*(see chart for IV contrast dosing)

- Injection rate of 4.5 ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the Radiologist followed by 50 ml normal saline @ 4.5 ml/sec ([See IV Catheter Guidelines](#))
- *IV Contrast volumes are based on patients with a normal GFR
*Do not exceed a total volume of 150cc without radiologist approval

≤99lbs	44kg	1 cc/lb or 2cc/kg
100-210lbs	45-95kg	100ml
211-290lbs	96-130kg	125ml
≥291lbs	≥131kg	150ml

Venous Scan is acquired 50 seconds after the arterial scan- from above the diaphragm through the pelvis

A 3 minute delay scan will be performed through the aortic graft when a patient presents for a post graft repair evaluation

PACS Series:

- Topogram
- 2x2 Non-Contrast Axial
- 2x2 Arterial Axial
- 2x2 Lung Axial (Field of view should be focused from rib to rib)
- 10x2 Arterial Thin MIP Coronal
- 10x2 Arterial Thin MIP Sagittal
- 2x2 Coronal MPR
- 2x2 Sagittal MPR
- CTA MIP and VRT rotations
- 2x2 Venous Axial
- 2x2 Post Aortic Graft 3 minute Delay Axial

DISSECTION SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 0.6	40 x 0.6	16 x 0.6	Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.5	0.33	Rotation Time (sec)	0.5
Pitch	1	0.8	0.8	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	39.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	100	100	100	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Chest S					
Kernel	I41s Medium +	I41f Medium	I41f Medium		
Window	Mediastinum	Abdomen	Mediastinum	Recon 1 Non Con/CAP	
SAFIRE/ADMIRE	2	2	2	Algorithm	Standard
Slice Thickness (mm)	3	2	3	Window Width/ Level	400/40
Slice Increment (mm)	3	2	3	Slice Thickness (mm)	2.5
Arterial/Coronal/Sagittal MPR					
Kernel	I41s Medium +	I41f Medium	I41f Medium	Type	Full
Window	CT Angio	Abdomen	CTA PE	ASIR	SS20
SAFIRE/ADMIRE	2	2	2		
Slice Thickness (mm)	3	2	3	Recon 2 Reformats	
Slice Increment (mm)	3	2	3	Algorithm	Standard
Coronal/Sagittal MIP					
Kernel	I41s Medium +	I41f Medium	I41f Medium	Window Width/ Level	400/60
Window	CT Angio	Mediastinum	CTA PE	Slice Thickness (mm)	1.25
SAFIRE/ADMIRE	2	2	2	Slice Increment (mm)	1.25
Slice Thickness (mm)	10	10	10	Type	Full
Slice Increment (mm)	3	2	3	ASIR	SS20
Lung					
Kernel	I80s Very Sharp	I70f Medium	B70f Very Sharp	Recon Lung	
Window	Lung	Lung	Lung	Algorithm	Lung
SAFIRE/ADMIRE	2	2	0	Window Width/ Level	2000/-600
Slice Thickness (mm)	3	2	3	Slice Thickness (mm)	2.5
Slice Increment (mm)	3	2	3	Slice Increment (mm)	2.5
Reformat					
Kernel	B10s Very Smooth	I41f Medium	I30f Med Smooth	Type	Full
Window	CT Angio	Abdomen	CTA PE	ASIR	SS10
SAFIRE/ADMIRE	0	2	2		
Slice Thickness (mm)	1	0.6	1		
Slice Increment (mm)	0.8	0.6	1		

CTDI: ~10-20 mGy per acquisition

See [Patient Positioning](#) for additional information

Preparation: Patient will consume three 450ml bottles of Breeza, total prep time is appx 45 mins

- 1st dose given 45mins prior to scan time **PT to lie on RT side in between drinking
- 2nd dose given 30mins prior to scan time
- 3rd dose given 15mins prior to scan time
- PT to drink 225ml of water 10mins prior to lying down on CT table

****Radiologist questions should be directed to your designated Body MR Radiologist****

Setup: Supine, PA/Lateral scout from above the diaphragm through the symphysis pubis

DFOV: Appropriate for patient's body habitus. Use same DFOV as prior exam when available.

Scan Parameters:

- Arterial scan from above diaphragm through symphysis pubis
- Portal Venous scan 30 seconds after arterial acquisition is complete from above the diaphragm through the symphysis pubis
- Bolus Tracking/Smart Prep scan trigger is set at 80 HU in the descending aorta at the level of the scan start
 - Injection rate of 4.5 ml/sec of 320-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist (not to exceed 150ml) followed by 50ml normal saline @ 4.5 ml/sec ([See IV Catheter Guidelines](#))

PACS series in order as performed:

- Topogram
- 3x3 Arterial Axial
- 3x3 Arterial Coronal/Sagittal
- 3x3 Venous Axial
- 3x3 Venous Coronal/Sagittal
- MIP/VRT Rotations (3D)
- Patient Protocol/Dose Report

Patient's weight in lbs.	Patients weight in kg	Volume of Contrast
≤99lbs	44kg	1 cc/lb. or 2cc/kg
100-210lbs	45-95kg	100ml
211-290lbs	96-130kg	125ml
≥291lbs	≥131kg	150ml

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ENTEROGRAPHY/SMALL BOWEL CTA PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64		Scanner	Optima 660
Scan Type	spiral	spiral	spiral		Scan Type	spiral
Detector Configuration	32 x 1.2	32 x 1.2	16 x 1.2		Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.6	0.5		Rotation Time (sec)	0.8
Pitch	0.6	1	1		Pitch	1.375:1
Scan FOV	Large	Large	Large		Speed (mm/rot)	55
CareDose4D	On	On	On		Scan FOV	Large Body
Quality ref mAs	140	100	100		Auto mA range	100-500
kVp	110				kVp	120
ref kVp		120	120		Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast		Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast		ASIR	50%
Arterial/Venous						
Kernel	I41s Medium +	I41f Medium +	I41f Medium			
Window	Abdomen	Abdomen	Abdomen		Recon 1 Arterial/Venous	
SAFIRE/ADMIRE	2	2	2		Algorithm	Standard
Slice Thickness (mm)	3	5	3		Window Width/ Level	400/40
Slice Increment (mm)	3	5	3		Slice Thickness (mm)	2.5
Coronal/ Sagittal MIP					Slice Increment (mm)	2.5
Kernel	I41s Medium +	I41f Medium +	I41f Medium		Type	Full
Window	CT Angio	Abdomen	CT Angio		ASIR	SS20
SAFIRE/ADMIRE	2	2	2			
Slice Thickness (mm)	3	5	3		Recon 2 Reformats	
Slice Increment (mm)	3	5	3		Algorithm	Standard
Reformat					Window Width/ Level	700/80
Kernel	I41s Medium +	I41f Medium +	I30f Med Smooth		Slice Thickness (mm)	1.25
Window	CT Angio	Abdomen	Abdomen		Slice Increment (mm)	0.625
SAFIRE/ADMIRE	2	2	2		Type	Full
Slice Thickness (mm)	2	5	1.5		ASIR	SS20
Slice Increment (mm)	1	5	0.75			

CTDI: ≤ 25 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from above the diaphragm through the through the ischial tuberosities

DFOV: Patient's width plus 4cm

Scan Range: Above the diaphragm through the ischial tuberosities

Scan Parameters:

- Non-contrast from above the diaphragm through the ischial tuberosities
- Bolus Tracking/Smart Prep scan trigger is set at 150 HU in the descending aorta at the level of the scan start + 12 second delay after trigger
- Late Arterial Phase
 - Injection rate of 4 ml/sec of 320-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist followed by 50ml normal saline @ 4 ml/sec ([See IV Catheter Guidelines](#))
 - IV contrast @ 1.5ml/kg of body weight
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval
- Delay obtained 150 seconds post arterial phase from above the diaphragm through the ischial tuberosities

PACS series in order as performed:

- Topogram
- 5x5 Non-Contrast Axial
- 2.25 x 2.25 (2x2 Siemens) Non-Contrast Coronal MPR
- 2.25 x 2.25 (2x2 Siemens) Arterial Axial
- 2.25 x 2.25 (2x2 Siemens) Arterial Coronal/Sagittal MPR
- 10x1.25 (10x1 Siemens) Arterial Coronal/Sagittal thin MIP
- MIP/VRT Rotations (3D)
- 5x5 Delay Axial
 1. 2.25 x 2.25 (2x2 Siemens) Delay Coronal/Sagittal MPR
- Patient Protocol/Dose Report

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GI BLEED CTA PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 0.6	32 x 1.2	16 x 1.2	Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.6	0.5	Rotation Time (sec)	0.8
Pitch	0.8	1	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	39.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	90	100	100	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Non Contrast/Delay					
Kernel	I31s Med Smooth	I41f Medium +	I41f Medium +	Recon 1 ST Axial	
Window	Abdomen	Abdomen	Abdomen	Algorithm	Standard
SAFIRE/ADMIRE	1	2	2	Window Width/ Level	450/ 35
Slice Thickness (mm)	5	5	5	Slice Thickness (mm)	5
Slice Increment (mm)	5	5	5	Slice Increment (mm)	5
Arterial				Type	Full
Kernel	I31s Med Smooth	I26f Med Smooth	I30f Med Smooth	ASIR	SS50
Window	Abdomen	Abdomen	Abdomen		
SAFIRE/ADMIRE	2	2	2	Recon 2 Reformats	
Slice Thickness (mm)	2	2	2	Algorithm	Standard
Slice Increment (mm)	2	2	2	Window Width/ Level	450/ 35
Coronal/ Sagittal MIP				Slice Thickness (mm)	2.5
Kernel	I31s Med Smooth	I41f Medium	I41f Medium	Slice Increment (mm)	1.25
Window	CT Angio	Mediastinum	Abdomen	Type	Full
SAFIRE/ADMIRE	2	2	2	ASIR	SS50
Slice Thickness (mm)	10	10	10		
Slice Increment (mm)	1	1	1		
Reformat					
Kernel	I30s Med Smooth	I26f Med Smooth	I30f Med Smooth		
Window	CT Angio	Abdomen	Abdomen		
SAFIRE/ADMIRE	2	3	2		
Slice Thickness (mm)	1	1.5	1		
Slice Increment (mm)	0.5	0.8	0.7		

CTDI: ≤ 20 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from above the above the aortic bifurcation through the entire pelvis

DFOV: Patient's width plus 4cm

Scan Range: Above the aortic bifurcation through the entire pelvis

Scan Parameters:

- Bolus Tracking/Smart Prep scan trigger is set at 120 HU in the descending aorta at the level of the scan start
- Arterial Phase (see chart for IV contrast dosing) from above the aortic bifurcation through the entire pelvis
 - Injection rate of 4.5ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist followed by 50ml normal saline @ 4.5 ml/sec ([See IV Catheter Guidelines](#))
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval

PACS series in order as performed:

- Topogram
- 2x2 Arterial Axial
- 10x2 Thin MIP Coronal/Sagittal
- MIP/VRT Rotations (3D)
- Patient Protocol/Dose Report

≤99lbs	44kg	1 cc/lb or 2cc/kg
100-210lbs	45-95kg	100ml
211-290lbs	96-130kg	125ml
≥291lbs	≥131kg	150ml

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PELVIS CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64		Scanner	Optima 660
Scan Type	spiral	spiral	spiral		Scan Type	spiral
Detector Configuration	32 x 1.2	32 x 1.2	64 x 0.6		Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.6	0.5		Rotation Time (sec)	0.7
Pitch	0.6	1	1		Pitch	0.984:1
Scan FOV	Large	Large	Large		Speed (mm/rot)	39.37
CareDose4D	On	On	On		Scan FOV	Large Body
Quality ref mAs	90	100	100		Auto mA range	100-500
kVp	110				kVp	120
ref kVp		120	120		Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast		Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast		ASIR	50%
Arterial						
Kernel	I31s Med Smooth	I41f Medium +	I31f Med Smooth			
Window	Abdomen	Abdomen	Abdomen		Recon 1 Arterial	
SAFIRE/ADMIRE	2	2	2		Algorithm	Standard
Slice Thickness (mm)	2	5	2		Window Width/ Level	700/80
Slice Increment (mm)	2	5	2		Slice Thickness (mm)	2.5
Coronal/ Sagittal MIP						
Kernel	I31s Med Smooth	I41f Medium +	I41f Medium		Slice Increment (mm)	2.5
Window	CT Angio	Abdomen	Abdomen		Type	Full
SAFIRE/ADMIRE	2	2	2		ASIR	SS20
Slice Thickness (mm)	10	5	10		Recon 2 Reformats	
Slice Increment (mm)	2	5	2		Algorithm	Standard
Reformat						
Kernel	I30s Med Smooth	I41f Medium +	I30f Med Smooth		Window Width/ Level	700/80
Window	CT Angio	Abdomen	Abdomen		Slice Thickness (mm)	1.25
SAFIRE/ADMIRE	2	2	2		Slice Increment (mm)	0.625
Slice Thickness (mm)	1.5	5	1		Type	Full
Slice Increment (mm)	1	5	0.7		ASIR	SS20

CTDI: ≤ 25 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from above the above the aortic bifurcation through the entire pelvis

DFOV: Patient's width plus 4cm

Scan Range: Above the aortic bifurcation through the entire pelvis

Scan Parameters:

- Patient to receive Nitro prior to scan ***Given by Medic on table right before scanning***
- Bolus Tracking/Smart Prep scan trigger is set at 140 HU in the descending aorta at the level of the scan start
- Arterial Phase (see chart for IV contrast dosing) from above the aortic bifurcation through the entire pelvis
 - Injection rate of 4.5ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist followed by 50ml normal saline @ 4.5 ml/sec ([See IV Catheter Guidelines](#))
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval

PACS series in order as performed:

- Topogram
- 2x2 Arterial Axial
- 10x2 Thin MIP Coronal/Sagittal
- MIP/VRT Rotations (3D)
- 10x2 RAO (40 degrees RAO, 10 degrees Caudal-3D)
- 10x2 LAO (40 degrees LAO, 10 degrees Caudal-3D)
- Patient Protocol/Dose Report

≤99lbs	44kg	1 cc/lb or 2cc/kg
100-210lbs	45-95kg	100ml
211-290lbs	96-130kg	125ml
≥291lbs	≥131kg	150ml

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PELVIS FOR PROSTATE ARTERY CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 64			
Scan Type	spiral	spiral			
Detector Configuration	32 x 1.2	64 x 0.6			
Rotation Time (sec)	0.6	0.5			
Pitch	0.6	1			
Scan FOV	Large	Large			
CareDose4D	On	On			
Quality ref mAs	90	100			
kVp	110				
ref kVp		120			
Optimize Slider position		3 w/o contrast			
Optimize Slider position		7 w/ contrast			
Arterial					
Kernel	I41s Medium +	I31f Med Smooth			
Window	Abdomen	Abdomen			
SAFIRE/ADMIRE	2	2			
Slice Thickness (mm)	5	2			
Slice Increment (mm)	5	2			
Coronal/ Sagittal MIP					
Kernel	I41s Medium +	I41f Medium			
Window	Abdomen	Abdomen			
SAFIRE/ADMIRE	2	2			
Slice Thickness (mm)	5	10			
Slice Increment (mm)	5	2			
Reformat					

PELVIS VENOGRAM- Revised-4/16/2019

CTDI: ≤ 20 mGy per acquisition

Only used when a Pelvis only is specifically Requested

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from mid abdomen through mid-thigh

DFOV: Patient's width plus 4cm

Scan Range: Above the inferior vena cava confluence (just above iliac crest) through entire pelvis

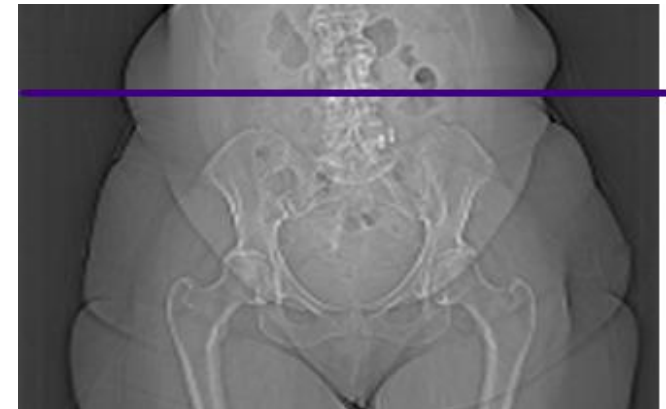
Scan Parameters:

- Venogram Phase (see chart for IV contrast dosing) from above the inferior vena cava confluence the entire pelvis after a delay of 120 seconds ([See IV Catheter Guidelines](#))
 - Injection rate of 4 ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist (**No saline after Contrast**)
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval

PACS series in order as performed:

- Topogram
- 2x2 Arterial Axial
- 10x2 Thin MIP Coronal/Sagittal
- MIP/VRT Rotations (3D)
- Patient Protocol/Dose Report

≤99lbs	1 cc/lb
100- 200 lbs	100cc
≥ 200lbs	150cc



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PELVIS VENOGRAM SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 1.2	32 x 1.2	64 x 0.6	Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.6	0.5	Rotation Time (sec)	0.8
Pitch	0.85	1	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	39.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	85	100	100	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Venogram					
Kernel	I41s Medium +	I41f Medium +	I41f Medium		
Window	Abdomen	Abdomen	Abdomen	Recon 1 Venogram	
SAFIRE/ADMIRE	2	2	2	Algorithm	Standard
Slice Thickness (mm)	2	5	2	Window Width/ Level	700/80
Slice Increment (mm)	2	5	2	Slice Thickness (mm)	2.5
Coronal/ Sagittal MIP				Slice Increment (mm)	2.5
Kernel	I30s Med Smooth	I41f Medium +	I41f Medium	Type	Full
Window	CT Angio	Abdomen	Abdomen	ASIR	SS20
SAFIRE/ADMIRE	2	2	2		
Slice Thickness (mm)	10	5	10	Recon 2 Reformats	
Slice Increment (mm)	2	5	2	Algorithm	Standard
Reformat				Window Width/ Level	700/80
Kernel	I41s Medium +	I41f Medium +	I41f Medium	Slice Thickness (mm)	1.25
Window	CT Angio	Abdomen	Abdomen	Slice Increment (mm)	0.625
SAFIRE/ADMIRE	2	2	2	Type	Full
Slice Thickness (mm)	1.5	5	0.75	ASIR	SS20
Slice Increment (mm)	0.8	5	0.5		

CTDI: ≤ 20 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from above the aortic bifurcation through the through toes

DFOV: Patient's width plus 4cm

Scan Parameters:

- Bolus Tracking/Smart Prep scan trigger is set at 120 HU in the descending aorta at the level of the scan start
- Arterial Phase (see chart for IV contrast dosing) above the aortic bifurcation through the feet
 - Injection rate of 4.5ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist followed by 100ml normal saline @ 4.5 ml/sec ([See IV Catheter Guidelines](#))
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval

PACS series in order as performed:

- Topogram
- 2x2 Arterial Axial
- 10x2 Pelvis thin MIP Coronal/Sagittal
- 10x2 Upper Leg thin MIP Coronal/Sagittal
- 10x2 Lower Leg thin MIP Coronal/Sagittal
- MIP/VRT Rotations, Lower Leg Slabs (3D)
- Patient Protocol/Dose Report

≤99lbs	44kg	1 cc/lb or 2cc/kg
100-210lbs	45-95kg	100ml
211-290lbs	96-130kg	125ml
≥291lbs	≥131kg	150ml

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PELVIS with RUNOFF CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64		Scanner	Optima 660	
Scan Type	spiral	spiral	spiral		Scan Type	spiral	
Detector Configuration	32 x 1.2	16 x 1.2	64 x 0.6		Detector Coverage (mm)	40	
Rotation Time (sec)	0.6	0.6	0.5		Rotation Time (sec)	0.7	
Pitch	0.6	0.85	1		Pitch	0.984:1	
Scan FOV	Large	Large	Large		Speed (mm/rot)	39.37	
CareDose4D	On	On	On		Scan FOV	Large Body	
Quality ref mAs	90	90	90		Auto mA range	100-500	
kVp	110				kVp	120	
ref kVp		120	120		Smart mA	On	
Optimize Slider position		3 w/o contrast	3 w/o contrast		Noise Index	15	
Optimize Slider position		7 w/ contrast	7 w/ contrast		ASIR	50%	
Arterial							
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth				
Window	Abdomen	Abdomen	Abdomen		Recon 1 Arterial		
SAFIRE/ADMIRE	2	2	2		Algorithm	Standard	
Slice Thickness (mm)	2	2	2		Window Width/ Level	700/80	
Slice Increment (mm)	2	2	2		Slice Thickness (mm)	2.5	
Reformat					Slice Increment (mm)	2.5	
Kernel	B10s Very Smooth	I26f Med Smooth	I26f Med Smooth		Type	Full	
Window	CT Angio	Abdomen	Abdomen		ASIR	SS20	
SAFIRE/ADMIRE	0	2	2				
Slice Thickness (mm)	1.5	1.5	1.5		Recon 2 Reformats		
Slice Increment (mm)	0.7	0.8	0.7		Algorithm	Soft	
Cor/Sag MIP					Window Width/ Level	700/80	
Kernel	I31s Med Smooth	I41f Medium	I41f Medium		Slice Thickness (mm)	1.25	
Window	CT Angio	Mediastinum	Abdomen		Slice Increment (mm)	0.625	
SAFIRE/ADMIRE	2	2	2		Type	Full	
Slice Thickness (mm)	10	10	10		ASIR	SS20	
Slice Increment (mm)	2	2	2				
Cor/Sag MPR							
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth				
Window	Abdomen	Abdomen	Abdomen				
SAFIRE/ADMIRE	2	2	2				
Slice Thickness (mm)	2	2	2				
Slice Increment (mm)	2	2	2				

PATIENT PREPARATION

Patient communication is crucial in achieving a high quality scan.

- This entire procedure needs to be thoroughly explained to the patient prior to starting the exam
- After laying the patient on the table, place their arms at the 10 o'clock and 2 o'clock positions. Place the ECG leads on the patient and verify a good rhythm. If a noisy or unclear rhythm is seen the patient's chest may need to be shaved or cleaned with alcohol swabs to help guarantee good contact with the leads are made.
- Perform the following prior to performing the procedure
 - Rehearse the breath hold with the patient and observe the ECG response during the breath hold
 - Explain the importance of holding still during the exam
 - Explain the warm flush feeling that may occur during the injection of contrast
 - Make the patient as comfortable as possible

POWER INJECTION PROTOCOL

Power injector is to be loaded with two syringes

- one syringe of 100ml normal saline
- one syringe of 120ml of 350-370 mg iodine/ml non-ionic contrast

Dual-Phase Injection

Phase 1 (used to initiate scan) 90cc of contrast injected at 5cc/sec ~ 18sec

Phase 2 30cc of contrast injected at 3cc/sec ~ 10sec

Phase 3 30cc of normal saline injected at 3cc/sec

ACQUISITION PARAMETERS

- 120 kVp
- 350-400 mAs
- Care Dose 4D
- 30 x 0.6
- Rotation Time 0.33s
- Pitch 0.2

SCANNING PARAMETERS

- Bolus Tracking used with ROI placed in the ascending aorta above the pulmonary artery
 - Trigger set at 100HU
- CTA scan should start above the aortic arch and extend to below the base of the heart.

RECONSTRUCTION PARAMETERS

After the scan is complete a preview series at the level of the mid heart should be performed.

Choose the R-R interval % with the least amount of motion to perform the following reconstructions.

- Recon 1 (Source Images/CD Set)
1 mm slice increment x 1 mm slice thickness
B35
- Recon 2 Reformat
0.75 mm slice increment x .3mm slice thickness
B35
Reformat set will be used to create:
 - Coronal MPR's at 1x1
 - Coronal MIPs at 10mm thickness x 1mm increment
 - Sag MIPs at 10mm thick x 1mm increment
 - Colored VR images of the pulmonary vein

PULMONARY VEIN CTA SCAN PROTOCOL

Scanner	Definition AS 64
Scan Type	spiral
Detector Configuration	64 x 0.6
Rotation Time (sec)	0.3
Pitch	0.18
Scan FOV	Large
CareDose4D	On
Quality ref mAs	100
ref kVp	120
Optimize Slider position	7
Source Heart	
Kernel	I26f Med Smooth
Window	CT Angio
SAFIRE/ADMIRE	2
Slice Thickness (mm)	1
Slice Increment (mm)	1
Coronal MPR	
Kernel	I41f Medium
Window	Mediastinum
SAFIRE/ADMIRE	2
Slice Thickness (mm)	1
Slice Increment (mm)	1
Mediastinum	
Kernel	I41f Medium
Window	Mediastinum
SAFIRE/ADMIRE	2
Slice Thickness (mm)	3
Slice Increment (mm)	3
Coronal/Sagittal MIP	
Kernel	I41f Medium
Window	Mediastinum
SAFIRE/ADMIRE	2
Slice Thickness (mm)	10
Slice Increment (mm)	1
Lung	
Kernel	B70f Very Sharp
Window	Lung
SAFIRE/ADMIRE	0
Slice Thickness (mm)	3
Slice Increment (mm)	3
Reformat	
Kernel	I26f Med Smooth
Window	Cardiac
SAFIRE/ADMIRE	2
Slice Thickness (mm)	0.6
Slice Increment (mm)	0.6

**Protocol designed to minimize the amount of radiation while maximizing the yield and produce diagnostically acceptable image quality*

CTDI: ~15-20 mGy per acquisition

Setup: **IV ACCESS TO BE OBTAINED IN ARM CONTRA-LATERAL TO PATIENT'S SYMPTOMS**

- Scan 1: Neutral Positioning- Supine, PA/Lateral Scout with both arms alongside body and head located medially
- Scan 2: Postural Positioning- Supine PA/Lateral Scout with both arms elevated above head and rotation of head to affected side

DFOV: Patient's width plus 4cm

Scan Range: Entire Aortic Root through C4

Scan Parameters:

- Neutral Arterial Scan to include entire aortic root through C4
- Bolus Tracking/Smart Prep scan trigger is set at 80 HU in the descending aorta just below aortic arch
 - 75ml of 350-370 mg iodine/ml non-ionic IV contrast @ 4 ml/sec at the discretion of the radiologist followed by 50ml normal saline @ 4 ml/sec ([See IV Catheter Guidelines](#))
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval
- Postural Arterial Scan to include entire aortic root through C4
- Bolus Tracking/Smart Prep scan trigger is set at 80 HU in the descending aorta just below aortic arch
 - 75ml of 350-370 mg iodine/ml non-ionic IV contrast @ 4 ml/sec at the discretion of the radiologist followed by 50ml normal saline @ 4 ml/sec
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval

PACS series in order as performed:

- Topogram
- 1x1 Neutral Axial
- 1x1 Neutral Coronal/Sagittal thin MIP
- 3x3 Neutral Lung (focused FOV)
- 1x1 Postural Axial
- 1x1 Postural Coronal/Sagittal thin MIP
- 3x3 Postural Lung (focused FOV)
- Neutral/Postural VRT/MIP Rotations (3D)
- Patient Protocol/Dose Report

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THORACIC OUTLET CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64		Scanner	Optima 660	
Scan Type	spiral	spiral	spiral		Scan Type	Helical	
Detector Configuration	32 x 0.6	16 x 1.2	64 x 0.6		Detector Coverage (mm)	20	
Rotation Time (sec)	0.6	0.6	0.5		Rotation Time (sec)	0.5	
Pitch	0.85	0.85	1		Pitch	1.375:1	
Scan FOV	Large	Large	Large		Speed (mm/rot)	27.5	
CareDose4D	On	On	On		Scan FOV	Large Body	
Quality ref mAs	85	90	90		Auto mA range	100-500	
kVp	110				kVp	120	
ref kVp		120	120		Smart mA	On	
Optimize Slider position		3 w/o contrast	3 w/o contrast		Noise Index	15	
Optimize Slider position		7 w/ contrast	7 w/ contrast		ASIR	50%	
Arterial							
Kernel	I41f Medium +	I41f Medium	I41f Medium				
Window	CT Angio	Abdomen	Abdomen		Recon 1 Neutral/Post		
SAFIRE/ADMIRE	2	2	2		Algorithm	Standard	
Slice Thickness (mm)	2	2	1		Window Width/ Level	450/ 35	
Slice Increment (mm)	2	2	1		Slice Thickness (mm)	1.25	
Coronal/Sagittal					Slice Increment (mm)	1.25	
Kernel	I41f Medium +	I41f Medium	I41f Medium		Type	Plus	
Window	CT Angio	Mediastinum	Abdomen		ASIR	SS20	
SAFIRE/ADMIRE	2	2	2				
Slice Thickness (mm)	3	10	1		Recon 2 Reformats		
Slice Increment (mm)	3	2	1		Algorithm	Standard	
Reformat					Window Width/ Level	450/ 35	
Kernel	B10 Very Smooth	I26f Med Smooth	I30f Med Smooth		Slice Thickness (mm)	1.25	
Window	CT Angio	Abdomen	Abdomen		Slice Increment (mm)	0.625	
SAFIRE/ADMIRE	0	2	2		Type	Full	
Slice Thickness (mm)	1	1.5	0.75		ASIR	SS20	
Slice Increment (mm)	0.8	0.8	0.5				
					Recon Lung		
					Algorithm	Lung	
					Window Width/ Level	2000/-600	
					Slice Thickness (mm)	2.5	
					Slice Increment (mm)	2.5	
					Type	Full	
					ASIR	SS10	

CTDI: ~15-20 mGy per acquisition

Setup: **IV ACCESS TO BE OBTAINED IN ARM CONTRA-LATERAL TO PATIENT'S SYMPTOMS**

- Scan 1: Neutral Positioning- Supine, PA/Lateral Scout with both arms alongside body and head located medially
- Scan 2: Postural Positioning- Supine PA/Lateral Scout with both arms elevated above head and rotation of head to affected side

DFOV: Patient's width plus 4cm

Scan Range: Entire Aortic Root through C4

Scan Parameters:

- Neutral Arterial Scan to include entire aortic root through C4
- Neutral Venous Scan approximately **30-45 seconds after arterial scan**
- Bolus Tracking/Smart Prep scan trigger is set at 80 HU in the descending aorta just below aortic arch
 - 75ml of 350-370 mg iodine/ml non-ionic IV contrast @ 4 ml/sec at the discretion of the radiologist followed by 50ml normal saline @ 4 ml/sec ([See IV Catheter Guidelines](#))
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval
- Postural Arterial Scan to include entire aortic root through C4 (**to be done 5 minutes after first injection**)
- Postural Venous Scan approximately **30-45 seconds after arterial scan**
- Bolus Tracking/Smart Prep scan trigger is set at 80 HU in the descending aorta just below aortic arch
 - 75ml of 350-370 mg iodine/ml non-ionic IV contrast @ 4 ml/sec at the discretion of the radiologist followed by 50ml normal saline @ 4 ml/sec
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval

PACS series in order as performed:

- Topogram
- 1x1 Neutral Arterial/Venous Axial
- 1x1 Neutral Arterial/Venous Coronal/Sagittal thin MIP
- 3x3 Neutral Lung (focused FOV)
- 1x1 Postural Arterial/Venous Axial
- 1x1 Postural Arterial/Venous Coronal/Sagittal thin MIP
- 3x3 Postural Lung (focused FOV)
- Neutral/Postural VRT/MIP Rotations (3D)
- Patient Protocol/Dose Report

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THORACIC OUTLET CTA with VENOGRAM SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 0.6	16 x 1.2	64 x 0.6	Detector Coverage (mm)	20
Rotation Time (sec)	0.6	0.6	0.5	Rotation Time (sec)	0.5
Pitch	0.85	0.85	1	Pitch	1.375:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	27.5
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	85	90	90	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Arterial/Venous					
Kernel	I41f Medium +	I41f Medium	I41f Medium		
Window	CT Angio	Abdomen	CT Angio	Recon 1 Neutral/Post	
SAFIRE/ADMIRE	2	2	2	Algorithm	Standard
Slice Thickness (mm)	2	2	1	Window Width/ Level	450/ 35
Slice Increment (mm)	2	2	1	Slice Thickness (mm)	25
Coronal/Sagittal					
Kernel	I41f Medium +	I41f Medium	I41f Medium	Slice Increment (mm)	1.25
Window	CT Angio	Mediastinum	CT Angio	Type	Plus
SAFIRE/ADMIRE	2	2	2	ASIR	SS20
Slice Thickness (mm)	3	10	1	Recon 2 Reformats	
Slice Increment (mm)	3	2	1	Algorithm	Standard
Lung					
Kernel	I80s Very Sharp	I26f Med Smooth	I70f Very Sharp ASA	Window Width/ Level	450/ 35
Window	Lung	Abdomen	Lung	Slice Thickness (mm)	1.25
SAFIRE/ADMIRE	2	2	1	Slice Increment (mm)	0.625
Slice Thickness (mm)	3	1.5	3	Type	Full
Slice Increment (mm)	3	0.8	3	ASIR	SS20
Reformat					
Kernel	B10s Very Smooth	I26f Med Smooth	I30f Med Smooth	Recon Lung	
Window	CT Angio	Abdomen	CT Angio	Algorithm	Lung
SAFIRE/ADMIRE	0	2	2	Window Width/ Level	2000/-600
Slice Thickness (mm)	1	1.5	0.75	Slice Thickness (mm)	2.5
Slice Increment (mm)	0.8	0.8	0.5	Slice Increment (mm)	2.5
				Type	Full
				ASIR	SS10

**Protocol designed to minimize the amount of radiation while maximizing the yield and produce diagnostically acceptable image quality*

CTDI: ~15-20 mGy per acquisition

Setup:

- **IV ACCESS TO BE OBTAINED IN ARM CONTRA-LATERAL TO PATIENT'S SYMPTOMS**
- Supine, PA/Lateral Scout obtained with patient's symptomatic arm elevated above the head with palm facing up, rotation of head turned away from elevated side and contra-lateral arm remains alongside body

DFOV: Patient's width plus 4cm

Scan Parameters:

- Bolus Tracking/Smart Prep scan trigger is set at 100 HU in the descending aorta at the level of the aortic arch
- Arterial Phase from below the aortic root through the fingers
 - 100ml of 350-370 mg iodine/ml non-ionic IV contrast @ 4.5 ml/sec at the discretion of the radiologist followed by 50ml normal saline @ 4.5 ml/sec ([See IV Catheter Guidelines](#))
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval

PACS series in order as performed:

- Topogram
- 1x1 Arterial Axial
- 1x1 Coronal/Sagittal thin MIP
- MIP/VRT Rotations, Slab (3D)
- Patient Protocol/Dose Report

UPPER EXTREMITY CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64		Scanner	Optima 660
Scan Type	spiral	spiral	spiral		Scan Type	spiral
Detector Configuration	32 x 0.6	16 x 1.2	64 x 0.6		Detector Coverage (mm)	20
Rotation Time (sec)	0.6	0.6	0.5		Rotation Time (sec)	0.5
Pitch	0.85	0.85	1		Pitch	1.375:1
Scan FOV	Large	Large	Large		Speed (mm/rot)	27.5
CareDose4D	On	On	On		Scan FOV	Large Body
Quality ref mAs	120	90	90		Auto mA range	100-500
kVp	110				kVp	120
ref kVp		120	120		Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast		Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast		ASIR	50%
Arterial						
Kernel	B31s Med Smooth	I41f Medium	I41f Medium			
Window	CT Angio	Abdomen	Abdomen		Recon 1 Arterial	
SAFIRE/ADMIRE	0	2	2		Algorithm	Standard
Slice Thickness (mm)	1	2	1		Window Width/ Level	420/50
Slice Increment (mm)	1	2	1		Slice Thickness (mm)	1.25
Coronal/Sagittal					Slice Increment (mm)	1.25
Kernel	B31s Med Smooth	I41f Medium	I41f Medium		Type	Full
Window	CT Angio	Mediastinum	Abdomen		ASIR	None
SAFIRE/ADMIRE	0	2	2			
Slice Thickness (mm)	1	10	1		Recon 2 Reformats	
Slice Increment (mm)	1	2	1		Algorithm	Standard
Reformat					Window Width/ Level	500/50
Kernel	B31s Med Smooth	I26f Med Smooth	I30f Med Smooth		Slice Thickness (mm)	1.25
Window	CT Angio	Abdomen	Abdomen		Slice Increment (mm)	0.625
SAFIRE/ADMIRE	0	2	2		Type	Full
Slice Thickness (mm)	1	1.5	0.75		ASIR	None
Slice Increment (mm)	0.5	0.8	0.5			

CTDI: ≤ 20 mGy per acquisition

See [Patient Positioning](#) for additional information

Setup: Supine, PA/Lateral Scout from above the apices through the through toes

DFOV: Patient's width plus 4cm

≤99lbs	44kg	100mL
100-210lbs	45-95kg	150mL

Scan Parameters:

- Non-contrast above apices through aortic bifurcation
- Bolus Tracking/Smart Prep scan trigger is set at 120 HU in the descending aorta at the level of the carina
- Arterial Phase (see chart for IV contrast dosing) above diaphragm thru feet ([See IV Catheter Guidelines](#))
 - Injection rate of 4.5ml/sec of 350-370 mg iodine/ml non-ionic IV contrast at the discretion of the radiologist followed by 100ml normal saline @ 4.5 ml/sec
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval
- Venous Phase obtained 50 seconds after arterial above the diaphragm through the aortic bifurcation

• PACS series in order as performed:

- Topogram
- 2x2 Non-Contrast
- 2x2 Arterial Axial
- 10x2 Thin MIP Coronal/Sagittal Ch/Abd/Pel, Upper Leg, Lower Leg
- 2x2 Venous Axial
- MIP/VRT Rotations, Lower Leg Slabs (3D)
- Patient Protocol/Dose Report



Non-Contrast



Arterial Range



Venous Range

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WHOLE BODY with RUN OFF CTA SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64	Scanner	Optima 660
Scan Type	spiral	spiral	spiral	Scan Type	spiral
Detector Configuration	32 x 1.2	16 x 1.2	64 x 0.6	Detector Coverage (mm)	40
Rotation Time (sec)	0.6	0.6	0.5	Rotation Time (sec)	0.8
Pitch	0.6	0.85	1	Pitch	0.984:1
Scan FOV	Large	Large	Large	Speed (mm/rot)	39.37
CareDose4D	On	On	On	Scan FOV	Large Body
Quality ref mAs	90	90	90	Auto mA range	100-500
kVp	110			kVp	120
ref kVp		120	120	Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast	Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast	ASIR	50%
Non Contrast					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth		
Window	Abdomen	Abdomen	Abdomen	Recon 1 NonCon	
SAFIRE/ADMIRE	2	2	2	Algorithm	Standard
Slice Thickness (mm)	2	2	2	Window Width/ Level	450/ 35
Slice Increment (mm)	2	2	2	Slice Thickness (mm)	5
Arterial/Venous					
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth	Slice Increment (mm)	5
Window	Abdomen	Abdomen	Abdomen	Type	Full
SAFIRE/ADMIRE	2	2	2	ASIR	SS50
Slice Thickness (mm)	2	2	2	Recon Arterial/Venous	
Slice Increment (mm)	2	2	2	Algorithm	Soft
Lung					
Kernel	I31s Med Smooth	I70f Very Sharp ASA	B70f Very Sharp	Window Width/ Level	700/80
Window	Abdomen	Lung	Lung	Slice Thickness (mm)	2.5
SAFIRE/ADMIRE	2	1	0	Slice Increment (mm)	2.5
Slice Thickness (mm)	2	1.5	2	Type	Full
Reformat					
Kernel	I31s Med Smooth	I26f Med Smooth	I26f Med Smooth	ASIR	SS20
Window	Angio	Abdomen	Abdomen	Recon Reformat	
SAFIRE/ADMIRE	2	2	2	Algorithm	Soft
Slice Thickness (mm)	1.5	1.5	1.5	Window Width/ Level	700/80
Slice Increment (mm)	0.7	0.8	0.7	Slice Thickness (mm)	1.25
Cor/Sag MIP					
Kernel	I31s Med Smooth	I41f Medium	I41f Medium	Slice Increment (mm)	0.625
Window	Angio	Mediastinum	Abdomen	Type	Full
SAFIRE/ADMIRE	2	2	2	ASIR	SS20
Slice Thickness (mm)	10	10	10	Recon Lung	
Slice Increment (mm)	2	2	2	Algorithm	Lung
Slice Increment (mm)	2	1.5	2	Window Width/ Level	2000/-600
				Slice Thickness (mm)	2.5
				Slice Increment (mm)	2.5
				Type	Full
				ASIR	SS10

*Protocol designed to minimize the amount of radiation while maximizing the yield and produce diagnostically acceptable image quality

Setup: **IV ACCESS TO BE OBTAINED IN ARM CONTRA-LATERAL TO PATIENT'S SYMPTOMS**

DFOV: Patient's width plus 4cm

Scan Range: Entire Aortic Root through C4

Scan Parameters:

- 75ml of 350-370 mg iodine/ml non-ionic IV contrast @ 4 ml/sec at the discretion of the radiologist followed by 50ml normal saline @ 4 ml/sec ([See IV Catheter Guidelines](#))
- Venous scan start at 90 second delay

PACS series in order as performed:

- Topograms
- 1x1 Venous Axial
- 1x1 Venous Coronal/Sagittal thin MIP
- 3x3 Lung (focused FOV)
- Patient Protocol/Dose Report

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VENOGRAM CHEST SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64		Scanner	Optima 660
Scan Type	spiral	spiral	spiral		Scan Type	spiral
Detector Configuration	32 x 0.6	16 x 1.2	64 x 0.6		Detector Coverage (mm)	20
Rotation Time (sec)	0.6	0.6	0.5		Rotation Time (sec)	0.5
Pitch	0.85	0.85	1		Pitch	1.375:1
Scan FOV	Large	Large	Large		Speed (mm/rot)	27.5
CareDose4D	On	On	On		Scan FOV	Large Body
Quality ref mAs	85	90	90		Auto mA range	100-500
kVp	110				kVp	120
ref kVp		120	120		Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast		Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast		ASIR	50%
Arterial/Venous						
Kernel	I41f Medium +	I41f Medium	I41f Medium			
Window	CT Angio	Abdomen	CT Angio		Recon 1 Neutral/Post	
SAFIRE/ADMIRE	2	2	2		Algorithm	Standard
Slice Thickness (mm)	2	2	1		Window Width/ Level	450/ 35
Slice Increment (mm)	2	2	1		Slice Thickness (mm)	25
Coronal/Sagittal						
Kernel	I41f Medium +	I41f Medium	I41f Medium		Slice Increment (mm)	1.25
Window	CT Angio	Mediastinum	CT Angio		Type	Plus
SAFIRE/ADMIRE	2	2	2		ASIR	SS20
Slice Thickness (mm)	3	10	1			
Slice Increment (mm)	3	2	1		Recon 2 Reformats	
Lung						
Kernel	I80s Very Sharp	I26f Med Smooth	I70f Very Sharp ASA		Algorithm	Standard
Window	Lung	Abdomen	Lung		Window Width/ Level	450/ 35
SAFIRE/ADMIRE	2	2	1		Slice Thickness (mm)	1.25
Slice Thickness (mm)	3	1.5	3		Slice Increment (mm)	0.625
Slice Increment (mm)	3	0.8	3		Type	Full
Reformat						
Kernel	B10s Very Smooth	I26f Med Smooth	I30f Med Smooth		ASIR	SS20
Window	CT Angio	Abdomen	CT Angio		Recon Lung	
SAFIRE/ADMIRE	0	2	2		Algorithm	Lung
Slice Thickness (mm)	1	1.5	0.75		Window Width/ Level	2000/-600
Slice Increment (mm)	0.8	0.8	0.5		Slice Thickness (mm)	2.5
					Slice Increment (mm)	2.5
					Type	Full
					ASIR	SS10

**Protocol designed to minimize the amount of radiation while maximizing the yield and produce diagnostically acceptable image quality*

VENOGRAM UPPER EXTREMITY-- 5/15/2025

CTDI: ~15-20 mGy per acquisition

Setup:

- **IV ACCESS TO BE OBTAINED IN ARM CONTRA-LATERAL TO PATIENT'S SYMPTOMS**
- Supine, PA/Lateral Scout obtained with patient's symptomatic arm elevated above the head with palm facing up, rotation of head turned away from elevated side and contra-lateral arm remains alongside body

DFOV: Patient's width plus 4cm

Scan Parameters:

- Venous Phase from below the aortic root through the fingers
 - 75ml of 350-370 mg iodine/ml non-ionic IV contrast @ 3.0 ml/sec at the discretion of the radiologist followed by 60 SECOND PAUSE, 25ml of 350-370 mg iodine/ml non-ionic IV contrast followed by 50ml normal saline @ 3.0 ml/sec (approx. 110 sec delay) ([See IV Catheter Guidelines](#))
 - IV contrast volumes are based on patients with a normal GFR, do not exceed 150ml without radiologist approval
- Venous scan start at 110 second delay

PACS series in order as performed:

- Topogram
- 1x1 Venous Axial
- 1x1 Coronal/Sagittal thin MIP
- MIP/VRT Rotations, Slab (3D)
- Patient Protocol/Dose Report

[*Back to CTA Protocol Page*](#)

VENOGRAM UPPER EXTREMITY SCAN PROTOCOL

Scanner	Perspective	Definition AS 40	Definition AS 64		Scanner	Optima 660
Scan Type	spiral	spiral	spiral		Scan Type	spiral
Detector Configuration	32 x 0.6	16 x 1.2	64 x 0.6		Detector Coverage (mm)	20
Rotation Time (sec)	0.6	0.6	0.5		Rotation Time (sec)	0.5
Pitch	0.85	0.85	1		Pitch	1.375:1
Scan FOV	Large	Large	Large		Speed (mm/rot)	27.5
CareDose4D	On	On	On		Scan FOV	Large Body
Quality ref mAs	120	90	90		Auto mA range	100-500
kVp	110				kVp	120
ref kVp		120	120		Smart mA	On
Optimize Slider position		3 w/o contrast	3 w/o contrast		Noise Index	15
Optimize Slider position		7 w/ contrast	7 w/ contrast		ASIR	50%
Arterial						
Kernel	B31s Med Smooth	I41f Medium	I41f Medium			
Window	CT Angio	Abdomen	Abdomen		Recon 1 Arterial	
SAFIRE/ADMIRE	0	2	2		Algorithm	Standard
Slice Thickness (mm)	1	2	1		Window Width/ Level	420/50
Slice Increment (mm)	1	2	1		Slice Thickness (mm)	1.25
Coronal/Sagittal					Slice Increment (mm)	1.25
Kernel	B31s Med Smooth	I41f Medium	I41f Medium		Type	Full
Window	CT Angio	Mediastinum	Abdomen		ASIR	None
SAFIRE/ADMIRE	0	2	2			
Slice Thickness (mm)	1	10	1		Recon 2 Reformats	
Slice Increment (mm)	1	2	1		Algorithm	Standard
Reformat					Window Width/ Level	500/50
Kernel	B31s Med Smooth	I26f Med Smooth	I30f Med Smooth		Slice Thickness (mm)	1.25
Window	CT Angio	Abdomen	Abdomen		Slice Increment (mm)	0.625
SAFIRE/ADMIRE	0	2	2		Type	Full
Slice Thickness (mm)	1	1.5	0.75		ASIR	None
Slice Increment (mm)	0.5	0.8	0.5			

