Austin Radiological Association

CTA Protocols

Questions?

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PROTOCOLS

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

ARA DIAGNOSTIC IMAGING

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
BD Nexiva Diffusics		
24g	Less than or equal to 2cc/sec	325
22g	Less than 4cc/sec	325
20g	Greater than 4cc/sec	325
B Braun Safety Introcan		
24g	HAND INJECTION ONLY	
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
B Braun Safety 3 Introcan		
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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ARA DIAGNOSTIC IMAGING

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

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ABDOMEN PELVIS CTA-Revised-4/22/2020

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

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					Slice Increment (mm)	2.5
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		**Recon Arterial/Venous**	
Slice Increment (mm)	2	2	2		Algorithm	Standard
Reformat					Window Width/ Level	400/40
Kernel	I30s Med Smooth	I41s Medium	I30f Med Smooth		Slice Thickness (mm)	2.5
Window	CT Angio	Abdomen	Abdomen		Slice Increment (mm)	2.5
SAFIRE/ADMIRE	2	2	2		Type	Full
Slice Thickness (mm)	1.5	0.75	0.75		ASIR	SS20
Slice Increment (mm)	0.7	0.5	0.5			
Cor/Sag MIP					**Recon Reformat**	
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth		Algorithm	Standard
Window	CT Angio	Mediastinum	Abdomen		Window Width/ Level	450/35
SAFIRE/ADMIRE	2	2	2		Slice Thickness (mm)	1.25
Slice Thickness (mm)	10	10	10		Slice Increment (mm)	0.625
Slice Increment (mm)	2	2	2		Type	Full
Cor/Sag MPR					ASIR	SS20
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth			
Window	CT Angio	Abdomen	Abdomen			
SAFIRE/ADMIRE	2	2	2			
Slice Thickness (mm)	2	2	2			
Slice Increment (mm)	2	2	2			

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

ABDOMEN CTA- Revised-4/22/2020

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

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					Slice Increment (mm)	2.5
Kernel	I31s Med Smooth	I41f Medium	I41f Medium		Type	Full
Window	Abdomen	Abdomen	Abdomen		ASIR	SS20
SAFIRE/ADMIRE	2	2	2			
Slice Thickness (mm)	2	2	2		**Recon 2 Arterial/Venous**	
Slice Increment (mm)	2	2	2		Algorithm	Standard
Reformat					Window Width/ Level	400/40
Kernel	I30s Med Smooth	I26f Med Smooth	I30f Med Smooth		Slice Thickness (mm)	2.5
Window	CT Angio	Abdomen	Abdomen		Slice Increment (mm)	2.5
SAFIRE/ADMIRE	2	3	2		Type	Full
Slice Thickness (mm)	1.5	1.5	1		ASIR	SS20
Slice Increment (mm)	0.7	0.8	0.7			
Cor/Sag MIP					**Recon 2 Reformat**	
Kernel	I31s Med Smooth	I41f Medium	I41f Medium		Algorithm	Standard
Window	CT Angio	Mediastinum	Abdomen		Window Width/ Level	450/35
SAFIRE/ADMIRE	2	2	2		Slice Thickness (mm)	1.25
Slice Thickness (mm)	10	10	10		Slice Increment (mm)	0.625
Slice Increment (mm)	2	2	2		Type	Full
Cor/Sag MPR					ASIR	SS20
Kernel	I31s Med Smooth	I41f Medium	I41f Medium			
Window	CT Angio	Abdomen	Abdomen			
SAFIRE/ADMIRE	2	2	2			
Slice Thickness (mm)	2	2	2			
Slice Increment (mm)	2	2	2			

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

ABDOMEN PELVIS with RUNOFF CTA- Revised-4/22/2020

CTDI: ≤ 20 mGy per acquisition

See Patient Positioning for additional information

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

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

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					Slice Increment (mm)	2.5
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth		Type	Full
Window	Abdomen	Abdomen	Abdomen		ASIR	SS50
SAFIRE/ADMIRE	2	2	2			
Slice Thickness (mm)	2	2	2		**Recon 2 Arterial/Venous**	
Slice Increment (mm)	2	2	2		Algorithm	Soft
Reformat					Window Width/ Level	700/80
Kernel	B10s Very Smooth	I26f Med Smooth	I26f Med Smooth		Slice Thickness (mm)	2.5
Window	CT Angio	Abdomen	Abdomen		Slice Increment (mm)	2.5
SAFIRE/ADMIRE	0	2	2		Type	Full
Slice Thickness (mm)	1.5	1.5	1.5		ASIR	SS20
Slice Increment (mm)	0.7	0.8	0.7			
Cor/Sag MIP					**Recon 3 Reformat**	
Kernel	I31s Med Smooth	I41f Medium	I41f Medium		Algorithm	Soft
Window	CT Angio	Mediastinum	Abdomen		Window Width/ Level	700/80
SAFIRE/ADMIRE	2	2	2		Slice Thickness (mm)	1.25
Slice Thickness (mm)	10	10	10		Slice Increment (mm)	0.625
Slice Increment (mm)	2	2	2		Type	Full
Venous					ASIR	SS20
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			

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

ABDOMEN PELVIS with LOWER EXTREMITY VENOGRAM- Revised-4/23/2020

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

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					Slice Increment (mm)	2.5
Kernel	I30s Med Smooth	I41f Medium	I41f Medium		Type	Full
Window	CT Angio	Mediastinum	Abdomen		ASIR	SS20
SAFIRE/ADMIRE	2	2	2			
Slice Thickness (mm)	10	10	10		**Recon 2 Reformats**	
Slice Increment (mm)	2	2	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	0.75	0.75		ASIR	SS20
Slice Increment (mm)	0.8	0.5	0.5			

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

ABDOMINAL PERFORATOR CTA- Revised-11/30/2022

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

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					Slice Increment (mm)	1.25
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)	10	10	10		**Recon 2 Reformats**	
Slice Increment (mm)	1	1	1		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	0.6	0.5			

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

ABDOMINAL PERFORATOR CTA-DR HABASH- Revised-11/30/2022

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

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

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					Slice Increment (mm)	2.5
Kernel	B31 s Med Smooth	I41f Medium	I31f Med Smooth		Type	Plus
Window	CT Angio	Mediastinum	Abdomen		ASIR	None
SAFIRE/ADMIRE	0	2	2			
Slice Thickness (mm)	10	10	10		**Recon 2 Reformats**	
Slice Increment (mm)	3	3	3		Algorithm	Standard
Coronal Arterial/Venous					Window Width/ Level	450/ 35
Kernel	B31 s Med Smooth	I41f Medium	I31f 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)	10	10	10		ASIR	SS50
Slice Increment (mm)	1	1	1			
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			

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

ABDOMINAL PERFORATOR CTA- DR POTTER- Revised-11/30/2022

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

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					Slice Increment (mm)	2.5
Kernel	B31s Med Smooth	I41f Medium	I31f Med Smooth		Type	Plus
Window	CT Angio	Mediastinum	Abdomen		ASIR	None
SAFIRE/ADMIRE	0	2	2			
Slice Thickness (mm)	10	10	10		**Recon 2 Reformats**	
Slice Increment (mm)	3	3	3		Algorithm	Standard
Coronal Arterial/Venous					Window Width/ Level	450/ 35
Kernel	B31s Med Smooth	I41f Medium	I31f 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)	10	10	10		ASIR	SS50
Slice Increment (mm)	1	1	1			
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			

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

ABDOMINAL PERFORATOR CTA-SRINIVASA PROTOCOL- Revised-11/30/2022

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

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			

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

DIAGNOSTIC IMAGING

CHEST ABDOMEN PELVIS CTA- Revised-4/22/2020

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

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					Slice Increment (mm)	2.5
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth		Type	Plus
Window	CT Angio	Mediastinum	Abdomen		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	450/ 35
Kernel	I31s Med Smooth	I41f Medium	I31f 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	2	2		ASIR	SS20
Slice Increment (mm)	2	2	2			
Lung					**Recon Lung**	
Kernel	I80s Very Sharp	I70f Very Sharp ASA	B70f Very Sharp		Algorithm	Lung
Window	Lung	Lung	Lung		Window Width/ Level	2000/-600
SAFIRE/ADMIRE	2	1	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	I30f Med Smooth	I30f Med Smooth			
Window	CT Angio	Abdomen	Abdomen			
SAFIRE/ADMIRE	2	3	2			
Slice Thickness (mm)	1.5	1.5	0.75			
Slice Increment (mm)	0.7	0.8	0.5			

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

ARA DIAGNOSTIC IMAGING

CHEST CTA- Revised-4/22/2020

CTDI: ≤ 20 mGy per acquisition

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

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					Slice Increment (mm)	2.5
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					Window Width/ Level	700/80
Kernel	I31s Med Smooth	I41f Medium	I31f Med Smooth		Slice Thickness (mm)	1.25
Window	CT Angio	Abdomen	CTA PE		Slice Increment (mm)	0.625
SAFIRE/ADMIRE	2	2	2		Type	Full
Slice Thickness (mm)	2	2	2		ASIR	SS20
Slice Increment (mm)	2	2	2			
Lung					**Recon 2 Lung**	
Kernel	I80s Very Sharp	I70f Very Sharp ASA	B70f Very Sharp		Algorithm	Lung
Window	Lung	Lung	Lung		Window Width/ Level	2000/-600
SAFIRE/ADMIRE	1	1	0		Slice Thickness (mm)	2.5
Slice Thickness (mm)	2	1.5	2		Slice Increment (mm)	2.5
Slice Increment (mm)	2	1.5	2		Type	Full
Reformat					ASIR	SS10
Kernel	I30s Med Smooth	I30f Med Smooth	I30f Med Smooth			
Window	CT Angio	Mediastinum	CTA PE			
SAFIRE/ADMIRE	2	2	2			
Slice Thickness (mm)	1.5	1.5	1			
Slice Increment (mm)	0.7	0.8	0.5			

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

CHEST FOR PE - Revised-4/22/2020

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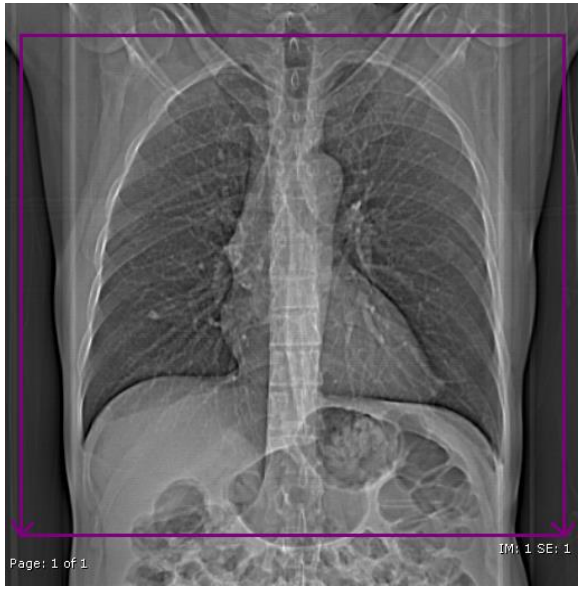
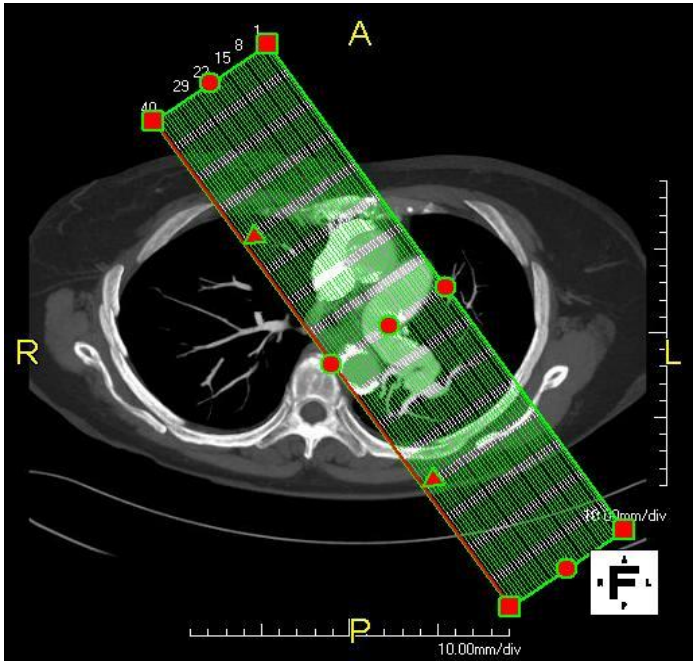
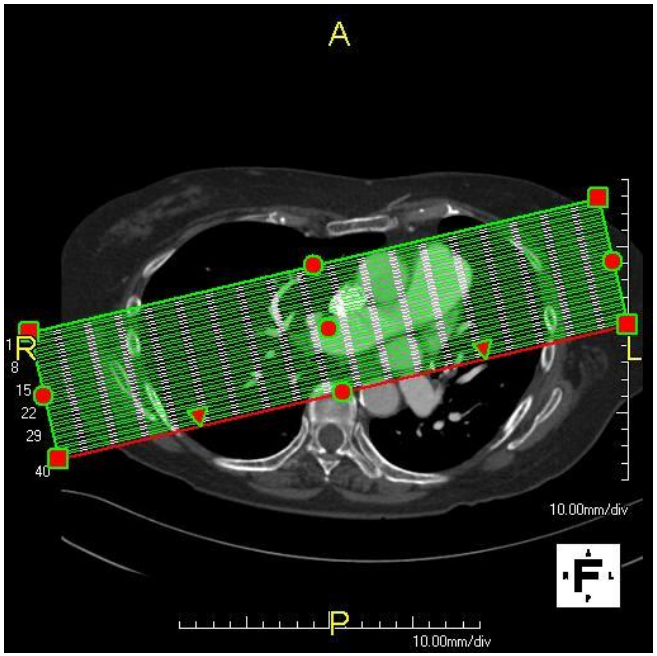
Protocol designed to minimize the amount of radiation while maximizing the yield and produce diagnostically acceptable image quality





10x2 Left Oblique MIP



10x2 Right Oblique MIP

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

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			

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

CHEST FOR PE PREGNANT FEMALE- Revised-4/22/2020

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

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					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 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			

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

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 one syringe of 180ml normal saline and one syringe of 100ml Visipaque 320

All injections will be at rate of 5ml/sec

ACQUISITION PARAMETERS

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

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

ARA DIAGNOSTIC IMAGING

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.
    - Test Dose is used to determine the delay for the CCTA
        - Test dose scan should be performed slightly below the carina with a focus on the ascending aorta.
        - An injection of 20ml Visipaque 320 and 50ml normal saline will be administered
        - The test dose images will be acquired after a 10 second scan delay and will be acquired until a drop in the peak enhancement of the ascending aorta.
        - These images are then loaded into Dynamic evaluation.
        - Set a 10 second delay in the dynamic evaluation card
        - Choose the elliptical ROI button and draw an ROI in the Ascending Aorta
        - Add 4 seconds to the time to peak and you will have the necessary delay for the CCTA

  When evaluating a post bypass graft patient it not necessary to add the 4 second handling delay.

- Coronary CTA scan should start at the level of the carina and extend to below the base of the heart.

  Start the scan above the level of the clavicles when evaluating a post bypass graft.

  After the pre-determined scan delay is set the contrast injection of 80ml Visipaque 320 and the scan will start simultaneously.

  With approx. 10-15 seconds left on the scan delay the patient will be given full inspiration breath hold instructions

  *****CLEERLY-notify management to upload before PT leaves, Do not include 3D****

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

ARA DIAGNOSTIC IMAGING

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)

  1 mm slice increment x 1 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

  1.5 mm slice increment x 1 mm slice thickness

  SAFIRE- 2

  Kernel- I26f medium Smooth

  Used to perform right ventricular ejection fraction

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

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)	1
Slice Increment (mm)	1
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)	1.5
Slice Increment (mm)	1

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

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
-

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

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

Back to CTA Protocol Page

ARA DIAGNOSTIC IMAGING

DISSECTION CTA- Revised-06/24/2021

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

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

DIAGNOSTIC IMAGING

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

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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					Slice Increment (mm)	2.5
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					Window Width/ Level	400/60
Kernel	I41s Medium +	I41f Medium	I41f Medium		Slice Thickness (mm)	1.25
Window	CT Angio	Mediastinum	CTA PE		Slice Increment (mm)	1.25
SAFIRE/ADMIRE	2	2	2		Type	Full
Slice Thickness (mm)	10	10	10		ASIR	SS20
Slice Increment (mm)	3	2	3			
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	2	2	0		Slice Thickness (mm)	2.5
Slice Thickness (mm)	3	2	3		Slice Increment (mm)	2.5
Slice Increment (mm)	3	2	3		Type	Full
Reformat					ASIR	SS10
Kernel	B10s Very Smooth	I41f Medium	I30f Med Smooth			
Window	CT Angio	Abdomen	CTA PE			
SAFIRE/ADMIRE	0	2	2			
Slice Thickness (mm)	1	0.6	1			
Slice Increment (mm)	0.8	0.6	1			

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

ENTEROGRAPHY/SMALL BOWEL CTA- Revised-4/22/2020

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

Back to CTA Protocol Page

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

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			

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

GI BLEED CTA- Revised-10/23/2023

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
- 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
- 1.25x1.25 (1x1 Siemens) Non-Contrast Coronal MPR
- 1.25x1.25 (1x1 Siemens) Arterial Axial
- 1.25x1.25 (1x1 Siemens) Arterial Coronal/Sagittal MPR
- 10x1.25 (10x1 Siemens) Arterial Coronal/Sagittal thin MIP
- MIP/VRT Rotations (3D)
- 5x5 Delay Axial
    1. 1.25x1.25(1x1 Siemens) Delay Coronal/Sagittal MPR
- Patient Protocol/Dose Report

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

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						
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)	1	1	1		Algorithm	Standard
Slice Increment (mm)	1	1	1		Window Width/ Level	450/ 35
Coronal/ Sagittal					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			

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

PELVIS CTA- Revised-4/16/2019

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

Back to CTA Protocol Page

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

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					Slice Increment (mm)	2.5
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)	10	5	10		**Recon 2 Reformats**	
Slice Increment (mm)	2	5	2		Algorithm	Standard
Reformat					Window Width/ Level	700/80
Kernel	I30s Med Smooth	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)	1.5	5	1		ASIR	SS20
Slice Increment (mm)	1	5	0.7			

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

PELVIS FOR PROSTATE ARTERY CTA- Revised-4/16/2019

KYLE and MID only

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

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					

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

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

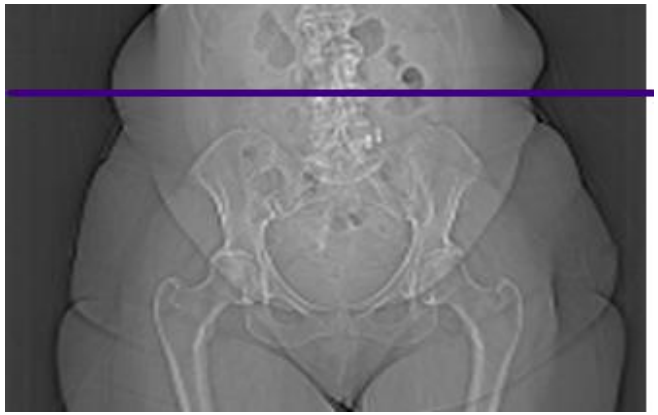
Scan Parameters:

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

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			

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

PELVIS with RUNOFF CTA- Revised-4/16/2018

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

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				

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

PULMONARY VEIN CTA- Revised-4/16/2019

MID only

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

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

ARA DIAGNOSTIC IMAGING

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

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

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*

THORACIC OUTLET CTA- Revised-2/28/2022

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

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	

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

THORACIC OUTLET CTA with VENOGRAM- Revised-2/28/2022

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

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					Slice Increment (mm)	1.25
Kernel	I41f Medium +	I41f Medium	I41f Medium		Type	Plus
Window	CT Angio	Mediastinum	CT Angio		ASIR	SS20
SAFIRE/ADMIRE	2	2	2			
Slice Thickness (mm)	3	10	1		**Recon 2 Reformats**	
Slice Increment (mm)	3	2	1		Algorithm	Standard
Lung					Window Width/ Level	450/ 35
Kernel	I80s Very Sharp	I26f Med Smooth	I70f Very Sharp ASA		Slice Thickness (mm)	1.25
Window	Lung	Abdomen	Lung		Slice Increment (mm)	0.625
SAFIRE/ADMIRE	2	2	1		Type	Full
Slice Thickness (mm)	3	1.5	3		ASIR	SS20
Slice Increment (mm)	3	0.8	3			
Reformat					**Recon Lung**	
Kernel	B10s Very Smooth	I26f Med Smooth	I30f Med Smooth		Algorithm	Lung
Window	CT Angio	Abdomen	CT Angio		Window Width/ Level	2000/-600
SAFIRE/ADMIRE	0	2	2		Slice Thickness (mm)	2.5
Slice Thickness (mm)	1	1.5	0.75		Slice Increment (mm)	2.5
Slice Increment (mm)	0.8	0.8	0.5		Type	Full
					ASIR	SS10

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

UPPER EXTREMITY CTA- Revised-4/16/2019

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

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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			

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

WHOLE BODY with RUNOFF CTA - Revised- 4/22/2020

MID only

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

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

WHOLE BODY with RUNOFF CTA

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
Scan Type	spiral	spiral	spiral
Detector Configuration	32 x 1.2	16 x 1.2	64 x 0.6
Rotation Time (sec)	0.6	0.6	0.5
Pitch	0.6	0.85	1
Scan FOV	Large	Large	Large
CareDose4D	On	On	On
Quality ref mAs	90	90	90
kVp	110		
ref kVp		120	120
Optimize Slider position		3 w/o contrast	3 w/o contrast
Optimize Slider position		7 w/ contrast	7 w/ contrast
Non Contrast			
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
Arterial/Venous			
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
Lung			
Kernel	I31s Med Smooth	I70f Very Sharp ASA	B70f Very Sharp
Window	Abdomen	Lung	Lung
SAFIRE/ADMIRE	2	1	0
Slice Thickness (mm)	2	1.5	2
Reformat			
Kernel	I31s Med Smooth	I26f Med Smooth	I26f Med Smooth
Window	Angio	Abdomen	Abdomen
SAFIRE/ADMIRE	2	2	2
Slice Thickness (mm)	1.5	1.5	1.5
Slice Increment (mm)	0.7	0.8	0.7
Cor/Sag MIP			
Kernel	I31s Med Smooth	I41f Medium	I41f Medium
Window	Angio	Mediastinum	Abdomen
SAFIRE/ADMIRE	2	2	2
Slice Thickness (mm)	10	10	10
Slice Increment (mm)	2	2	2
Slice Increment (mm)	2	1.5	2

Scanner	Optima 660
Scan Type	spiral
Detector Coverage (mm)	40
Rotation Time (sec)	0.8
Pitch	0.984:1
Speed (mm/rot)	39.37
Scan FOV	Large Body
Auto mA range	100-500
kVp	120
Smart mA	On
Noise Index	15
ASIR	50%
Recon 1 NonCon	
Algorithm	Standard
Window Width/ Level	450/ 35
Slice Thickness (mm)	5
Slice Increment (mm)	5
Type	Full
ASIR	SS50
Recon Arterial/Venous	
Algorithm	Soft
Window Width/ Level	700/80
Slice Thickness (mm)	2.5
Slice Increment (mm)	2.5
Type	Full
ASIR	SS20
Recon Reformat	
Algorithm	Soft
Window Width/ Level	700/80
Slice Thickness (mm)	1.25
Slice Increment (mm)	0.625
Type	Full
ASIR	SS20
Recon Lung	
Algorithm	Lung
Window Width/ Level	2000/-600
Slice Thickness (mm)	2.5
Slice Increment (mm)	2.5
Type	Full
ASIR	SS10

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Protocol Review

CT Protocols are reviewed by the Radiation Safety Protocol Committee.

Committee members consists of ARA Radiation Safety Officer, Radiologists, ARA Outpatient Imaging Center Directors, Manager of Quality, Safety and Risk Management and Lead CT Technologists

Protocol(s) Review Date
09/04/2024

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