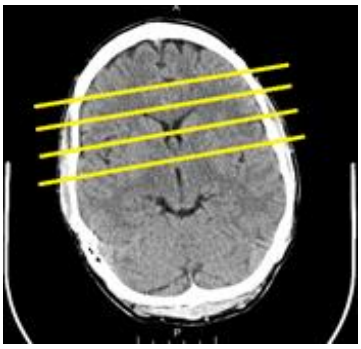
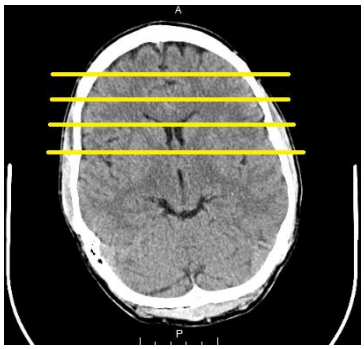
CT General Comments

1. Make reconstructions relative to the patient, not the scanner. (See Fig. A)

Fig. A



YES

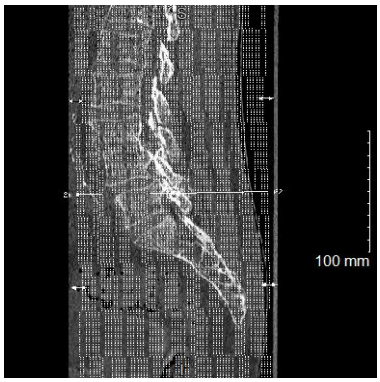


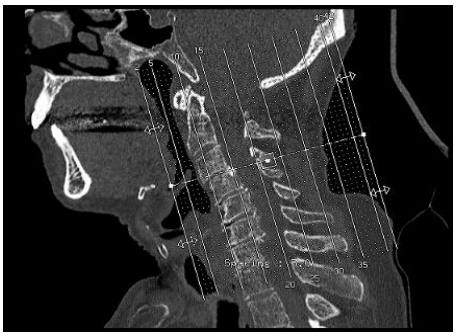
NO

2. Position the patient to eliminate the need for a gantry tilt, when possible.

3. When creating sagittal and coronal reconstructions, do NOT send the additional image showing the plane of the reconstructions to PACS, if possible. If your scanner sends this image automatically, delete from PACS before marking the study as Reviewed. (See Fig. B)

Fig. B





4. All Bone Algorithm reconstructions should be created using a sharp bone algorithm, not smooth bone. This may be called Bone Plus, etc. depending on the machine.

5. Adult oral contrast for CT should be mixed at a ratio of 50 mL of water soluable contrast (Omnipaque 300 or equivalent water soluble contrast) per 1000 mL of liquid OR 1000mL Ready to Drink (RTD) Omnipaque Oral Solution 12mg/mL 500mL jugs (premixed contrast agent - no dilution necessary). CT Barium may be utilized, if indicated.

6. Pediatric oral contrast for CT - Please refer to CT Oral Contrast Volumes - Pediatric Guidelines posted online.

Continued on next page

Reviewed by Drs. Holdsworth, Steinberg, King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT General Comments Cont.

7. Protocols state Omnipaque for IV contrast. You may substitute other equivalent water soluble contrast brands such as those below.

GE Healthcare	Clinical Equivalent	Bracco
Omnipaque 300 mg/mL (Iohexal)	Clinical Equivalent	Isovue 300 mg/mL (Iopamidol)
Omnipaque 350 mg/mL (Iohexal)	Clinical Equivalent	Isovue 370 mg/mL (Iopamidol)

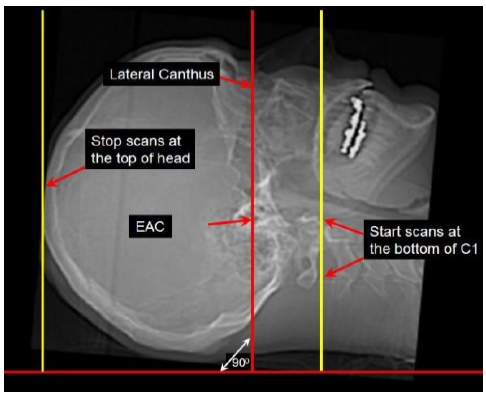
8. IV contrast for pediatric patients (17 years and younger) should be administered according to the following weight based guidelines: 1 mL/pound, up to a maximum dose of 80 mL

Reviewed by Drs. Holdsworth, Steinberg, King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Head

Anatomical Reference:	Orbitomeatal
Patient Position:	Supine; Tilt the patient's head so that the orbitomeatal line is perpendicular to the CT tabletop (see image).
Patient Orientation:	Head First
Scan Range:	C1 through vertex
Scout:	Lateral, AP if necessary
Scan Type:	Helical
Rotation Time:	0.9
Thickness:	5mm, Recon as thin as possible
Interval:	5mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Head
kVp:	120
mAs:	Auto mA
Scan Delay:	60 seconds, if contrast used
Respiration:	None
DFOV:	25
Recon Algorithm:	See comments below
Contrast:	80 mL Omnipaque 300 mg/mL or equivalent water soluble contrast @ 1.5-3 mL/sec
Comments:	1. Send 5 mm Soft Tissue Algorithm Axial Images to PACS 2. Send 1 mm Soft Tissue Algorithm Axial Images to PACS 3. Send 2 mm Bone Algorithm Axial Images to PACS 4. Send 3mm Sagittal and Coronal Soft Tissue Algorithm Reconstructions to PACS 5. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)



* Image courtesy of University of Wisconsin

Indications

Without Contrast:	Trauma, Stroke Symptoms, Headache, Seizure, Altered Mental Status
With and Without Contrast:	Tumor, Infection AND unable to have MRI, Abnormal Non-Contrast CT

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Holdsworth 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Perfusion Single Slab

Performed at IMMC & *ILH Only

	IMMC	ILH
Scanner:	**Siemens Edge/Flash**	**GE Discovery CT750 HD**
Detector Width:	38.4	40
Detector Rows:	32 x 1.2 mm	64
Mode:	Helical	Axial
Acq Type:	VPCT	Shuttle
Scan Delay:	5 second	5 second
Tube Voltage (kVp)	70	80
Tube Current (mA)	350	500
Exposure Time:	570	400
Exposure (mAs):	200	200
Interval (mm):	96	40
Slice Thickness:	10	5
Slice Increment:	10	5
Beam Collimation:	38.4	40
Number of Cycles:	44	24
Recon FoV:	220 mm	22 cm
Recon Kernel:	H20f Smooth	Standard

Contrast: IV: 40 mL Omnipaque 350 mg/mL or equivalent water soluble contrast at 5 mL/sec + 40 mL of Saline chase at 5 mL/sec

Wait 2 Minutes

CTA Head and Neck - Follow posted online protocol

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Holdsworth 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Perfusion Dual Slab

Performed at *ILH & MWH Only

		ILH	MWH
Scanner:		**Siemens Edge**	**Siemens AS 64**
Detector Width:		38.4 - per slab	19.2 mm
Detector Rows:		32 x 1.2 mm	16 x 1.2 mm
Mode:		Helical	Axial
Acq Type:		VPCT	NeuroPCT
Scan Delay:		5 second	5 second
Tube Voltage (kVp)		80	80
Tube Current (mA)		350	85
Exposure Time:		570	1 second
Exposure (mAs):		110	85
Interval (mm):		0 mm	0 mm
Slice Thickness:		10	10
Slice Increment:		9.6	4.5
Beam Collimation:		38.4	19.2 mm
Number of Cycles:		44	65
Recon FoV:		220 mm	22 cm
Recon Kernel:		H20f Smooth	H20f Smooth

Contrast: IV:

1st Perfusion Run: 40 mL Omnipaque 350 mg/mL or equivalent water soluble contrast at 5 mL/sec + 40 mL of Saline chase at 5 mL/sec

Wait 2 Minutes

2nd Perfusion Run: 40 mL Omnipaque 350 mg/mL or equivalent water soluble contrast at 5 mL/sec + 40 mL of Saline chase at 5 mL/sec

Wait 2 Minutes

CTA Head and Neck - Follow posted online protocol

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Holdsworth 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Head

Venogram

Anatomical Reference:	Orbitomeatal
Patient Position:	Supine; Tilt the patient's head so that the orbitomeatal line is perpendicular to the CT tabletop (see CT Head protocol).
Patient Orientation:	Head First
Scan Range:	C-1 through vertex
Scout:	Lateral, AP if necessary
Scan Type:	Helical
Rotation Time:	0.9
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Head
kVp:	120
mAs:	Auto mA
Scan Delay:	Smart Prep (ROI-Aorta) - Start scan 5 seconds after contrast arrival in aorta Scan a 2nd series immediately after completion of the first series.
Respiration:	Inspiration
DFOV:	25
Recon Algorithm:	Standard
Contrast:	80 mL Omnipaque 300 mg/mL or equivalent water soluble contrast @ 2-3 mL/sec
Comments:	1. Send 5 mm Soft Tissue Algorithm Axial Images to PACS 2. Send 1 mm Soft Tissue Algorithm Axial Images to PACS 3. Send 3mm Sagittal and Coronal Soft Tissue Algorithm Reconstructions to PACS 4. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With Contrast:	Venous Sinus Thrombosis, Headache

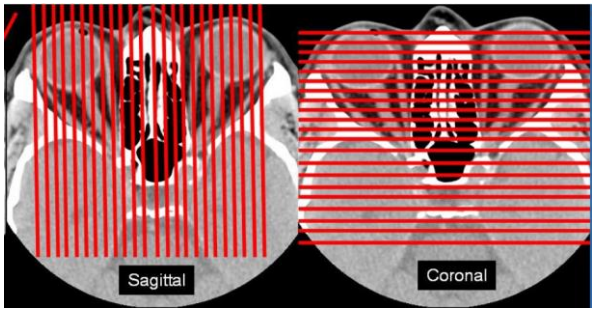
****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Holdsworth 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Orbits

Anatomical Reference:	Orbitomeatal
Patient Position:	Supine; Tilt the patient's head so that the orbitomeatal line is perpendicular to the CT tabletop (see CT Head protocol).
Patient Orientation:	Head First
Scan Range:	Maxilla through Orbits
Scout:	Lateral
Scan Type:	Helical
Rotation Time:	0.9
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Head
kVp:	120
mAs:	Auto mA
Scan Delay:	60 seconds, if contrast used
Respiration:	None
DFOV:	15cm
Recon Algorithm:	See comments below
Contrast:	80 mL Omnipaque 300 mg/mL or equivalent water soluble contrast @ 2-3 mL/sec
Comments:	1. Send 1 mm Bone Algorithm Axial Images to PACS 2. Send 3 mm Soft Tissue Algorithm Axial Images to PACS 3. Send 2 mm Bone Algorithm Sagittal and Coronal Reconstructions to PACS 4. Send 2 mm Soft Tissue Algorithm Sagittal and Coronal Reconstructions to PACS 5. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)



* Image courtesy of University of Wisconsin

Indications

Without Contrast:	Injury, Fracture
With Contrast	Infection/Cellulitis; If patient cannot have MRI: Tumor/Mass, Proptosis, Grave's Disease
With and Without Contrast:	Rarely indicated - Consult radiologist

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Holdsworth 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Sinus

Anatomical Reference:	Orbitomeatal
Patient Position:	Supine; Tilt the patient's head so that the orbitomeatal line is perpendicular to the CT tabletop (see CT Head protocol).
Patient Orientation:	Head First
Scan Range:	Bottom of maxillary teeth through top of frontal sinuses
Scout:	Lateral
Scan Type:	Helical
Rotation Time:	0.9
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Head
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to patient size
Recon Algorithm:	See comments below
Contrast:	None
Comments:	1. Send 1 mm Bone Algorithm Axial Images to PACS 2. Send 3 mm Soft Tissue Algorithm Axial Images to PACS 3. Send 2 mm Sagittal and Coronal Bone Algorithm Reconstructions to PACS 4. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

Without Contrast:	Sinusitis, Headache
With Contrast:	Rarely indicated - Consult radiologist
With and Without Contrast:	Rarely indicated - Consult radiologist

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Holdsworth 10/2019

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Facial Bones

Anatomical Reference:	Orbitomeatal
Patient Position:	Supine; Tilt the patient's head so that the orbitomeatal line is perpendicular to the CT tabletop (see CT Head protocol).
Patient Orientation:	Head First
Scan Range:	Bottom of mandible through top of frontal sinuses
Scout:	Lateral
Scan Type:	Helical
Rotation Time:	0.9
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Head
kVp:	120
mAs:	Auto mA
Scan Delay:	60 seconds, if contrast used
Respiration:	None
DFOV:	Adjust to patient size
Recon Algorithm:	See comments below
Contrast:	80 mL Omnipaque 300 mg/mL or equivalent water soluble contrast @ 2-3 mL/sec
Comments:	1. Send 1 mm Bone Algorithm Axial Images to PACS 2. Send 3 mm Soft Tissue Algorithm Axial Images to PACS 3. Send 2 mm Sagittal and Coronal Bone Algorithm Reconstructions to PACS 4. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

Without Contrast:	Facial Trauma
With Contrast:	Infection
With and Without Contrast:	Rarely indicated - Consult radiologist

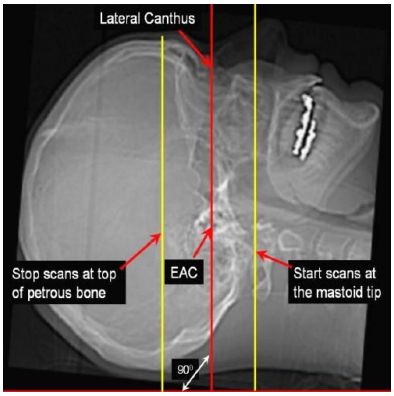
****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Holdsworth 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

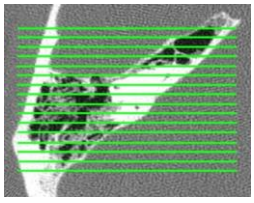
CT Temporal Bones

Anatomical Reference:	Orbitomeatal
Patient Position:	Supine; Tilt the patient's head so that the orbitomeatal line is perpendicular to the CT tabletop (see image).
Patient Orientation:	Head First
Scan Range:	Mastoid tip through top of petrous bone
Scout:	Lateral
Scan Type:	Helical
Rotation Time:	0.9
Thickness:	1.25 mm, Recon as thin as possible
Interval:	.625 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Head
kVp:	120
mAs:	Auto mA
Scan Delay:	60 seconds, if contrast used
Respiration:	None
DFOV:	15cm
Recon Algorithm:	See comments below



Contrast:	80 mL Omnipaque 300 mg/mL or equivalent water soluble contrast @ 2-3 mL/sec
Comments:	1. Send 3 mm Full FOV Soft Tissue Axial Images to PACS 2. Send thin (.625 mm, if possible) Bone Algorithm Axial Reconstructions of the Left Temporal Bone to PACS 3. Send thin (.625 mm, if possible) Bone Algorithm Axial Reconstructions of the Right Temporal Bone to PACS 4. Send thin (.625 mm, if possible) Bone Algorithm Coronal Reconstructions of the Left Temporal Bone to PACS 5. Send thin (.625 mm, if possible) Bone Algorithm Coronal Reconstructions of the Right Temporal Bone to PACS 6. Send thin Bone and Soft Tissue Algorithm slices to 3D workstation (Vitrea Bridge or TeraRecon)

* Image courtesy of University of Wisconsin



Example axial field of view and coronal reconstruction plane

Indications

Without Contrast:	Hearing Loss, Cholesteatoma, Trauma/fracture, Mastoiditis
With Contrast:	Jugular Bulb Anamolies; If patient cannot have MRI: Vestibulitis, Glomus
With and Without Contrast:	Rarely indicated - Consult radiologist

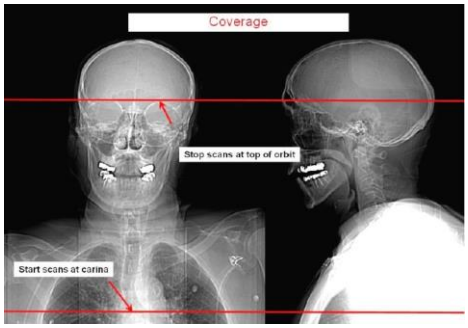
****Values will vary between machines. Use your own discretion when selecting these values.****

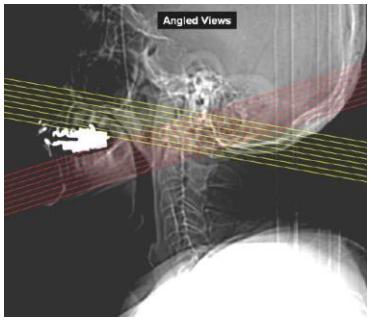
Reviewed by Dr. Holdsworth 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Soft Tissue Neck

Anatomical Reference:	Mid Neck
Patient Position:	Supine
Patient Orientation:	Head First
Scan Range:	Orbits to Carina
Scout:	AP and Lateral
Scan Type:	Helical
Rotation Time:	0.6
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
	**If patient has significant dental hardware, scan additional angled axial views at 2 mm for 16 slices at two different angles - See Picture
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	60 seconds, if contrast used
Respiration:	None
DFOV:	Adjust to patient size (Include nose in field)
Recon Algorithm:	Standard
Contrast:	80 mL Omnipaque 300 mg/mL or equivalent water soluble contrast @ 2-3 mL/sec
Comments:	1. Send 3 mm Soft Tissue Algorithm Axial Images to PACS 2. Send 2 mm Sagittal and Coronal Soft Tissue Algorithm Reconstructions to PACS 3. Send Angled Axial Images to PACS, if performed (Do not do recons on these series) 4. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)





Example of angled axial images, if necessary

* Image courtesy of University of Wisconsin

Indications

With Contrast:	Infection, Mass, Adenopathy
Without Contrast:	ONLY perform if patient unable to have contrast
With and Without Contrast:	Rarely indicated - Consult radiologist

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Holdsworth 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT
C-Spine

Anatomical Reference:	Mid Neck
Patient Position:	Supine
Patient Orientation:	Head First
Scan Range:	C-1 thru C-7
Scout:	Lateral, AP if necessary
Scan Type:	Helical
Rotation Time:	1.0
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Small
kVp:	140
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Cone down to only include spine
Recon Algorithm:	See comments below
Contrast:	80 mL Omnipaque 300 mg/mL or equivalent water soluble contrast @ 2-3 mL/sec
Comments:	1. Send 2 mm Soft Tissue Axial Images to PACS 2. Send 2 mm Bone Algorithm Axial Images to PACS 3. Send 2 mm Bone Algorithm Sagittal and Coronal Reconstructions to PACS 4. Send 2 mm Soft Tissue Algorithm Sagittal Reconstructions to PACS 5. Send Soft Tissue Thin Slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

Without Contrast:	Trauma, Fracture, Pain
With Contrast:	Infection or Tumor AND patient unable to have MRI
With and Without Contrast:	Rarely indicated - Consult radiologist

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Holdsworth 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT
T-Spine

Anatomical Reference:	Sternal Notch
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	T-1 thru T-12
Scout:	Lateral, AP if necessary
Scan Type:	Helical
Rotation Time:	1.0
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Cone down to only include spine
Recon Algorithm:	See comments below
Contrast:	80 mL Omnipaque 300 mg/mL or equivalent water soluble contrast @ 2-3 mL/sec
Comments:	1. Send 2 mm Soft Tissue Axial Images to PACS 2. Send 2 mm Bone Algorithm Axial Images to PACS 3. Send 2 mm Bone Algorithm Sagittal and Coronal Reconstructions to PACS 4. Send 2 mm Soft Tissue Algorithm Sagittal Reconstructions to PACS 5. Send Soft Tissue Thin Slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

Without Contrast:	Trauma, Fracture, Pain
With Contrast:	Infection or Tumor AND patient unable to have MRI
With and Without Contrast:	Rarely indicated - Consult radiologist

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Holdsworth 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT
L-Spine

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	L-1 thru S-1
Scout:	Lateral, AP if necessary
Scan Type:	Helical
Rotation Time:	1.0
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	Inspiration
DFOV:	Cone down to only include spine
Recon Algorithm:	See comments below
Contrast:	80 mL Omnipaque 300 mg/mL or equivalent water soluble contrast @ 2-3 mL/sec
Comments:	1. Send 2 mm Soft Tissue Axial Images to PACS 2. Send 2 mm Bone Algorithm Axial Images to PACS 3. Send 2 mm Bone Algorithm Sagittal and Coronal Reconstructions to PACS 4. Send 2 mm Soft Tissue Algorithm Sagittal Reconstructions to PACS 5. Send Soft Tissue Thin Slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

Without Contrast:	Trauma, Fracture, Pain
With Contrast:	Infection or Tumor AND patient unable to have MRI
With and Without Contrast:	Rarely indicated - Consult radiologist

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Holdsworth 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Chest
Routine

Anatomical Reference:	Sternal Notch
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Apices through Adrenal Glands
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Smart Prep (ROI-Aortic Arch, Scan Threshold-70 HU)
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 100 mL Omnipaque 300 mg/mL or equivalent water soluble contrast injected at 3 mL/sec
Comments:	1. Send 3 mm Soft Tissue Recon Algorithm Axial Images to PACS 2. Send 3 mm Lung Recon Algorithm Axial Images to PACS 3. Send 2 mm Sagittal and Coronal Reconstructions to PACS 4. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

Without Contrast:	Follow-Up Lung Nodule >8mm, Interstitial Lung Disease
With Contrast:	Cough, Smoker, Pneumonia, Emphysema, Follow-Up or Staging Lung Cancer, Follow-Up Long Nodule

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT ION Chest

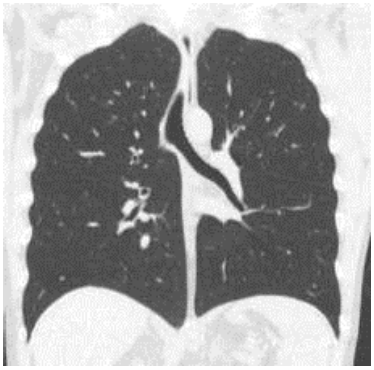
Performed at IMMC Only

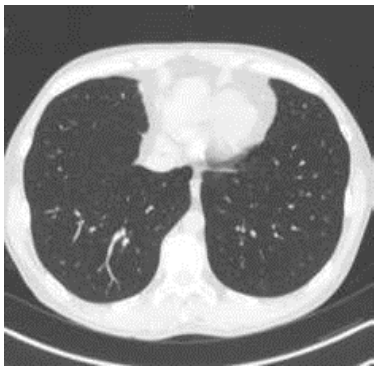
Anatomical Reference:	Sternal Notch
Patient Position:	Supine; Arms above head
Patient Orientation:	Feet First
Scan Range:	2 cm above lung apexes through entire chest 2 cm below costophrenic angles
Scout:	AP, Lateral
Scan Type:	Helical
Rotation Time:	Fastest to reduce motion
Thickness:	.5mm-1.0MM, Recon as thin as possible
Interval:	.5mm-.8mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	110-140
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	None
Respiration:	Tech will give Full inspiration instructions
DFOV:	< 32cm
Recon Algorithm:	Standard
Contrast:	Oral: None

Comments:

1. Send .7 mm FOV <32 Soft Tissue Recon Axial Images to Vitrea, Tera, ION
2. Send 3 mm Full FOV Soft Tissue Recon Algorithm Axial Images to PACS
3. Send 3 mm Full FOV Lung Recon Algorithm Axial Images to PACS
4. Send 2 mm Full FOV Sagittal and Coronal Reconstructions to PACS

Scan Patients in the same position that will be used during the procedure





****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 9/2023

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Chest
High Resolution

Over 18

Anatomical Reference:	Sternal Notch
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Apices through Lung Base
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1 mm
Interval:	1 mm
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	None
Respiration:	Series 1 - Inspiration Series 2 - Expiration
DFOV:	Adjust to patient size
Recon Algorithm:	Series 1 - Bone Plus (Detailed Lung) Series 2 - Bone Plus (Detailed Lung)
Contrast:	Oral: None IV: None
Comments:	History of Cystic Fibrosis - Call Radiologist 1. Series 1 - Inspiration - Scan using High Res technique - Send 1 mm Inspiration High Res Lung Images to PACS. - Send 3 mm Mediastinum Images to PACS. - Send 3 mm Sagittal and Coronal Mediastinum Reconstructions to PACS. - Send Thin Inspiration Lung Windows to 3D Workstation (Vitrea Bridge or TeraRecon) 2. Series 2 - Expiration - Scan using High Res technique - Send 1 mm Expiration High Res Lung Images to PACS.

Indications

Without Contrast:	Interstitial Lung Disease, Bronchiectasis

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Keller 6/2021

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Chest

High Resolution

Under 18

Anatomical Reference:	Sternal Notch
Patient Position:	Prone
Patient Orientation:	Feet First
Scan Range:	Apices through Lung Base
Scout:	AP, Lateral if necessary
Scan Type:	Axial
Rotation Time:	0.8
Thickness:	2 mm, Recon as thin as possible
Interval:	2 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	None
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: None
Comments:	1. Send 2 mm Axial Mediastinum Windows to PACS 2. Send 2 mm Axial High Res Lung Windows to PACS 3. Send 3 mm Sagittal and Coronal Mediastinum Reconstructions to PACS 3. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

Without Contrast:	Interstitial Lung Disease, Bronchiectasis

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Steinberg 4/2019

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Low Dose Lung Screen

Anatomical Reference:	Sternal Notch
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Apices through Lung Base
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.5
Thickness:	1 mm
Interval:	1 mm
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Use low dose technique
Scan Delay:	None
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: None
Comments:	1. Send 3 mm Mediastinum Algorithm Axial Images to PACS 2. Send 1.5 mm Mediastinum Algorithm Axial Images to PACS 3. Send 3 mm Mediastinum Algorithm Sagittal and Coronal Reconstructions to PACS 4. Send thin (recon to 0.6mm) Abdomen Algorithm Images to 3D Workstation (Vitrea Bridge or TeraRecon)
Notes:	****** For patients having a lung screening exam which requires a 3 or 6 month follow up, the follow up exam should be scanned using the low dose protocol but billed as a CT Chest WO Contrast** ****** On follow up exams, be sure to add a comment for the radiologist that the scan is a lung screen F/U so the correct dictation template is used.**

Indications

Without Contrast:	Screening

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Smith 1/2023

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Cardiac Calcium Score

Anatomical Reference:	Top of the Shoulders
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Carina thru Base of Heart
Scout:	AP
Scan Type:	Axial
Thickness:	3 mm
Interval:	3 mm
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	Inspiration
DFOV:	Varied
Recon Algorithm:	Mediastinum
Contrast:	None
Comments:	1. Send Mediastinum windows to PACS 2. Send Mediastinum windows to 3D Workstation (TeraRecon) 3. Use 4 lead EKG for gating 4. Female patients must remove bra prior to scan

Indications

Without Contrast:	Screening, Elevated Cholesterol, Hypertension, Diabetes, Atypical Chest Pain

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Walker 6/2017

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Esophagram

Esophageal Leak Study

Anatomical Reference:	Mid neck
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Mid Neck (C4/C5) thru Stomach (L2/L3)
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	None
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: Dilute 15 mL Omnipaque 350 or equivalent water soluble contrast in 10 oz bottled or sterile water IV: None
Comments:	**Patient needs to be NPO for 2 hours prior to exam 1. Series 1 - Non contrast 2. Series 2 - Oral Contrast - The patient drinks all of the contrast - Scan immediately **The shorter the time period between swallowing oral contrast and imaging acquisition, the better the diagnostic value** 1. Send 3 mm Axial Images to PACS 2. Send 2 mm Sagittal and Coronal Reconstructions to PACS 3. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

Without Contrast: Esophageal leak or rupture

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Becker 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Trauma
Chest/Abd/Pelvis

Anatomical Reference:	Sternal Notch
Patient Position:	Supine
Patient Orientation:	Head First
Scan Range:	Apices through Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	60 seconds
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 100 mL Omnipaque 300 mg/mL or equivalent water soluble contrast injected at 2-3 mL/sec, preferred
Comments:	1. Send 3 mm Soft Tissue Recon Algorithm Axial Images to PACS 2. Send 3 mm Lung Recon Algorithm Axial Images of entire Chest/Adomen/Pelvis to PACS 3. Send 2 mm Soft Tissue Sagittal and Coronal Reconstructions to PACS 4. Send 2 mm Bone Recon Algorithm Sagittal and Coronal Reconstructions to PACS 5. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon) 6. Delay images only if requested by ER or trauma physician

Indications

With Contrast:	Trauma

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT
Abd/Pelvis
Routine

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm through Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	60 seconds
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard

Contrast:

Oral: **See notes below** - 1000 mL diluted contrast 1-2 hours prior to CT OR 1000 mL Ready to Drink (RTD) Omnipaque Oral Solution 1-2 hours prior to CT

IV: 100 mL Omnipaque 300 mg/mL or equivalent water soluble contrast injected at 2-3 mL/sec

Comments:

1. Send 3 mm Axial Images to PACS
2. Send 2 mm Sagittal and Coronal Reconstructions to PACS
3. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)
4. Renal/bladder delays not routinely indicated. Contact the on site radiologist if there are questions.

Oral Contrast Notes:

1. Oral contrast not needed for most exams.
2. Give oral contrast for:
    a. Any history of pelvic radiation therapy
    b. PARTIAL small bowel obstruction (SBO) (Complete or High grade SBO = NO oral contrast)
    c. Recently treated SBO (e.g. floor patients with an NG tube for a couple days)

Continued on next page

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Abdomen/Pelvis - Routine Cont.

Oral Contrast Notes:

d. Abscess
e. Symptoms of appendicitis for 3 days or more
f. Low BMI (24 or less)
g. Postop from any major bowel surgery including bariatrics
h. Any Gynecologic Oncology patient of Dr. Elg
i. Ovarian pathology / Tubo-ovarian abscess
j. GI fistula
k. Duplication cyst
l. Follow up of gastrointestinal or mesenteric trauma
m. Crohn's Disease

Indications

With Contrast: Routine, Follow-Up, Pain

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT
Abd/Pelvis
Adult ER Belly Pain

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm through Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	60 seconds
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard

Contrast:

Oral: **See notes below** - 1000 mL diluted contrast 1-2 hours prior to CT OR 1000 mL Ready to Drink (RTD) Omnipaque Oral Solution 1-2 hours prior to CT

IV: 100 mL Omnipaque 300 mg/mL or equivalent water soluble contrast injected at 2-3 mL/sec

Comments:

1. Send 3 mm Axial Images to PACS
2. Send 2 mm Sagittal and Coronal Reconstructions to PACS
3. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)
4. Renal/bladder delays not routinely indicated. Contact the on site radiologist if there are questions.

Oral Contrast Notes:

1. **Give oral contrast for:**
   a. Recent (≤ 2 months) hx of abdominal surgery
   b. BMI ≤ 24
   c. Any hx of inflammatory bowel disease (i.e. Crohns or ulcerative
   d. Any hx major complex oncologic abdominal/pelvic cancer surgery (i.e. gyn-onc, whipple surgery)
   e. Lower abdominal pain > 3 days with concern for abscess
   f. Concern for partial SBO (no vomiting, passing gas/stool) should receive oral contrast, regardless of BMI

Continued on next page

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Abdomen/Pelvis - ER Cont.

Oral Contrast Notes:

g. Crohns disease

2. **Plain film first:**
   a. Surgical abdomen (i.e. rigid abd, generalized peritonitis, concern for perforation/free air)
   b. High grade SBO (i.e. vomiting, obstipation, distension, hx prior abdominal surgeries)

Pending results of Plain Film - Should consult surgery prior to ordering CT

3. **Without oral contrast for:**
   a. Uncomplicated appendicitis, uncomplicated diverticulitis, uncomplicated colitis or pyelonephritis
   b. Recent trauma

Indications

With Contrast: Adult patients presenting to ER with belly pain

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT
Abd/Pelvis
Appy Protocol

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm through Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	60 seconds
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard

Contrast:

Oral: None, except for symptoms of appendicitis for 3 days or more, then give: 1000 mL diluted contrast 1-2 hours prior to CT OR 1000 mL Ready to Drink (RTD) Omnipaque Oral Solution 1-2 hours prior to CT

IV: 100 mL Omnipaque 300 mg/mL or equivalent water soluble contrast injected at 2-3 mL/sec

Comments:

1. No preliminary non-contrast scans necessary.
2. For all abdominal CT's in which there is a concern for or history of recent abscess, oral contrast is needed in addition to IV.
3. Send 3 mm Axial Images to PACS
4. Send 2 mm Sagittal and Coronal Reconstructions to PACS
5. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)
6. Renal/bladder delays not routinely indicated. Contact the on site radiologist if there are questions.
7. For symptoms of appendicitis for 3 days or more, give oral and IV contrast.

Indications

With Contrast: RLQ Pain, Elevated WBC, Fever

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT
Abd/Pelvis
Renal Stone Protocol

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm through Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	None
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: None
Comments:	1. Send 3 mm Axial Images to PACS 2. Send 2 mm Sagittal and Coronal Reconstructions to PACS 3. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon) 4. Check scans with radiologist before patient leaves to make sure contrast is not necessary.

Indications

Without Contrast:	Hematuria, Flank Pain, Hx Stones

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2019 / Dr. Keller 1/2019

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Abd/Pelvis Venogram

*** Call radiologist before the exam. Radiologist needs to review 100 second acquisition immediately.***

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm through Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Series 1 - 100 seconds; Series 2 - 4 minutes
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 150 mL Omnipaque 300 mg/mL or Omnipaque 350 mg/mL or equivalent water soluble contrast injected at 2-3 mL/sec
Comments:	1. Series 1 - 100 second delay - Dome of diaphragm through pubic symphysis ***Radiologist Review*** 2. Series 2 - 4 minute delays - Dome of diaphragm through pubic symphysis 3. Send 3 mm Axial Images to PACS 4. Send 2 mm Sagittal and Coronal Reconstructions to PACS 5. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With Contrast:	Blood Clot in IVC

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Liver
3 Phase

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Iliac Crest
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Arterial - 30-35 sec; Venous - 70sec; Series 4 - 5 min
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 120 mL Omnipaque 300 mg/mL or equivalent water soluble contrast injected at 5 mL/sec
Comments:	1. Series 1 - Without Contrast 2. Series 2 - Arterial Phase 3. Series 3 - Venous Phase 4. Series 4 - 5 minute delay 5. OPTIONAL - If performed specifically for hemangioma, add: Series 5 - 10 minute delay 6. Send 3 mm Axial Images (Series 1-4) to PACS 7. Send 2 mm Sagittal and Coronal Reconstructions (Series 1-3) to PACS 8. Send thin images (Series 1-4) to 3D Workstation (Vitrea Bridge or TeraRecon) 9. A proper hepatic arterial phase is when the hepatic artery is heavily contrasted and there is a trace amount of contrast in the portal vein.

Indications

With & Without Contrast:	Known Liver Mass/Hepatoma, S/P Radiofrequency Ablation (RFA), S/P Chemotherapy, Embolization, Follow Up Known Hemangioma

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Adrenals

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Iliac Crest
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Venous - 70 sec, Series 3 - 15 minutes
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 130 mL Omnipaque 300 mg/mL or equivalent water soluble contrast injected at 2 mL/sec
Comments:	1. Series 1 - Without Contrast to Localize Adrenals 2. Series 2 - Venous Phase - Dome of Diaphragm to the Iliac Crest, **or through Pubic Symphysis if Pelvis ordered** 3. Series 3 - 15 minute delay from Dome of Diaphragm to Iliac Crest, **or from Dome of Diaphragm through Pubic Symphysis if Pelvis ordered** 4. Send 3 mm Axial Images (Series 1-3) to PACS 5. Send 2 mm Sagittal and Coronal Reconstructions (Series 1 & 2) to PACS 6. Send thin images (Series 1-3) to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With & Without Contrast:	Adrenal Mass, Adrenal F/U, Pheochromocytoma

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Pancreas

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Iliac Crest
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Arterial - 25 sec, Venous - 60 sec, Series 4 - 5 min
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard

Contrast:

Oral: 200 mL diluted contrast 15-20 minutes prior to scanning
EXCEPTION, if recent post-op, following recent abscess in upper abdomen or gastric outlet, or duodenal obstruction, then give:
1000 mL diluted contrast 1-2 hour prior to CT plus 200 mL diluted contrast just prior to scanning OR
1000 mL Ready to Drink (RTD) Omnipaque Oral Solution 1-2 hours prior to CT plus 200 mL diluted contrast just prior to scanning

IV: 120 mL Omnipaque 300 mg/mL or equivalent water soluble contrast injected at 4 mL/sec

Comments:

All series must include entire pancreas - Scan from top of liver through bottom of duodenal sweep or iliac crest, whichever is lower.

1. Series 1 - Without Contrast
2. Series 2 - Arterial Phase
3. Series 3 - Venous Phase
4. Series 4 - 5 minute delay
5. Send 3 mm Axial Images (Series 1-4) to PACS
6. Send 2 mm Sagittal and Coronal Reconstructions (Series 1-3) to PACS
7. Send thin images (Series 1-4) to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With & Without Contrast: Epigastric Pain, Elevated Amylase-Lipase, Pancreatitis

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Kidneys /Mass

If ordered as CT Abdomen & Pelvis, see notes below.

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Iliac Crest
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Arterial - 30 sec; Nephrographic - 60 sec; Delays - 10 mins
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 120 mL Omnipaque 300 mg/mL or equivalent water soluble contrast injected at 4 mL/sec
Comments:	1. Series 1 - Without Contrast - Dome of Diaphragm to the Iliac Crest 2. Series 2 - Arterial Phase - Dome of Diaphragm to the Iliac Crest 3. Series 3 - Nephrographic Phase - Dome of Diaphragm to the Iliac Crest 4. Series 4 - Delayed Kidneys - 10 minute delay 5. Send 3 mm Axial Images (Series 1-4) to PACS 6. Send 2 mm Sagittal and Coronal Reconstructions (Series 1-4) to PACS 7. Send thin images (Series 1-4) to 3D Workstation (Vitrea Bridge or TeraRecon) *8. When a pelvis is also ordered, contact Dr. King or the on site radiologist for pelvis protocol. Default protocol for pelvis portion is a single run in the portal venous phase.*

Indications

With & Without Contrast:	F/U suspected mass on other study, Known renal mass, Follow up abscess, renal trauma, infarction, laceration, etc.

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Urogram

Split Bolus Protocol

***If a CT Urogram is ordered for renal mass, scan according to CT Kidney/Mass protocol (to include pelvis)**

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Thickness:	Variable, See comments
Interval:	Variable, See comments
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	See below
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard

Contrast:

Oral: 200 mL water on the CT scan table

IV: 50 mL Omnipaque 300 or Isovue 300 mg/mL + 50 mL Saline flush injected at 1.5 mL/sec **Wait 10 minutes** 100 mL Omnipaque 300 or Isovue 300 mg/mL + 50 mL Saline flush injected at 3 mL/sec

Comments:

1. Patient needs to arrive with a full bladder. Have patient void before bringing to the scanner.
2. Series 1 - Without Contrast - Dome of Diaphragm to Pubic Symphysis (3 mm slice thickness) - Call radiologist if obvious ureter stone, otherwise proceed.
3. INJECTION - Inject 50 mL of contrast + 50 mL saline flush @ 1.5 mL/second. Wait 10 minutes, THEN proceed with the next series.
4. Series 2 - Parenchymal Phase - Inject 100 mL of contrast + 50 mL saline flush @ 3mL/second. Start the scan after a 115 second delay (build delay into scan protocol if possible) - Scan Dome of Diaphragm to Pubic Symphysis
5. Send Axial Images (Series 1 & 2) to PACS
6. Send 2 mm Sagittal & Coronal Reconstructions (Series 1 & 2) to PACS
7. Send thin slices (all series) to 3D Workstation (Vitrea Bridge or TeraRecon)
8. Correct Order: CT Abdomen / Pelvis W/WO contrast

Indications

With & Without Contrast: Nonspecific hematuria, Ureter injury

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Drs. King & Thornton 3/2021

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Cystogram

Anatomical Reference:	Iliac Crest
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Iliac Crest through Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	None
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard

Contrast:

Oral: None

Retrograde: 30 mL Omnipaque 300 mg/mL or equivalent water soluble contrast diluted in 500 mL Saline
Using sterile technique, connect the tubing to the patient's foley catheter and allow the bladder to fill retrograde. If the patient is oriented, have the pt tell you when they are getting uncomfortably full. If they are unable to tell you, run in about 300 mL.

Comments:

1. Series 1 - Without Contrast
2. Series 2 - Fill bladder and scan
3. Have onsite radiologist check images to determine if additional imaging is needed.
4. Send 3 mm Axial Images (All series) to PACS
5. Send 2 mm Sagittal and Coronal Reconstructions (All series) to PACS
**If performed for trauma, include soft tissue and bone algorithm recons on without series. If not for trauma, only include soft tissue algorithm recons on w/o series.*
6. Send thin images (All series) to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With & Without Contrast:	Trauma, Post Op Bladder/Pelvic Surgery

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Enterography

Routine

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	100
mAs:	Auto mA
Scan Delay:	50-60 seconds
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard

Contrast:

Oral: 1350 mL's Volumen @ 60, 45 and 30 minutes prior to scanning. Full cup of water immediately before scanning.

IV: 120 mL Omnipaque 300 mg/mL or equivalent water soluble contrast injected at 4 mL/sec

Comments:

1. Radiologist to approve prior to scheduling (if ordered for Crohn's, then proceed)
2. KUB before patient starts drinking contrast.
3. Send 3 mm Axial Images to PACS
4. Send 2 mm Sagittal and Coronal Reconstructions to PACS
5. Send thin images to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With Contrast: Crohn's Disease, Stricture, Nonspecific GI Indications, specifically small bowel

GI BLEED WORKUP - USE MULTIPHASE PROTOCOL

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Enterography

Multiphase

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	100
mAs:	Auto mA
Scan Delay:	Arterial: As Below; Enteric: 20-25 secs; Delayed: 70-75 secs
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard

Contrast:

Oral: 1350 mL's Volumen @ 60, 45 and 30 minutes prior to scanning. Full cup of water immediately before scanning.

IV: 120 mL Omnipaque 300 mg/mL or equivalent water soluble contrast injected at 4 mL/sec

Comments:

1. Radiologist to approve prior to scheduling (if ordered for occult GI bleeding, then proceed).
2. KUB before patient starts drinking contrast.
3. Series 1 - Without contrast
4. Series 2 - Arterial Phase - Bolus triggered w/ ROI on mid aorta. Trigger with 200 HU.
5. Series 3 - Enteric Phase - 20-25 secs after arterial phase
6. Series 4 - Delayed Phase - 70-75 secs after arterial phase
7. Send 3 mm Axial Images (Series 1-4) to PACS
8. Send 2 mm Sagittal and Coronal Reconstructions (Series 1-4) to PACS
9. Send thin images (Series 1-4) to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With Contrast: Occult GI Bleed Workup; For Acute GI Bleed-See CTA Protocol

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Virtual Colonoscopy

Anatomical Reference:	Xyphoid
Patient Position:	Series 1 - Supine Series 2 - Prone
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Pubic Symphysis
Scout:	AP, PA, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm
Interval:	1.25 mm
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Distend colon with CO2
Comments:	1. Make sure patient has done the bowel prep. 2. Do not scan until colon is completely distended. 3. Series 1 - Patient is supine. 4. Series 2 - Patient is prone. 5. Send 2 mm Sagittal and Coronal Reconstructions (on Series 1 OR 2, whichever has best coverage) to PACS 6. Send all images to McKesson PACS.

Indications

Without Contrast:	Screening

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Keller 2/2018 / Dr. King 2/2018

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Pelvis

Anatomical Reference:	Iliac Crest
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Iliac Crest thru Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	75 seconds
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard

Contrast:

Oral: **See notes below** - 1000 mL diluted contrast 1-2 hours prior to CT OR 1000 mL Ready to Drink (RTD) Omnipaque Oral Solution 1-2 hours prior to CT

IV: 100 mL Omnipaque 300 mg/mL or equivalent water soluble contrast injected at 2-3 mL/sec

Comments:

1. No preliminary non-contrast scans necessary.
2. Send 3 mm Axial Images to PACS
3. Send 2 mm Sagittal and Coronal Reconstructions to PACS
4. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)
5. Do delayed bladder on all patients with:
    a. Pelvic abcess
    b. Recent pelvic surgery
    c. Any bladder, prostate or gynecologic surgery

Oral Contrast Notes:

1. Oral contrast not needed for most exams.
2. Give oral contrast for:
    a. Any history of pelvic radiation therapy
    b. PARTIAL small bowel obstruction (SBO) (Complete or High grade SBO = NO oral contrast)

Continued on next page

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Pelvis Cont.

Oral Contrast Notes:

c. Recently treated SBO (e.g. floor patients with an NG tube for a couple days)
d. Abscess
e. Symptoms of appendicitis for 3 days or more
f. Low BMI (24 or less)
g. Postop from any major bowel surgery including bariatrics
h. Any Gynecologic Oncology patient of Dr. Elg
i. Ovarian pathology / Tubo-ovarian abscess
j. GI fistula
k. Duplication cyst
l. Follow up of gastrointestinal or mesenteric trauma

Indications

Without Contrast: Pain, Follow Up

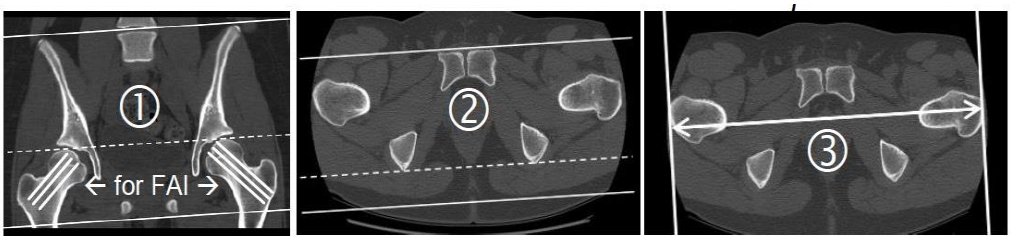
****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT
Bony Pelvis

Anatomical Reference:	Iliac Crest
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	2 cm above Iliac Crest thru Proximal Femoral Shaft
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	None
Comments:	1. Send 3 mm Soft Tissue Axial Images to PACS 2. Send 3 mm Bone Window Axial Images to PACS 3. Send 3 mm thick / 3 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS 4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)



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Indications

Without Contrast:	Pain, Injury, Fracture

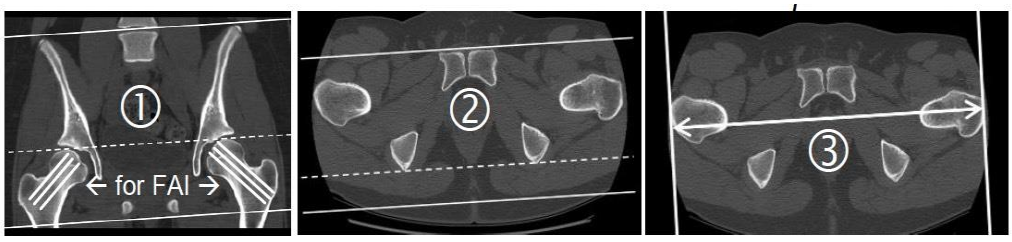
****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 1/2019

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT
Hip/Pelvis

Anatomical Reference:	Iliac Crest
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	2 cm above Iliac Crest thru Proximal Femoral Shaft
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	None
Comments:	1. Send 3 mm Soft Tissue Axial Images (Pelvis & Affected Hip) to PACS 2. Send 3 mm Bone Window Axial Images (Pelvis & Affected Hip) to PACS 3. Send 3 mm thick / 3 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS 4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)



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Indications

Without Contrast:	Pain, Injury, Fracture

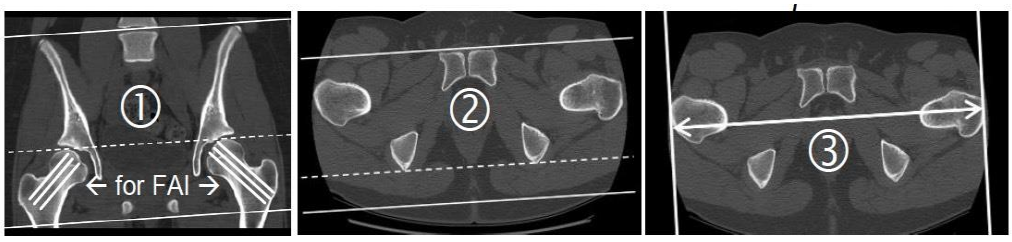
****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 1/2019

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Hip Arthrogram

Anatomical Reference:	Iliac Crest
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Mid Iliac Crest to Subtrochanter (See picture)
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Small
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	None
Comments:	1. Send 3 mm Soft Tissue Axial Images (Pelvis & Affected Hip) to PACS 2. Send 3 mm Bone Window Axial Images (Pelvis & Affected Hip) to PACS 3. Send 3 mm thick / 3 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS 4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)



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Indications

With Contrast:	Pain, Injury, Fracture

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 6/2021

Subject to change at the discretion of the radiologist due to clinical circumstances.

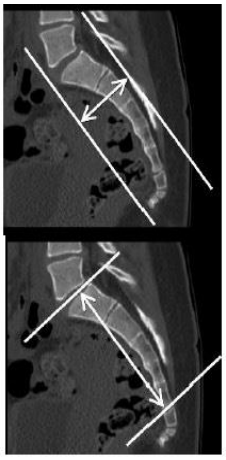
CT SI Joint / Tailbone

Anatomical Reference:	Iliac Crest
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	2 cm above Iliac Crest thru Coccyx
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	None

Comments:

1. Send 3 mm Soft Tissue Axial Images to PACS
2. Send 3 mm Bone Window Axial Images to PACS
3. Send 3 mm thick / 3 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS
4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)

**SI Joint Reconstruction:
Align reconstruction plan from the mid sagittal sacral image
Oblique Coronal: Angle plane parallel to the long axis of the sacrum
Oblique Axial: Angle plane parallel to the OBLIQUE CORONAL reconstucted image



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Indications

Without Contrast:	Pain, Injury, Fracture

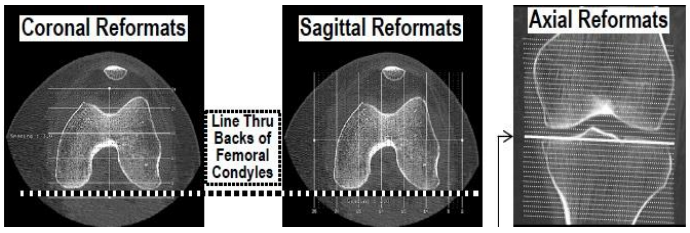
****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 1/2019

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Knee

Anatomical Reference:	Mid Knee
Patient Position:	Supine; TAPE FEET TOGETHER
Patient Orientation:	Feet First
Scan Range:	Entire Knee
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to Knee
Recon Algorithm:	Standard
Contrast:	None
Comments:	1. Send 3 mm Soft Tissue Axial Images to PACS 2. Send 3 mm Bone Window Axial Images to PACS 3. Send 3 mm thick / 3 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS 4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)



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Indications

Without Contrast:	Pain, Injury, Fracture

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 4/2016

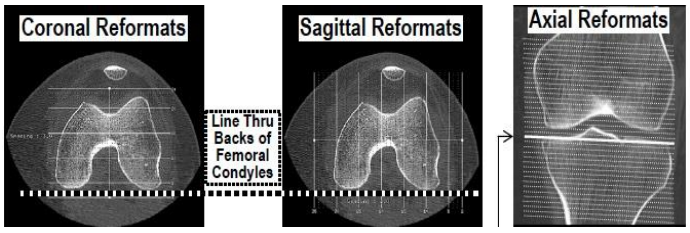
Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Knee Arthrogram

Anatomical Reference:	Mid Knee
Patient Position:	Supine; TAPE FEET TOGETHER
Patient Orientation:	Feet First
Scan Range:	Entire Knee (See picture)
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to Knee
Recon Algorithm:	Standard
Contrast:	None

Comments:

1. Send 3 mm Soft Tissue Axial Images to PACS
2. Send 3 mm Bone Window Axial Images to PACS
3. Send 3 mm thick / 3 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS
4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)



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Indications

With Contrast:	Pain, Injury, Fracture

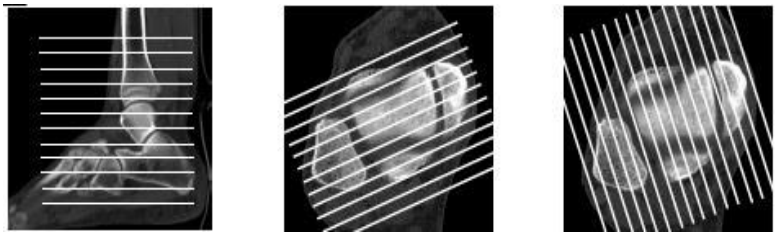
****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 6/2021

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Ankle

Anatomical Reference:	Mid Ankle
Patient Position:	Supine; TAPE FEET TOGETHER (if possible)
Patient Orientation:	Feet First
Scan Range:	Entire Ankle
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Small
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to Ankle
Recon Algorithm:	Standard
Contrast:	None
Comments:	1. Send 3 mm Soft Tissue Window Axial Images to PACS 2. Send 3 mm Bone Window Axial Images to PACS 3. Send 3 mm thick / 3 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS 4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)



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Indications

Without Contrast:	Pain, Injury, Fracture

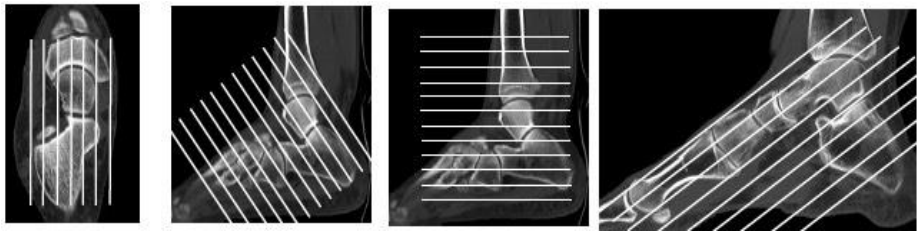
****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 4/2016

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT
Subtalar

Anatomical Reference:	Mid Foot
Patient Position:	Supine; TAPE FEET TOGETHER (if possible)
Patient Orientation:	Feet First
Scan Range:	Entire Ankle
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Small
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to Foot
Recon Algorithm:	Standard
Contrast:	None
Comments:	1. Send 3 mm Soft Tissue Axial Images to PACS 2. Send 3 mm Bone Window Axial Images to PACS 3. Send 2 mm thick / 2 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS 4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)



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Indications

Without Contrast:	Pain, Injury, Fracture

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 4/2016

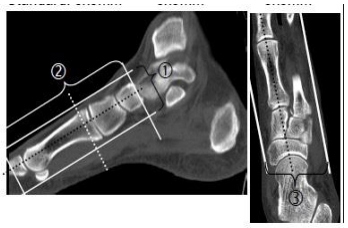
Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Lisfranc

Anatomical Reference:	Mid Ankle
Patient Position:	Supine; TAPE FEET TOGETHER (if possible)
Patient Orientation:	Feet First
Scan Range:	Entire Ankle
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Small
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to Foot
Recon Algorithm:	Standard
Contrast:	None

Comments:

1. Send 3 mm Soft Tissue Axial Images to PACS
2. Send 3 mm Bone Window Axial Images to PACS
3. Send 2 mm thick / 2 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS
4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)



**Align reconstruction on the 1st TMT Joint.

* Images used with permission: Ken L. Schreibman PhD/MD (schreibman@alum.mit.edu)

Indications

Without Contrast: Pain, Injury, Fracture

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 4/2016

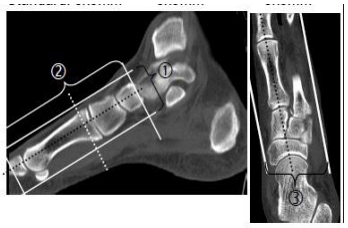
Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Foot

Anatomical Reference:	Mid Foot
Patient Position:	Supine; TAPE FEET TOGETHER (if possible)
Patient Orientation:	Feet First
Scan Range:	Entire Foot
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Small
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to Foot
Recon Algorithm:	Standard
Contrast:	None

Comments:

1. Send 3 mm Soft Tissue Axial Images to PACS
2. Send 3 mm Bone Window Axial Images to PACS
3. Send 2 mm thick / 2 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS
4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)



**Align reconstruction on the metatarsals (MTP joint).

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Indications

Without Contrast:	Pain, Injury, Fracture

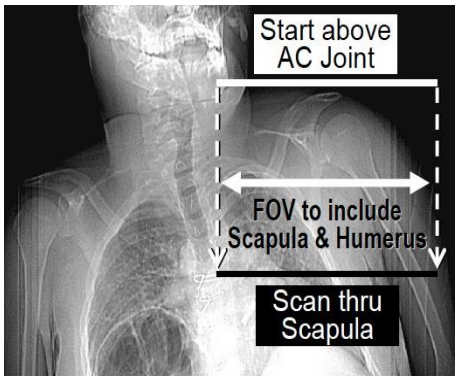
****Values will vary between machines. Use your own discretion when selecting these values.****

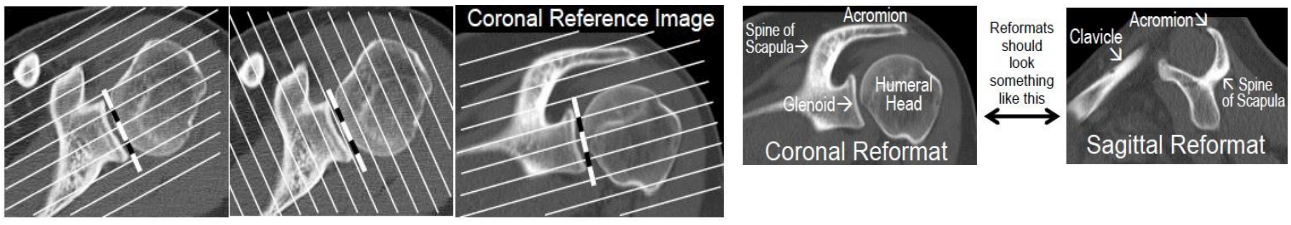
Reviewed by Dr. Choi 4/2016

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Shoulder

Anatomical Reference:	Sternal Notch
Patient Position:	Supine (off center pt so affected shoulder is completely on table)
Patient Orientation:	Head First
Scan Range:	Entire Shoulder
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	Inspiration
DFOV:	Adjust to Shoulder
Recon Algorithm:	Standard
Contrast:	None
Comments:	1. Send 3 mm Soft Tissue Axial Images to PACS 2. Send 3 mm Bone Window Axial Images to PACS 3. Send 3 mm thick / 3 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS 4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)





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Indications

Without Contrast:	Pain, Injury, F/U Fracture, Post Arthrogram

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 4/2016

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Shoulder Arthrogram

Anatomical Reference:	Sternal Notch
Patient Position:	Supine (off center pt so affected shoulder is completely on table)
Patient Orientation:	Head First
Scan Range:	Proximal 1/3 Shaft (See picture)
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	Inspiration
DFOV:	Adjust to Shoulder
Recon Algorithm:	Standard
Contrast:	None

Comments:

1. Series 1 - Scan as a Routine CT Shoulder
2. Series 2 - ABER (Abduction External Rotation), if tolerated - Affected arm up with the patient's hand resting behind their head - Scan through shoulder
3. Send 3 mm Soft Tissue Axial Images (Series 1-2) to PACS
4. Send 3 mm Bone Window Axial Images (Series 1-2) to PACS
5. Send 3 mm thick / 3 mm interval Bone Window Sagittal and Coronal Reconstructions (Series 1-2) to PACS
4. Send Soft Tissue Thin (0.6 mm) Slices (Series 1-2) to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With Contrast:	Pain, Injury, F/U Fracture, Post Arthrogram

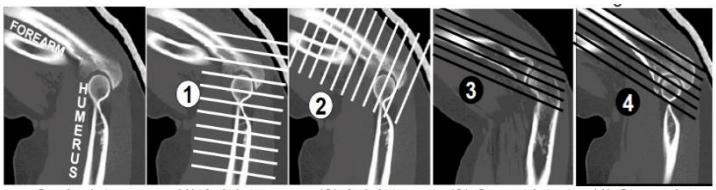
****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 6/2021

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Elbow

Anatomical Reference:	Mid Elbow
Patient Position:	Supine; Arm extended above head
Patient Orientation:	Head First
Scan Range:	Entire Elbow
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Small
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to Elbow
Recon Algorithm:	Standard
Contrast:	None
Comments:	1. Send 3 mm Soft Tissue Axial Images to PACS 2. Send 3 mm Bone Window Axial Images to PACS 3. Send 3 mm thick / 3 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS 4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)



* Images used with permission: Ken L. Schreibman PhD/MD (schreibman@alum.mit.edu)

Indications

Without Contrast:	Pain, Injury, Fracture

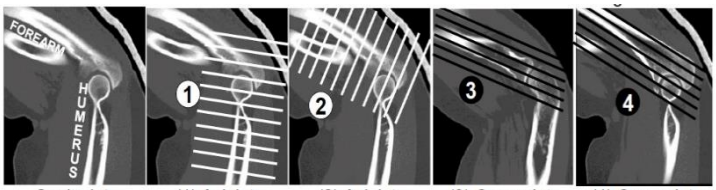
****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 4/2016

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Elbow Arthrogram

Anatomical Reference:	Mid Elbow
Patient Position:	Supine; Arm extended above head
Patient Orientation:	Head First
Scan Range:	Entire Elbow
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Small
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to Elbow
Recon Algorithm:	Standard
Contrast:	None
Comments:	1. Send 3 mm Soft Tissue Axial Images to PACS 2. Send 3 mm Bone Window Axial Images to PACS 3. Send 3 mm thick / 3 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS 4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)



* Images used with permission: Ken L. Schreibman PhD/MD (schreibman@alum.mit.edu)

Indications

With Contrast:	Pain, Injury, Fracture

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 6/2017

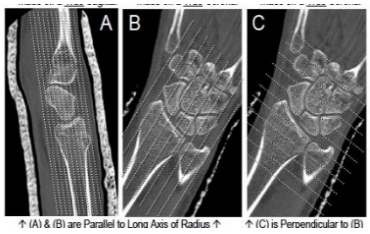
Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Wrist

Anatomical Reference:	Mid Wrist
Patient Position:	Prone, Arm Extended
Patient Orientation:	Head First
Scan Range:	Entire Wrist
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Small
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to Wrist
Recon Algorithm:	Standard
Contrast:	None

Comments:

1. Send 2 mm Soft Tissue Axial Images to PACS
2. Send 2 mm Bone Window Axial Images to PACS
3. Send 2 mm thick / 2 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS
4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)



* Images used with permission: Ken L. Schreibman PhD/MD (schreibman@alum.mit.edu)

Indications

Without Contrast: Pain, Injury, Fracture

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 4/2016

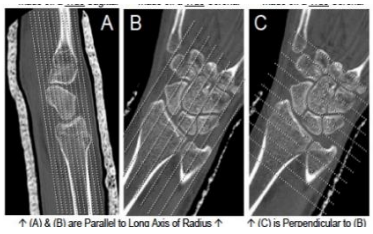
Subject to change at the discretion of the radiologist due to clinical circumstances.

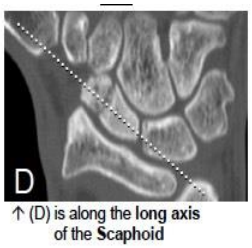
CT Scaphoid / Wrist

Anatomical Reference:	Mid Wrist
Patient Position:	Prone, Arm Extended
Patient Orientation:	Head First
Scan Range:	Entire Wrist
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Small
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to Wrist
Recon Algorithm:	Standard
Contrast:	None

Comments:

1. Send 2 mm Soft Tissue Axial Images to PACS
2. Send 2 mm Bone Window Axial Images to PACS
3. Send 2 mm thick / 2 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS
4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)





* Images used with permission: Ken L. Schreibman PhD/MD (schreibman@alum.mit.edu)

Indications

Without Contrast:	Pain, Injury, Fracture

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 4/2016

Subject to change at the discretion of the radiologist due to clinical circumstances.

CT Hand

Anatomical Reference:	Mid Hand
Patient Position:	Prone, Arm Extended
Patient Orientation:	Head First
Scan Range:	Entire Hand
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.8
Thickness:	1.25 mm, Recon as thin as possible
Interval:	0.6 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Small
kVp:	120
mAs:	Auto mA
Scan Delay:	None
Respiration:	None
DFOV:	Adjust to Hand
Recon Algorithm:	Standard
Contrast:	None

Comments:

1. Send 2 mm Soft Tissue Axial Images to PACS
2. Send 2 mm Bone Window Axial Images to PACS
3. Send 2 mm thick / 2 mm interval Bone Window Sagittal and Coronal Reconstructions to PACS
4. Send Soft Tissue Thin (0.6 mm) Slices to 3D Workstation (Vitrea Bridge or TeraRecon)

* Images used with permission: Ken L. Schreibman PhD/MD (schreibman@alum.mit.edu)

Indications

Without Contrast: Pain, Injury, Fracture

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Choi 4/2016

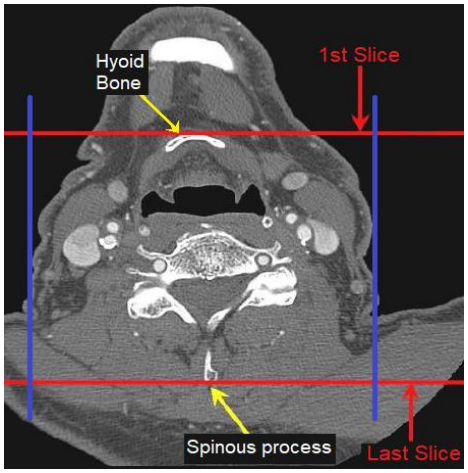
Subject to change at the discretion of the radiologist due to clinical circumstances.

CTA Head & Neck

Anatomical Reference:	Mid Neck
Patient Position:	Supine
Patient Orientation:	Head First
Scan Range:	Inferior Border of Aortic Arch through Vertex
Scout:	AP and Lateral
Scan Type:	Helical
Rotation Time:	0.6
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA
Scan Delay:	Smart Prep (ROI-Aorta)
Respiration:	None
DFOV:	Adjust to include all of head
Recon Algorithm:	Standard
Contrast:	80 mL Omnipaque 350 mg/mL or equivalent water soluble contrast @ 3 mL/sec
Comments:	1. Send thin Soft Tissue Axial images to PACS 2. Send Axial, Coronal and Sagittal Head MIP reformats to PACS, see below 3. Send Coronal and Sagittal Neck MIP reformats to PACS, see below 4. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon) **5. If only a CTA Head or CTA Neck is ordered, contact a radiologist**

MIPs: Head - 10 mm slice thickness; 2.5 mm slice overlap; Window width = 600; Window level = 200
Neck - 10 mm slice thickenss; 5 mm slice overlap; Window width = 600; Window level = 200

* Image courtesy of University of Wisconsin



Indications

With Contrast: Headache, Vertigo, Syncope, Aneurysm, Stenosis, Stroke, TIA

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Holdsworth 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CTA Chest

PE Protocol

Anatomical Reference:	Sternal Notch
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Apices through Lung Bases
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Rotation Time:	0.5
Thickness:	3mm, Recon as thin as possible
Interval:	3mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	100, adjust accordingly for very large patients
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Smart Prep (ROI-Pulmonary Artery, Scan Threshold-120 HU)
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 100 mL Omnipaque 350 or Isovue 370 mg/mL injected at 5 mL/sec *May need to adjust scan parameters to use all 100 mL IV contrast
Comments:	1. Start IV in right arm, if possible. 2. Send 3 mm Axial Images to PACS 3. Send 2 mm Sagittal and Coronal Reconstructions to PACS 4. Send 3D Reformatted Images to PACS 5. Send thin slices to PACS 6. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With Contrast:	Evaluate for Pulmonary Emboli, Positive DVT, Acute SOB

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Wolford 4/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CTA Chest

Anatomical Reference:	Sternal Notch
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Aortic Arch through Diaphragm
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Smart Prep (ROI-descending aorta just below aortic arch)
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 130 mL Omnipaque 350 or Isovue 370 mg/mL injected at 5 mL/sec
Comments:	1. Series 1 - Without Contrast 2. Series 2 - Arterial Phase 3. If scanning for aneurysm or dissection, need to scan through iliacs. 4. Send 3 mm Axial Images to PACS 5. Send 2 mm Sagittal and Coronal Reconstructions to PACS 6. Send 3D Reformatted Images to PACS 7. Send thin slices to PACS 8. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon) **Use gating for CTA Chest, if available.**

Indications

With & Without Contrast:	Aneurysm, Dissection, Coarctation

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Keller 6/2021

Subject to change at the discretion of the radiologist due to clinical circumstances.

CTA
Chest/Abd/Pelvis

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Thoracic Inlet to Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Smart Prep (ROI-Descending Aorta just below Arch)
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 130 mL Omnipaque 350 or Isovue 370 mg/mL injected at 5 mL/sec
Comments:	1. Series 1 - Without Contrast 2. Series 2 - Arterial Phase 3. Send 3 mm Axial Images to PACS 4. Send 2 mm Sagittal and Coronal Reconstructions to PACS 5. Send 3D Reformatted Images to PACS 6. Send thin slices to PACS 7. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon) **Use gating for CTA Chest, if available and scanner allows for diagnostic imaging.**

Indications

With & Without Contrast:	Dissection

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 10/2023

Subject to change at the discretion of the radiologist due to clinical circumstances.

CTA
Abd/Pelvis

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Smart Prep (ROI-Descending Aorta just below Arch)
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 130 mL Omnipaque 350 or Isovue 370 mg/mL injected at 5 mL/sec
Comments:	1. Series 1 - Without Contrast 2. Series 2 - Arterial Phase 3. Series 3 (perform regional delay if concern for active bleed seen on arterial phase acquisition) - 2 Min Delayed Phase 3. Send 3 mm Axial Images to PACS 4. Send 2 mm Sagittal and Coronal Reconstructions to PACS 5. Send 3D Reformatted Images to PACS 6. Send thin slices to PACS 7. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With & Without Contrast:	AAA

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Becker 6/2024

Subject to change at the discretion of the radiologist due to clinical circumstances.

CTA Abd/Pelvis

Mesenteric Protocol

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Smart Prep (ROI-Descending Aorta just below Arch)
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 130 mL Omnipaque 350 or Isovue 370 mg/mL injected at 5 mL/sec
Comments:	1. Series 1 - Without Contrast 2. Series 2 - Arterial Phase 3. Series 3 - Venous Phase - 70 second delay 4. Send 3 mm Axial Images to PACS 5. Send 2 mm Sagittal and Coronal Reconstructions to PACS 6. Send 3D Reformatted Images to PACS 7. Send thin slices to PACS 8. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With & Without Contrast:	Mesenteric Ischemic Bowel

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Drs. King/Becker 10/2023

Subject to change at the discretion of the radiologist due to clinical circumstances.

CTA Abd/Pelvis

GI Bleed

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	See below.
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 130 mL Omnipaque 350 or Isovue 370 mg/mL injected at 5 mL/sec
Comments:	1. Series 1 - Without Contrast 2. Series 2 - Enteric Phase - Place ROI on aorta at level of diaphragm. Scan 25 seconds after ROI trigger of 150 HU. 3. Series 3 - 2 minute delays 4. Send 3 mm Axial Images (Series 1-3) to PACS 5. Send 3 mm Sagittal and Coronal Reconstructions (Series 2) to PACS 6. Send 3D Reformatted Images to PACS 7. Send thin images (Series 2) to PACS 8. Send thin images (Series 1-3) to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With & Without Contrast:	Clinical/laboratory presentation consistent with rapid GI bleed (estimated bleed rate of ≥ to 0.35 mL/min) which would be detectable with CTA

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Drs. Becker & Stradling 4/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

CTA Abd/Pelvis

For Kidney Donors

To be performed at IMMC only

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Thickness:	Variable, See comments
Interval:	Variable, See comments
Gantry Tilt:	None
SFOV:	Large
kVp:	140
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Arterial - 25 sec; Venous - 65 sec; Series 4 - 10 min
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 130mL Omnipaque 350 or Isovue 370 mg/ml injected at 5cc/second
Comments:	1. Series 1 - Without Contrast (5mm slice thickness) 2. Series 2 - Arterial Phase - Dome of Diaphragm to Iliac Crest (3 mm slice thickness) 3. Series 3 - Venous Phase - Dome of Diaphragm to Iliac Crest (3 mm slice thickness 4. Series 4 - 10 minute Delay - Top of Kidneys through Bladder (3 mm slice thickness) 5. Send Axial Images to PACS 6. Send 2 mm Sagittal and Coronal Reconstructions (Series 1-3) to PACS 7. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon) 8. Correct Order: CT CTA Abdomen / Pelvis W/WO contrast

Indications

With & Without Contrast: Examination of Potential Living Donor

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Drs. King & Smith 10/2024

CTA
Abd/Pelvis
For Kidney Transplant Recipients

*** Kidney Transplant Recipient Protocol - For patients already on dialysis and ordered by Drs. Chaudhry and Malik - To be performed at IMMC only***

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Ischial Tuberosities
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Smart Prep (ROI-Descending Aorta just below Arch)
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 130 mL Omnipaque 350 or Isovue 370 mg/mL injected at 5 mL/sec
Comments:	1. Series 1 - Without Contrast 2. Series 2 - Arterial Phase 3. Series 3 - Portal Venous Phase at approximately 1 minute 4. Send 3 mm Axial Images to PACS 5. Send 2 mm Sagittal and Coronal Reconstructions to PACS 6. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With & Without Contrast: Kidney Transplant Recipient - Only used for patients already on dialysis

**** For patients not on dialysis - Perform a CT Abd/Pelvis without contrast only****

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 7/2020

Subject to change at the discretion of the radiologist due to clinical circumstances.

CTA Renal Arteries

Anatomical Reference:	Xyphoid
Patient Position:	Supine
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Iliac Crest
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	120 (100 for small patients)
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Smart Prep (ROI-Descending Aorta just below Arch)
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 130 mL Omnipaque 350 or Isovue 370 mg/mL injected at 5 mL/sec
Comments:	1. Series 1 - Without Contrast 2. Series 2 - Arterial Phase 3. Send 3 mm Axial Images to PACS 4. Send 2 mm Sagittal and Coronal Reconstructions to PACS 5. Send 3D Reformatted Images to PACS 6. Send thin slices to PACS 7. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With & Without Contrast:	Hypertension, Stenosis

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. King 10/2023

Subject to change at the discretion of the radiologist due to clinical circumstances.

CTA Runoff

Anatomical Reference:	Xyphoid
Patient Position:	Supine; TAPE FEET TOGETHER (if possible) to prevent motion
Patient Orientation:	Feet First
Scan Range:	Dome of Diaphragm to Toes
Scout:	AP, Lateral if necessary
Scan Type:	Helical
Thickness:	3 mm, Recon as thin as possible
Interval:	3 mm, Recon as thin as possible
Gantry Tilt:	None
SFOV:	Large
kVp:	140
mAs:	Auto mA (minimum 50-maximum 420)
Scan Delay:	Smart Prep (ROI-Descending Aorta just below Arch)
Respiration:	Inspiration
DFOV:	Adjust to patient size
Recon Algorithm:	Standard
Contrast:	Oral: None IV: 150 mL Omnipaque 350 or Isovue 370 mg/mL injected at 5 mL/sec
Comments:	1. Series 1 - Without Contrast - Dome of diaphragm to toes 2. Series 2 - Arterial Phase - Dome of diaphragm to toes 3. Series 3 - Knees to toes - *ONLY if you see you lost the contrast bolus* - Set up prior to series 2 scan just in case you need it 4. Send 3 mm Axial Images to PACS 5. Send 2 mm Sagittal and Coronal Reconstructions (Series 2) to PACS 6. Send 3D Reformatted Images of Aorta and Lower Extremity Arteries to PACS 7. Send thin slices (Series 2 Only) to PACS 8. Send thin slices to 3D Workstation (Vitrea Bridge or TeraRecon)

Indications

With & Without Contrast:	Peripheral Arterial Disease, Gangrenous Extremities, Non-existent Distal Pulses

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Stradling 10/2023

Subject to change at the discretion of the radiologist due to clinical circumstances.

Coronary CTA

To be performed at IMMC and Iowa Radiology-Clive only

Anatomical Reference:	Top of shoulders	
Patient Position:	Supine	
Patient Orientation:	Feet First	
Scan Range:	Entire coronary circulation and heart	
Scout:	AP	
Scan Type:	Helical	
Rotation Time:	0.33 sec	
Acquisition Slice Thickness:	Cardiac score=30x0.6	Coronary CTA=64x0.6mm
Pitch:	Varied	
Recon Interval (mm):	Cardiac score=3x3	Coronary CTA=0.6mm x 0.3mm
Gantry Tilt:	None	
SFOV:	500 mm	
kVp:	120	
mAs:	Varied on patient body habitus	
Scan Delay:	Smart Prep (ROI-Ascending aorta above LCA, Scan Threshold-100 HU)	
Respiration:	Inspiration	
DFOV:	Varied	
Recon Algorithm:	B35f heartview medium ca score, mediastinum for cardiac score, I36f heartview medium ASA, CT angio for coronary CTA (SAFIRE-3)	

Contrast:

Oral: None

IV: 60 mL Omnipaque 350 mg/mL or equivalent water soluble contrast injected at 5 mL/sec followed immediately by a mixed bolus of 30mL Omnipaque 350 mg/mL or equivalent water soluble contrast and 30mL saline injected at 5 mL/sec.
May need to increase contrast amount with larger body habitus.
Injection of 40 mL saline at 5 mL/sec to flush.

Scans:

1. AP Scout
2. Non contrast of entire heart and vessels (calcium score)
3. Monitoring on the ascending aorta just above LCA (Trigger at 100 HU)
4. Gated scan to include entire coronary circulation and heart

Comments:

1. All helical scans are gated.
2. Calcium score prior unless indicated otherwise by ordering doctor (PACS) Qr36/Mediastinum
3. 65% phase (PACS and 3D workstation) 0.6mm x 3mm Bv41/CT Angio
4. 75% phase (PACS and 3D workstation) 0.6mm x 3mm Bv41/CT Angio
5. 80% phase (PACS and 3D workstation) 0.6mm x 3mm Bv41/CT Angio

Continued on next page

Reviewed by Dr. Wolford 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.

Coronary CTA - Routine Cont.

Comments:

6. 0-90% phase (3D workstation) 1mm x 1mm Bv41/CT Angio
7. Full FOV to include lungs (3D workstation and PACS) 5 mm x 5 mm Bf39/Mediastinum
8. 40% trigger (PACS and 3D workstation) 0.6mm x 0.3mm Bv41/CT Angio

***Manually push ECG gating image to PACS

9. If the ordering office feels the patient's heart rate will run higher than 65 BPM the day of the exam, they can prescribe 50-150 mg of oral Metoprolol for the patient to take 1.5 hours prior to the exam and the evening before the exam. A 0.4 mg Nitroglycerin tablet will be given sublingual 4 minutes prior to imaging.

Indications

With & Without Contrast: Chest Pain, Abnormal Stress Echo, Suspected Congenital Anomalies, Irregular Heart Rate

****Values will vary between machines. Use your own discretion when selecting these values.****

Reviewed by Dr. Wolford 1/2025

Subject to change at the discretion of the radiologist due to clinical circumstances.