CT Protocols

- **Notes:**

  - **Creatinine needed if:**
    - Diabetic, HBP requiring medication, on Metformin, over 60 years of age, kidney/renal problems (such as transplant, single kidney, kidney Ca, kidney surgery, decreased kidney function, or see a kidney/renal doctor).

  - **Patients with the following known or suspected tumors should have multiphase CT exams**
  - Follow Multiphase Liver CT protocol (abdomen or abdomen/pelvis, as ordered):
    - Neuroendocrine tumors (NET) (carcinoid, islet cell, pheochromocytoma, etc.)
    - GIST (gastrointestinal stromal tumors from any site)
    - Sarcoma
    - Thyroid
    - Adrenal malignancy (known)

    - If order includes Chest (i.e. Chest/Abdomen/Pelvis) scan times can be 25 sec / 75 sec / and 5-minute delay, however if scanner can accommodate, the preference is 35 sec. / 75 sec / and 5-minute delay.

    - If there is a question of whether or not the patient's malignancy or suspected malignancy is included above, please contact a body radiologist for clarification.

  - **A unique type of Multiphase CT study is done for:**
    - Liver (after IR treated) for follow up of IR treated liver tumors use Quad phase and add w/o study followed by 35 sec, 75 sec, 4 min) because there may be high attenuation material that might mimic enhancing tumor otherwise.
    - Pancreas (40 sec, 80 sec), use water for oral contrast 32 oz within 20 min of scan
      - Scans are in the late arterial phase and in Portal venous phase
    - Adrenal mass work up (w/o, scan at 70 sec, scan at 15 min)
    - CT Urogram (looking for renal / urothelial masses)

(STEREOTACTIC) STEALTH BRAIN TUMOR LOCALIZATION

REGION OF INTEREST:	BRAIN TUMOR; LOCATIONS OF FIDUCIALS/ CRANIAL APPARATUS
ORAL CONTRAST:	NONE
SCOUT FILM:	LATERAL
PHASE OF RESPIRATION:	PATIENT USUALLY SEDATED WITH ANESTHESIA
SLICE THICKNESS:	2 mm
ANATOMICAL COVERAGE:	Base of the skull through Vertex – NEUROSURGEON TO DIRECT AREA OF SCAN.
INTRAVENOUS CONTRAST:	Non-Ionic 100ml maximum when ordered

COMMENTS:

1. PATIENT IS USUALLY UNDER HEAVY SEDATION OR GENERAL ANESTHESIA. PATIENT IS SCANNED TABLE TOP, OR LOCKING DEVICE FOR HALO, AND SUPINE. HEAD CAN BE ON A SHEET OR TOWEL, LEVEL AND STRAIGHT IF NO HALO.
2. PATIENT MAY HAVE A DEVICE (HALO) BOLTED TO HIS HEAD BY THE NEUROSURGEON AND ASSISTS IN POSITIONING PRIOR TO SCAN.

INDICATION: BRAIN TUMOR

	Ax	**Ax**
Slice	2 x 2	2 x 2
Scan	W/O	WITH
Series Description	AX	AX +C

CODE STROKE ADULT BRAIN WITHOUT

REGION OF INTEREST:	BRAIN; Base of Skull to Vertex of Skull
FOV:	250mm (adjust to skull size)
SCOUT FILM:	LATERAL
SLICE THICKNESS:	4 mm x 4 mm
ALGORITHM:	STD/Body
INTRAVENOUS CONTRAST	NONE
COMMENTS:	Call Radiologist for reading while on the phone, call ED for RAV of reading and put into EPIC.
RECONSTRUCTIONS:	Axial, Sagittal, & Coronal - 4 x 4 mm Axial Bone - 2 x 2 mm

INDICATION: STROKE or STROKE symptoms within CODE STROKE time limits

** CODE STROKE IS TO BE DONE AS IMMEDIATE AS POSSIBLE. CALL RADIOLOGIST AFTER

	Ax	**Ax (Bone)**	**Sag**	**Cor**
Slice	4 x 4	2 x 2	4 X 4	4 x 4
Scan	W/O	W/O	W/O	W/O
Series Description	AX	AX BONE	SAG	COR

ROUTINE ADULT BRAIN with & without contrast

REGION OF INTEREST:	BRAIN; Base of Skull to Vertex of Skull
FOV:	250 mm (adjust to skull size)
SCOUT FILM:	LATERAL
SLICE THICKNESS:	4 mm
SLICE INTERVAL:	4 mm
ALGORITHM:	MED
INTRAVENOUS CONTRAST	1ml/pound up to max 100ml non-Ionic contrast Delay should be approx. 45 - 60 sec.

COMMENTS:

- Reconstruct algorithm.
    - Axial Bone
    - Axial, Sagittal & Coronal Soft Tissue
- A longer delay can be used on IVC if only looking for METS
- Techs need to detail site of trauma when typing in history
- Angle gantry to petrous ridge on all scans when possible.

INDICATION: HA'S, DIZZINESS, HEAD TRAUMA, METASTATIC CA

	Ax (Bone)	**Ax (Soft)**	**Sag (Soft)**	**Cor (Soft)**	**Ax (Bone)**	**Ax (Soft)**	**Sag (Soft)**	**Cor (Soft)**
Slice	2 x 2	4 x 4	4 X 4	4 x 4	2 x 2	4 x 4	4 X 4	4 x 4
Scan	W/O	W/O	W/O	W/O	WITH	WITH	WITH	WITH
Series Description	AX BONE	AX SOFT	SAG SOFT	COR SOFT	AX BONE +C	AX SOFT +C	SAG SOFT +C	COR SOFT +C

PEDIATRIC BRAIN

REGION OF INTEREST:	PEDIATRIC BRAIN
SCOUT FILM:	LATERAL
SLICE THICKNESS:	3mm x 3mm
ANATOMICAL COVERAGE:	BASE OF the SKULL through VERTEX
PITCH:	No Greater than 2 if done Helical.
INTRAVENOUS CONTRAST:	2ml/kg body weight, maximum 75ml when ordered.

COMMENTS:

1. Reconstruct algorithm.
    - Axial Bone
    - Axial, Sagittal & Coronal Soft Tissue
2. FOV should include entire head and soft tissue with visualization of the entire bony cranium.
3. Shield patient
4. X-Care, Care dose and IR reconstruction always used for optimal dose reduction
5. Check for motion.
6. Angle approximately 25 degrees caudad to Reid's base line, (if using sequential mode) thus superimposing the supraorbital ridge to avoid lens exposure if possible. (you Cannot Angle with some Helical scanners)
7. 3D images can be reconstructed if required for diagnosis.

INDICATION: HA, SEIZURES, SUSPECTED MASS, TRAUMA, BIRTHING COMPLICATIONS

	Ax (Bone)	**Ax (Soft)**	**Sag (Soft)**	**Cor (Soft)**	**Ax (Bone)**	**Ax (Soft)**	**Sag (Soft)**	**Cor (Soft)**
Slice	3 x 3	3 x 3	3 X 3	3 x 3	3 x 3	3 x 3	3 X 3	3 x 3
Scan	W/O	W/O	W/O	W/O	WITH	WITH	WITH	WITH
Series Description	AX BONE	AX SOFT	SAG SOFT	COR SOFT	AX BONE +C	AX SOFT +C	SAG SOFT +C	COR SOFT +C

POSTERIOR FOSSA

REGION OF INTEREST:	POSTERIOR FOSSA (always do head study with this protocol)
SCOUT FILM:	LATERAL
SLICE THICKNESS:	2 mm
SLICE INTERVAL:	2 mm
INFERIOR EXTENT:	FORAMEN MAGNUM
SUPERIOR EXTENT:	THIRD VENTRICLE
INTRAVENOUS CONTRAST:	Non-Ionic 75ml - 135ml maximum

Comments:

1. Do entire brain in conjunction with Posterior Fossa study at 4 mm

INDICATION: HA'S

	Ax (Bone)	Sag (Bone)	Cor (Bone)	Sag (Soft)	Cor (Soft)
Slice	2 x 2	2 X 2	2 x 2	2 X 2	2 x 2
Scan	W/O	W/O	W/O	W/O	W/O
Series Description	AX BONE	SAG BONE	COR BONE	SAG SOFT	COR SOFT

INTERNAL AUDITORY CANALS (IAC)

REGION OF INTEREST:	INTERNAL AUDITORY CANALS
SCOUT FILM:	LATERAL
SLICE THICKNESS:	1 mm
SLICE INTERVAL:	1 mm
INFERIOR EXTENT	EAM /TIP OF MASTOID AIR CELL
SUPERIOR EXTENT:	TOP OF PETROUS BONE (OUT OF MASTOID AIR CELLS)
INTRAVENOUS CONTRAST:	NON-IONIC – 75 ml or 100 ml maximum if ordered

COMMENTS:

1. Axial only with coronal reformats
2. Always Reconstruct each side individually for bone …FOV 9.6
3. Always reconstruct post fossa images with Bilat IAC
4. Position head as you would for normal head CT angle with supraorbital margin.

** FOR HISTORY OF ACOUSTIC NEUROMA, MRI PREFERRED OVER CT IF NOT A CONTRAINDICATION

INDICATION: LOSS OF HEARING, ACOUSTIC NEUROMA

	Ax (Bone)	**Cor (Bone)**	**Cor (Soft)**
Slice	1 x 1	1 X 1	1 x 1
Scan	W/O	W/O	WITH
Series Description	AX BONE	COR BONE	COR SOFT

TEMPORAL BONE

REGION OF INTEREST: TEMPORAL BONE

SCOUT FILM: LATERAL
SLICE OF THICKNESS: 0.5 mm
SLICE INTERVAL: 0.5 mm (Axial MPR both sides)
INFERIOR EXTENT: BASE OF PETROUS BONE OR TIP OF MASTOID
SUPERIOR EXTENT: THROUGH MASTOIDS
INTRAVENOUS CONTRAST: IF IVC ordered Non-Ionic 135ml maximum

COMMENTS:

1. Scan Axial with coronal reformats. No direct coronal
2. Cover entire mastoids
3. Reconstruction – Bone algorithm
    - Axial & Coronal whole head
    - Axial & Coronal limited FOV to left and right separately

INDICATION: Cholesteatoma, Trauma, Surgery, Chronic Otitis Media

	Ax (Bone) Whole Head	**Cor (Bone) Whole Head**	**AX (Bone) Left & Right**	**Cor (Bone) Left & Right**
Slice	1 x 1	1 X 1	.5 x .5	.5 x .5
Scan	W/O	W/O	W/O	W/O
Series Description	AX BONE	COR BONE	SAG BONE	COR BONE

SINUSES

REGION OF INTEREST:	AXIAL SINUSES
SCOUT FILM:	LATERAL
SLICE THICKNESS:	3 mm
SLICE INTERVAL:	3 mm (Never direct Coronal. Always helical scan with Coronal reformats)
INFERIOR EXTENT:	BASE OF MAXILLARY SINUSES
SUPERIOR EXTENT:	ABOVE TOP OF FRONTAL SINUSES
INTRAVENOUS CONTRAST:	NON-IONIC 75ml or 100 ml maximum if ordered

COMMENTS:

1. FOV 20, standard & bone algorithm.
2. Images should include entire orbits and anterior clinoids and as much mastoids as possible
3. Reconstruction
    - Axial, Sagittal, Coronal Bone
    - Axial soft tissue

INDICATION: SINUSITIS

	Ax (Bone)	Sag (Bone)	Cor (Bone)	Ax (Soft)
Slice	1 x 1	1 X 1	1 x 1	1 x 1
Scan	W/O	W/O	W/O	W/O
Series Description	AX BONE	SAG BONE	COR BONE	AX SOFT

STRYKER SINUS PROTOCOL

REGION OF INTEREST:	ENTIRE SINUSES, through head.
SCOUT:	LATERAL
SCAN PARAMETERS	120KV / 150 mAs (No care dose) .5 SEC. ROTATION, BONE / SHARP ALGORITHM.
SLICE THICKNESS:	1 mm
SLICE INTERVAL:	1 mm
POSTERIOR EXTENT:	BASE OF MAXILLA, INCLUDE SOFT PALATE (scan inferior to superior)
SUPERIOR EXTENT:	TOP OF HEAD (MUST SEE AIR)

COMMENTS:

1. Patient scanned axial, 250mm FOV, with coronal reformats, 3mm x 3mm Use 19cm/190mm FOV Send all to PACS.
2. Scan patient TABLETOP, (Sponge), not in head holder. Axial views. No angle.
3. Get patients upper teeth perpendicular as possible to table. If you must build up patients head to get their teeth perpendicular to table, use towels or washcloths. Do not cut any of the anterior anatomy.

INDICATION: SINUSITIS

	Ax (Bone)	Sag (Bone)	Cor (Bone)	Ax (Soft)
Slice	1 x 1	1 X 1	1 x 1	1 x 1
Scan	WITHOUT	WITHOUT	WITHOUT	WITHOUT
Series Description	AX BONE	SAG BONE	COR BONE	AX SOFT

FACIAL BONES, ORBITS, OPTIC NERVE, SINUSITIS, (MASS, CELLULITIS,)

REGION OF INTEREST:	ORBITS FOR TUMOR, MASS, OPTIC NERVE, AXIALS, FACIAL OR ORBITAL CELLULITIS
SCOUT FILM:	LATERAL
SLICE THICKNESS:	2 mm
SLICE INTERVAL:	2 mm
RECONSTRUCTION:	Axial, Sagittal & Coronal - bone & soft tissue – 2 x 2 mm
INFERIOR EXTENT:	BENEATH INFRAORBITAL RIDGE/BELOW MANDIBLE FOR FACIAL BONES
SUPERIOR EXTENT:	ABOVE FLOOR OF FRONTAL SINUS
INTRAVENOUS CONTRAST:	NON-IONIC 75 ml or max of 100 ml if ordered

COMMENTS:

1. Images should include entire orbits and anterior clinoid.

INDICATION: SINUSITIS, FACIAL/ORBITAL CELLULITIS, MASS OR TUMOR

	Ax (Bone)	**Sag (Bone)**	**Cor (Bone)**	**Ax (Soft)**	**Sag (Soft)**	**Cor (Soft)**
Slice	2 x 2	2 X 2	2 x 2	2 x 2	2 x 2	2 x 2
Scan	W/O	W/O	W/O	W/O	W/O	W/O
Series Description	AX BONE	SAG BONE	COR BONE	AX SOFT	SAG SOFT	COR SOFT

SELLA

REGION OF INTEREST: AXIAL SELLA
SCOUT FILM: LATERAL & AP
SLICE THICKNESS: 1 mm
SLICE INTERVAL 1 mm
POSTERIOR EXTENT: START BELOW SELLA
ANTERIOR EXTENT 2 - 3 cm ABOVE SELLA
INTRAVENOUS CONTRAST: NON-IONIC 100ml maximum

COMMENTS:

1. USE 140 KV 300+ MA
2. Sagittal & Coronal bone & soft tissue algorithm

INDICATION: PITUITARY TUMOR

	Ax	**Ax**	**Sag (Bone)**	**Cor (Bone)**	**Sag (Soft)**	**Cor (Soft)**
Slice	1 x 1	1 x 1	1 X 1	1 x 1	1 x 1	1 x 1
Scan	W/O	WITH	W/O	W/O	W/O	W/O
Series Description	AX	AX +C	SAG BONE	COR BONE	SAG SOFT	COR SOFT

CORONAL/AXIAL IMAGES OF THE CRIBRIFORM PLATE OR FACIALS FOR CSF LEAK

REGION OF INTEREST: THE CRIBRIFORM PLATE FOR CSF LEAK - Axial and Coronal if patient can tolerate position
SCOUT FILM: LATERAL
SLICE THICKNESS: 1 mm
SLICE INTERVAL: 1 mm
ANTERIOR EXTENT: THROUGH FRONTAL SINUS (NASION)
POSTERIOR EXTENT: ANTERIOR CLINOIDS

COMMENTS:

1. FOV 14, SOFT TISSUE AND BONE ALGORITHMS
2. CORONAL SHOULD BE PERPENDICULAR TO THE CRIBRIFORM PLATE, IF POSSIBLE.
3. AXIALS THROUGH THE FRONTAL SINUSES ARE DONE. BEGIN AT THE NASION AND CONTINUE UNTIL OUT OF THE SINUS.

INDICATION: CSF LEAK

	Ax (Bone)	**Cor (Bone)**	**AX (Soft)**	**Cor (Soft)**
Slice	1 X 1	1 x 1	1 x 1	1 x 1
Scan	W/O	W/O	W/O	W/O
Series Description	AX BONE	COR BONE	AX SOFT	COR SOFT

BASE OF BRAIN FOR NEURAL FORAMINA AND CRANIAL NERVE DISORDERS

REGION OF INTEREST: BASE OF BRAIN FOR NEURAL FORAMINA AND CRANIAL NERVE DISORDERS
SCOUT FILM: LATERAL
SLICE THICKNESS: 1 mm
SLICE INTERVAL 1 mm
INFERIOR EXTENT: BOTTOM OF FORAMEN MAGNUM
SUPERIOR EXTENT: THIRD VENTRICLE
INTRAVENOUS CONTRAST: NON-IONIC 100ml

COMMENTS:

1. HARD PALATE PERPENDICULAR WITH BASE OF SKULL (CHIN-UP) FOV 25, SOFT TISSUE AND BONE ALGORITHMS.
2. PATIENTS WITH FACIAL NERVE DISORDERS ALSO REQUIRE THESE VIEWS. EVEN IF ROUTINE HEAD ORDERED.
3. GIVE VERY SPECIFIC HX

INDICATION: FACIAL NUMBNESS, PAIN, TASTE ALTERATIONS, AND BELL'S PALSY

	Ax (Bone)	Cor (Bone)	Ax (Soft)	Cor (Soft)
Slice	1 X 1	1 x 1	1 x 1	1 x 1
Scan	WITH	WITH	WITH	WITH
Series Description	AX BONE +C	COR BONE +C	AX SOFT +C	COR SOFT +C

LARYNX

REGION OF INTEREST: LARYNX
SCOUT FILM: LATERAL
SLICE THICKNESS: 1 mm (3mm for Neck)
SLICE INTERVAL: 1 mm (Coronal & Sagittal thru Larynx) 3mm thru neck
SUPERIOR EXTENT: Orbits
INFERIOR EXTENT: AP window
INTRAVENOUS CONTRAST: Non-Ionic 135ml maximum

COMMENTS:

1. THE NECK SHOULD BE HYPEREXTENDED.
2. THE PATIENT SHOULD BE INSTRUCTED NOT TO SWALLOW DURING IMAGING.
3. A SMALL FOV (200mm) FOR LARYNX ONLY
4. REMOVE DENTAL WORK IF POSSIBLE.
5. THIS STUDY DONE IN CONJUNCTION WITH A NECK STUDY
6. PHONATION ("E") CAN BE USED FOR DISTENDING THE PYRIFORM SINUSES, SUPRAGLOTTIC TUMOR AROUND THE SINUSES, AND EPIGLOTTIC FOLDS

INDICATION: PARALYZED VOCAL CORD, HOARSENESS

	Ax (Bone)	Sag (Bone)	Cor (Bone)	AX (Soft)	Sag (Soft)	Cor (Soft)
Slice	1 X 1	1 x 1	1 x 1	1 x 1	1 x 1	1 x 1
Scan	W/O	W/O	W/O	W/O	W/O	W/O
Series Description	AX BONE	SAG BONE	COR BONE	AX SOFT	SAG SOFT	COR SOFT

NECK FOR PRIMARY HYPERPARATHYROIDISM

REGION OF INTEREST:	NECK AND MEDIASTINUM
SCOUT:	LATERAL OR A/P. BOTH IF NEEDED
PHASE OF RESPIRATION:	"STOP BREATHING, DON'T BREATHE OR SWALLOW "
SLICE THICKNESS:	3 mm
SLICE INTERVAL	3 mm (Coronal/Sagittal MPR)
SUPERIOR EXTENT:	Mid Orbits
INFERIOR EXTENT:	Carina
INTRAVENOUS CONTRAST:	NON-IONIC – 75 ml or 135 ml maximum if ordered
	Scan 1: W/O contrast Scan 2: 25 sec Delay Scan 3: 80 sec Delay

Comments:

- SAGITTAL AND CORONAL REFORMATS REQUIRED.

INDICATION: Parathyroid Adenoma, Ectopic parathyroid gland, Hyperparathyroidism.

	Ax	Ax	Sag (Bone)	Cor (Bone)	Sag (Soft)	Cor (Soft)
Slice	3 x 3	3 x 3	2 x 2	2 x 2	2 x 2	2 x 2
Scan	W/O	WITH	W/O	W/O	W/O	W/O
Series Description	AX	AX +C	SAG BONE	COR BONE	SAG SOFT	COR SOFT

NECK AND MEDIASTINUM

REGION OF INTEREST:	NECK AND MEDIASTINUM
SCOUT:	LATERAL AND A/P IF NEEDED
PHASE OF RESPIRATION:	"STOP BREATHING, DON'T BREATHE OR SWALLOW "
SLICE THICKNESS:	3 mm
SLICE INTERVAL	3 mm (Coronal/Sagittal MPR)
SUPERIOR EXTENT:	Mid Orbits
INFERIOR EXTENT:	AP Window
INTRAVENOUS CONTRAST:	NON-IONIC – 75 ml or 135 ml maximum

- IF STONE SUSPECTED DO W/WO STUDY
- ALL SWELLING, MASS OR OTHER PALPABLE AREAS NEED MARKED OR DOCUMENTED NOT ABLE TO PALPATE.
- NECK SOFT TISSUE SHOULD ALWAYS BE DONE WITH IV CONTRAST TO DIFFERENTIATE BETWEEN LYMPH NODES AND VESSELS.
- 45 SECOND DELAY
- FOR VOCAL CORD PARALYSIS; INFERIOR ASPECT OF SCAN; AP WINDOW/BRONCHI (see Larynx protocol)

INDICATION: NECK PAIN/SWELLING, DIFFICULTY SWALLOWING, NECK MASS, SALIVARY STONE

	Ax	**Ax**	**Sag (Bone)**	**Cor (Bone)**	**Sag (Soft)**	**Cor (Soft)**
Slice	3 x 3	3 x 3	3 x 3	3 x 3	3 x 3	3 x 3
Scan	W/O	WITH	W/O	W/O	W/O	W/O
Series Description	AX	AX +C	SAG BONE	COR BONE	SAG SOFT	COR SOFT

TRAUMA SPINE

REGION OF INTEREST:	CERVICAL, THORACIC, AND LUMBAR
CONTRAST:	No oral or IV
INSPIRATION:	QUIET BREATHING
SLICE THICKNESS:	2 mm
SLICE INTERVAL:	2 mm
SUPERIOR EXTENT:	APPROX, 1 ½ - 2-disc spaces ABOVE AREA OF CONCERN
INFERIOR EXTENT:	APPROX. 1 ½ - 2-disc spaces BELOW AREA OF CONCERN * Usually entire spine

- SCAN CONTINUOUS THROUGH AREA OF INTEREST.
- Reconstruction:
    - Axial – Bone & Soft tissue
    - Coronal – Bone
    - Sagittal – Bone & Soft tissue
- MPR'S ARE DONE IN BONE
- Off Axial Reformat (follow the spine, not the table)
- 3D IMAGES ARE TO BE DONE IF ORDERED ON SCRIPT OR AT RADIOLOGISTS REQUEST

INDICATION: TRAUMA, PAIN, FRACTURE

	Ax (Bone)	**Sag (Bone)**	**Cor (Bone)**	**Ax (Soft)**	**Sag (Soft)**
Slice	2 x 2	2 x 2	2 x 2	2 x 2	2 x 2
Scan	W/O	W/O	W/O	W/O	W/O
Series Description	AX BONE	SAG BONE	COR BONE	AX SOFT	SAG SOFT

SPINE NON-TRAUMA (CERVICAL, THORACIC, AND LUMBAR)

REGION OF INTEREST:	SPINE, CERVICAL, THORACIC, LUMBAR
CONTRAST:	No oral or IV
SCOUTS:	LATERAL & AP IF NEEDED
SLICE THICKNESS:	2 mm
SLICE INTERVAL:	2 mm
SUPERIOR EXTENT:	APPROX, 1 ½ - 2-disc spaces ABOVE AREA OF CONCERN
INFERIOR EXTENT:	APPROX. 1 ½ - 2-disc spaces BELOW AREA OF CONCERN

- USE PILLOW OR PAD UNDER KNEE FOR LUMBAR TO DECREASE ANGULATION OF L5-S1.
- ADULT OR CHILD WITH HISTORY OF SPONDYLOLYSIS DO L3-S1
- DISCOGRAM STUDIES START JUST ABOVE CONTRAST IN DISC AND END JUST BELOW CONTRAST.
- Off Axial Reformat (follow the spine, not the table)
- 3D IMAGES TO BE DONE ON SPINES IF ORDERED ON SCRIPT OR REQUESTED BY RADIOLOGISTS.
- Reconstruction: Axial, Sagittal, & Coronal – Soft Tissue and Bone

INDICATION: BACK PAIN, SPONDYLOSIS, SPINAL STENOSIS

	Ax (Bone)	**Sag (Bone)**	**Cor (Bone)**	**Ax (Soft)**	**Sag (Soft)**	**Cor (Soft)**
Slice	2 x 2	2 x 2	2 x 2	2 x 2	2 x 2	2 x 2
Scan	W/O	W/O	W/O	W/O	W/O	W/O
Series Description	AX BONE	SAG BONE	COR BONE	AX SOFT	SAG SOFT	COR SOFT

HEAD CT With & Without PERFUSION

REGION OF INTEREST: BRAIN AND VESSELS IF ORDERED
IV CONTRAST: ISOVUE 370 VISIPAQUE 320 OMNI 350
SLICE THICKNESS: 5 MM CONES 8i CINE 1 SECOND SCAN X 45-50 SECONDS
FOR PERFUSION IMAGES 700 + IMAGES

PROCEDURE: Scan must be completed and dictated within 45 minutes of order. (1) Routine head without iv contrast for most code stroke orders. If MD wants WITH AND WITHOUT study Perfusion and Angio

1. Routine head without (2) Angio head using no more than 100 ml of contrast. (3) Perfusion head study using 50 ml of contrast. (4) Reprocess head from Angio to regular head or brain cuts (5MM).
2. Send Angio Head images and 700 + perfusion head images to workstation. Work up angio brain and then work up perfusion images.
3. Send Head without, Reprocessed head with, and finished perfusion 4-5 images to PACS don't send all of perfusion raw images to PACS.
4. Contrast is injected at 4-5ml second (follow angio protocol rates for perfusion study) use 150 ml of contrast 100ml on angio then use 50ml on Perfusion study.
5. Work up Procedure for Perfusion
6. Click Perfusion images
7. Pick Perfusion 3
8. 3 Click on CT Perfusion (2nd) box
9. Apply Registration
10. Next
11. Adjust thresholds air and bone
12. Next
13. Create ellipse ROI adjust to size and put over artery Next
14. Same as above on vein put 2 additional ROI in brain tissue Next Adjust post enhancement images move back one number Next
15. Compute, close and save images 4 in all send to PACS

CTA HEAD WO & WITH (Angiography 3D)

REGION OF INTEREST: CIRCLE OF WILLIS
INTRAVENOUS CONTRAST: 135 ml max of ISOVUE 370
SCOUT: AP & LATERAL if needed.
RESPIRATION: QUIET BREATHING IN HEAD HOLDER
SLICE THICKNESS: 1 x 1 mm
RECONSTRUCTION: 1 x 1 mm
SUPERIOR EXTENT: TOP OF HEAD
INFERIOR EXTENT: BASE OF SKULL.

- Bolus tracking region of interest in Aortic arch
- Reconstruction:
  Axial, Sagittal, and Coronal 1 mm with separate FOV limited to head and neck
  Axial, Sagittal, and Coronal MIP for head

- STUDY DONE WO/W IV
- Acute Stroke: If Non-contrasted head has already been complete it does not need repeated.

INDICATION: KNOWN ANEURYSM, STROKE, CIRCULATORY DISEASE

	Ax	Ax	Sag	Cor	Ax MIP Head	Sag MIP Head	Cor MIP Head
Slice	1 x 1	1 x 1	1 x 1	1 x 1			
Scan	W/O	WITH	WITH	WITH	WITH	WITH	WITH
Series Description	AX	AX +C	SAG +C	COR +C	AX MIP HEAD +C	SAG MIP HEAD +C	COR MIP HEAD +C

CT ANGIOGRAPHY OF THE CAROTIDS

REGION OF INTEREST:	CAROTIDS
ORAL CONTRAST:	NONE
INTRAVENOUS CONTRAST:	Non-Ionic 135 ml maximum The bolus tracking region of interest in the Aortic arch.
SCOUT FILM:	AP & LATERAL IF NEEDED
PHASE OF RESPIRATION:	Stop breathing
SLICE THICKNESS:	1 mm
RECONSTRUCTION:	1 mm for Axial, Sagittal, & Coronal Sagittal & Coronal MIPs
SUPERIOR EXTENT:	JUST INFERIOR TO THE CIRCLE OF WILLIS.
INFERIOR EXTENT:	AORTIC ARCH AT ORIGIN OF GREAT VESSELS.
POST PROCESSING:	SAGITTAL AND CORONAL REFORMATS.

INDICATION: CAROTID STENOSIS, STROKE

	Ax	Ax	Sag	Cor	Sag MIP Neck	Cor MIP Neck
Slice	1 x 1	1 x 1	1 x 1	1 x 1		
Scan	W/O	WITH	WITH	WITH	WITH	WITH
Series Description	AX	AX +C	SAG +C	COR +C	SAG MIP NECK +C	COR MIP NECK +C

CTV HEAD W CONTRAST

REGION OF INTEREST; ENTIRE BRAIN, VEINS
ORAL CONTRAST; NONE
SCOUT/TOPOGRAM; LATERAL
INTRAVENOUS CONTRAST; Non-Ionic 100ml maximum
SLICE THICKNESS; 1 mm
SLICE INTERVAL; 1 mm
RECONSTRUCTION; 1 mm for Axial, Sagittal, & Coronal
Sagittal & Coronal MIPs
COMMENTS; MRV OF THE HEAD IS PREFERRED BY RADIOLOGIST

INDICATION: DURAL SINUS THROMBOSIS

	Ax	**Ax**	**Sag**	**Cor**	**Ax MIP Head**	**Sag MIP Head**	**Cor MIP Head**
Slice	1 x 1	1 x 1	1 x 1	1 x 1			
Scan	W/O	WITH	WITH	WITH	WITH	WITH	WITH
Series Description	AX	AX +C	SAG +C	COR +C	AX MIP HEAD +C	SAG MIP HEAD +C	COR MIP HEAD +C

STEALTH BRAIN CT

REGION OF INTEREST: ENTIRE HEAD INCLUDING SOFT TISSUE
CONTRAST: Non-Ionic
SCOUT IMAGES: LATERAL
PATIENT POSITION: SUPINE, HEAD IS FLAT AND STRAIGHT. NO ANGLED. SPONGE IF SURGICAL HEAD HOLDER USED.
SLICE THICKNESS: 2 X 2 mm with NO ANGLE
SUPERIOR EXTENT: ABOVE SKIN AND FIDUCIALS (MARKERS)
INFERIOR EXTENT: BELOW BASE OF SKULL

COMMENTS: 1-3 IS DONE BY SURGERY!

1. PT NEEDS 10 FIDUCIAL MARKER IN RANDOM ON HD, 2 WILL BE OVER TUMOR (REFER TO PREVIOUS EXAM)
2. PT NEEDS TO HAVE 10 SMALL AREAS OF HAIR SHAVED THEN CLEAN SKIN WITH ALCOHOL PREP PAD. APPLY FIDUCIALS AND PUT A BLACK DOT IN the CENTER WITH MAGIC MARKER.
3. GIVE PATIENT A SURGERY CAP AND SENT PATIENT EITHER TO SURGERY OR ROOM. FADUCIALS MUST STAY ON PATIENT.
4. SEND AXIAL IMAGES TO THE STEALTH MACHINE.
5. MAKE SURE SURGERY HAS STEALTH TURNED ON PRIOR TO STUDY.
6. DO NOT SHAVE ENTIRE HEAD.

INDICATION: BRAIN TUMOR

	Ax	**Ax**
Slice	2 x 2	2 x 2
Scan	W/O	WITH
Series Description	AX	AX +C

Adrenal Washout

- Oral Contrast: None
- IV Contrast:
    - Rate: 3cc/sec
    - Hyperlink
- Scan Range: Above dome of liver to iliac crest
- Timing: Without, 75 seconds and 15 min

		Ax			**Cor**			**Sag**	
Slice (mm)	3x3	3x3	3x3	3x3	3x3	3x3	3x3	3x3	3x3
Scan	w/o	75 sec	15 min	w/o	75 sec	15 min	w/o	75 sec	15 min
Series Description	AX	AX+C	AX DEL	COR	COR+C	COR DEL	SAG	SAG+C	AX DEL

- Reconstructions:

    All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

CT Urogram: 2 Phase with Furosemide

- Ask about allergies to Lasix or sulfa drugs. If yes, skip to without furosemide protocol.
- Patients who are receiving hydration for GFR may still receive Lasix.
- Preparation for Scan:
    - For patients without fluid restrictions:
        - Oral: water 3 (12 oz) cups over 45 to 60 minutes 1080 mL total (if fluids restricted see next bullet point). This can be done prior to arrival in department.
    - For people with fluid restrictions:
        - If receiving Lasix and can walk one block without shortness of breath, may give 150cc NS before entering the CT suite. You will still give the 100ml of normal saline listed below. This is a total of 250 mL of normal saline administered.

Split administration of bolus

- Administer normal saline 100 ml IV.
- Administer furosemide 10 mg IV.
- Scan abdomen without.
- Administer 1/2 of the Isovue 370 at 2+ ml/sec IV
- Wait 6 minutes
- Administer 1/2 of the Isovue 370 at 2+ ml/sec
- Wait 2 minutes
- Scan abdomen. Use 100 kVp or less, if possible.
- Reconstructions:
    - All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

	Ax	**Ax**	**Cor**	**Cor**	**Sag**	**Sag**
Slice	3x3	3x3	3x3	3x3	3x3	3x3
Scan	W/O	With	W/O	With	W/O	With
Series Description	AX	AX +C	COR	COR +C	SAG	SAG +C

CT Urogram: 2 Phase without Furosemide

- (Note longer delay and dosing change 1/3 early, 2/3 later compared to Lasix protocol)
- Preparation for scan.
    - For patients without fluid restrictions:
        - Oral water 3 (12 oz) cups over 45 to 60 minutes
        - 1080 mL total
        - For people with fluid restrictions: No oral or IV fluid.

** Split administration of bolus**

- Scan abdomen without.
- Administer 1/3 of the Isovue 370 at 2+ ml/ sec IV.
- Wait 8 minutes
- Administer 2/3 of the Isovue 370 at 2+ ml/sec
- Wait 2 minutes
- Scan abdomen. Use 100 kVp or less, if possible
- Reconstructions:
    - All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

	Ax	**Ax**	**Cor**	**Cor**	**Sag**	**Sag**
Slice	3x3	3x3	3x3	3x3	3x3	3x3
Scan	W/O	With	W/O	With	W/O	With
Series Description	AX	AX +C	COR	COR +C	SAG	SAG +C

CT Abdomen and Pelvis with Contrast (Trauma)

- Ask patient if they have hematuria.
- Contrast:
- Rate: 3 ml/sec
- Scan abdomen and pelvis at 70 seconds
- If patient has hematuria or if the CT technologist sees kidney injury on 75 second scan, scan abdomen and pelvis at 8-10 minutes.
- Reconstructions:
    - All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

	Ax	**Ax**	**Cor**	**Cor**	**Sag**	**Sag**
Slice	3x3	3x3	3x3	3x3	3x3	3x3
Scan	75 sec	Delay	75 sec	Delay	75 sec	Delay
Series Description	AX +C	DEL	COR	COR DEL	SAG	SAG DEL

CT Abdomen and Pelvis without and with (Acute GI Bleeding)

- Scan abdomen and pelvis without contrast media first
- Contrast
- Rate: 4ml/sec
- Scan abdomen and pelvis at 35 seconds
- Scan abdomen and pelvis at 90 seconds
- Reconstructions:
    - All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

	Ax	**Cor**	**Sag**	**Ax**	**Ax**	**Cor**	**Cor**	**Sag**	**Sag**
Slice	3x3	3x3	3x3	3x3	3x3	3x3	3x3	3x3	3x3
Scan	W/O	W/O	W/O	35 sec	90 sec	35 sec	90 sec	35 sec	90 sec
Series Description	AX	COR	SAG	AX EARLY ARTERIAL	AX PORTAL VENOUS	COR EARLY ARTERIAL	COR PORTAL VENOUS	SAG EARLY ARTERIAL	SAG PORTAL VENOUS

Cystogram

- 20 ml of Isovue 370 in 500 ml saline bag (do not remove any saline from bag)
- Scan Range: Top of bladder to below perineum
- Full bladder

	Ax	**Cor**	**Sag**
Slice	3x3	3x3	3x3
Series Description	AX +C	COR+C	SAG+C

- Post void:

	Ax	**Cor**	**Sag**
Slice	3x3	3x3	3x3
Series Description	AX DEL	COR DEL	SAG DEL

- Reconstructions:
    - All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

Enteroclysis:

- Procedure: Nasojejunal tube placed in fluoroscopy and small bowel infused with negative contrast
    - Some sites will infuse positive contrast.
- IV Contrast: optional
    - Rate: 3cc/sec
- Scan Range: Dome diaphragm to pubic symphysis

	Ax	Cor	Sag
Slice	3x3	3x3	3x3
Series Description	AX +C	COR +C	SAG +C

- Reconstructions:
    - All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

Enterography

- Patient Prep: Clear liquids after midnight.
- Oral Contrast: 450 ml volume (or local negative contrast agent) 60, 45 and 30 min prior to scan. 500 ml water 15 min prior to scan, if patient can tolerate.
- IV Contrast:
- Rate: 3mL/sec
- Timing: 70 sec
- Scan Range: Dome diaphragm to pubic symphysis

	Ax	**Cor**	**Sag**
Slice	3x3	3x3	3x3
Series Description	AX +C	COR +C	SAG +C

- Reconstructions:
    - All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

Liver (Multi-Phase)

- IV Contrast: .65 ml/pound with 135 ml max
  - Rate 4 cc/sec
  - Saline flush: 50 ml at 4 cc/sec
  - IV access: 20 gauge or larger
- Scan Range: Above dome of liver to iliac crest
- Reconstructions:
  - All scans all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.
- Pelvis: If a pelvis is ordered, please go through the pelvis on the 75 second (Portal Venous phase) only.
- If order includes Chest (i.e. Chest/Abdomen/Pelvis) scan times can be 25 sec / 75 sec / and 5-minute delay, if scanner cannot accommodate 35 sec.
- If patient is status post Interventional Radiology ablation therapy, then also ADD CT WITHOUT through the same area.

		Ax			**Cor**	
Slice	3x3	3x3	3x3	3x3	3x3	3x3
Scan	35 sec or Bolus	75 sec or Bolus	5 min or Bolus	35 sec or Bolus	75 sec or Bolus	5 min or Bolus
Series Description	AX LATE ARTERIAL	AX PORTAL VENOUS	AX DEL	COR LATE ARTERIAL	COR PORTAL VENOUS	CORDEL

	Sag	
3x3	3x3	3x3
35 sec or Bolus	75 sec or Bolus	5 min or Bolus
SAG LATE ARTERIAL	SAG PORTAL VENOUS	SAG DEL

- **Without Bolus Tracker**
  Scan abdomen at 35 seconds (arterial phase)
  Scan abdomen at 75 seconds (portal phase)
  Scan abdomen at 5 minutes (delayed phase)

With Arterial Bolus Tracker
Place Tracker at aorta at the diaphragms
18 seconds after tracker reaches 120 HU, scan abdomen (arterial phase)
48 seconds after tracker reaches 120 HU, scan abdomen (portal phase)
5 minutes after tracker reaches 120 HU, scan abdomen (delayed phase)

Pancreas

- Oral Contrast: Water
- IV Contrast: .65 ml/pound with 135 ml max
- Rate: 4 - 5cc/sec.
- Scan at 40 and 80 sec.
- Scan Range: Above dome of liver to iliac crest

	Ax	Ax	Cor	Cor	Sag	Sag
Slice	3x3	3x3	3x3	3x3	3x3	3x3
Scan	40 sec	80 sec	40 sec	80 sec	40 sec	80 sec
Series Description	AX EARLY ARTERIAL	AX PORTAL VENOUS	COR EARLY ARTERIAL	COR PORTAL VENOUS	SAG EARLY ARTERIAL	SAG PORTAL VENOUS

- Reconstructions:
    - All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

Radiation Oncology Therapy Planning Protocol

- Reconstructions:
  - All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

  - Add AX MIP 7x3 mm to chest portion of the protocol.

	AX Chest	**AX A/P**	**Ax Chest**	**AX Chest MIP**	**Cor Chest**	**Cor A/P**	**Sag Chest**	**Sag A/P**
Slice	3x3	3x3	3x3	7x3mm	2x2	3x3	2x2	3x3
Series Description	AX CH	AX	AX LUNG	AX MIP	COR CH	COR	SAG CH	SAG
Filter/ Recon Algorithm	Body	Body	Lung	Body	Body	Body	Body	Body

Renal Mass: 2 Phase with Furosemide

- Ask about allergies to Lasix or sulfa drugs. If yes, skip without furosemide protocol.
- Patients who are receiving hydration for GFR may still receive Lasix, per Dr. Kopecky.
- Preparation for Scan:
    - For patients without fluid restrictions:
- Oral: water 3 (12 oz) cups over 45 to 60 minutes 1080 mL total (if fluids restricted see next bullet point). This can be done prior to arrival in department.
    - For patients with fluid restriction:
- If receiving Lasix, and can walk one block without shortness of breath, may give 150cc NS before entering the CT suite. You will still give the 100ml of normal saline listed below. This is a total of 250 mL of normal saline administered.

*** Split administration of bolus****

- Administer normal saline 100 ml IV.
- Administer furosemide 10 mg IV.
- Scan abdomen without.
- Administer 1/2 of the Isovue 370 at 2+ ml/sec IV
- Wait 6 minutes
- Administer 1/2 of the Isovue 370 at 2+ ml/sec
- Wait 2 minutes
- Scan abdomen. Use 100 kVp or less, if possible.
- Reconstructions: All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

	Ax	**Ax**	**Cor**	**Cor**	**Sag**	**Sag**
Slice	3x3	3x3	3x3	3x3	3x3	3x3
Scan	W/O	With	W/O	With	W/O	With
Series Description	AX	AX +C	COR	COR +C	SAG	SAG +C

Renal Mass: 2 Phase without Furosemide

- (Note longer delay and dosing change 1/3 early, 2/3 later compared to Lasix protocol)
- Preparation for scan.
    - For patients without fluid restrictions:
- Oral water 3 (12 oz) cups over 45 to 60 minutes 1080 mL total
    - For patients with fluid restrictions:
    - No oral or IV fluid.

** Split administration of bolus**

- Scan abdomen without.
- Administer 1/3 of the Isovue 370 at 2+ ml/sec IV.
- Wait 8 minutes
- Administer 2/3 of the Isovue 370 at 2+ ml/sec
- Wait 2 minutes
- Scan abdomen. Use 100 kVp or less, if possible
- Reconstructions:
    - All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

	Ax	**Ax**	**Cor**	**Cor**	**Sag**	**Sag**
Slice	3x3	3x3	3x3	3x3	3x3	3x3
Scan	W/O	With	W/O	With	W/O	With
Series Description	AX	AX +C	COR	COR +C	SAG	SAG +C

Abdomen and Pelvis

- Routine Abd/Pelvis
- (Abdomen only & Pelvis Only)
- Oral Contrast only for following indications
    - Ovarian Cancer,
- IV Contrast:
    - Use P3t if available with max of 135 ml
    - Rate: 3cc/sec
        - Timing: 70 second
        - Scan Range: Dome diaphragm to pubic symphysis
        - Abdomen: Dome diaphragm through Iliac Crest
        - Pelvis only: Iliac Crest to below perineum
- Reconstructions:
    - All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the tables using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.

	Ax	**Cor**	**Sag**
Slice	3x3	3x3	3x3
Series without or oral only	AX	COR	SAG
Series IV	AX +C	COR +C	SAG +C

CT Colonography

Anatomical Coverage:	Entire Colon
Contrast:	CO2 via insufflator, No PO or IV contrast.
Phase of Inspiration:	Inspiration
Slice Thickness:	3 mm / 1 mm for reformats
Slice Interval:	3 mm / 1 mm for reformats
Superior Aspect:	2 cm above colon on AP scout
Inferior Aspect:	2 cm below rectum
Scanning and Procedure:	Scan 1 = Prone & Scan 2 = Supine
Storage:	PACs, Scout, Axial, MPR, Colon fly through software if available
Prep:	Must perform CT colonography prep prior to study. ** Reference CT Colonography Prep Instructions NPO 6 – 8 hours prior to study except sips of water and meds. Do not scan if patient has eaten within 1.5 hours before study.
Comments:	Whether patient is post Colonoscopy or prepping for just a colonography they should follow the Radiologists protocol for CT Colonography if post colonoscopy and a biopsy was done, it must be scheduled 4 weeks post biopsy per Radiologists.
Indication:	Rectal bleeding, failed colonoscopy, sigmoid redundancy

	Ax
Slice	3 x 1
Scan	W/O
Series Description	AX

CTA Abd & Pelvis with Runoff

REGION OF INTEREST: Abdominal Pelvic and Legs
COVERAGE: Dome of Liver through Feet
INTRAVENOUS CONTRAST: Non-Ionic 100 ml (135 ml maximum)
PHASE OF RESPIRATION: Inspiration
SLICE THICKNESS: 2 mm
SLICE INTERVAL: 2 mm
PITCH: No greater than 2
RECONSTRUCTION: Axial, Cor MPR, Sag MPR
Axial MIP, COR MIP and Sagittal MIPs 7 mm x 3 mm

Scan 1: Topogram 1536 mm or 1970 mm
Scan 2: Without from dome of liver through feet
Scan 3: With IVC bolus tracker on Aorta near renal arteries; dome of liver through knees
Scan 4: With from knees to toes directly after scan 2

Comments

- Thin set of images (1 mm x 0.5 mm) on IV study sent to 3DR labs for 3D vascular reformats
- MIPs done on all IV Imaging
- MPR's done on all w/o and with imaging

INDICATION: Vascular Disease

	Ax	**Ax**	**AX MIP**	**Cor MIP**	**Sag MIP**
Slice	2 x 2	2 x 2	7 X 3	7 X 3	7 X 3
Scan	W/O	WITH	WITH	WITH	WITH
Series Description	AX	AX +C	AX MIP +C	COR MIP +C	SAG MIP +C

Chest, Abdomen and Pelvis (Routine)

- Oral Contrast: 1.5 – 2-hour prep.
- Give additional cup of contrast when patient arrives in department.
- IV Contrast:
    - Use P3t if available with max of 135 ml
    - Rate: 3mL/sec
    - Scan Range: Chest: Thoracic inlet through all the lung
    - Abdomen/Pelvis: Dome of diaphragm through pubic symphysis.
    - Timing:
        - Chest: 35 sec
        - Abdomen & Pelvis: 75 sec

- Reconstructions:
    - All scans, all phases are to be reconstructed in three planes: axial, coronal, sagittal lined up with the patient (not the table) using a 3 mm slice width (or 3.75 mm if the scanner cannot create 3 mm) and 3 mm slice increment. If the patient is lying oblique (RPO or LPO) on the table, sagittal and coronal images must be aligned with the patient.
    - Add AX MIP 7x3 mm to chest portion of the protocol.

	Ax Chest	**Ax A/P**	**Ax Chest**	**Ax Chest MIP**	**Cor Chest**	**Cor A/P**	**Sag Chest**	**Sag A/P**
Slice	2x2	3x3	2x2	7x3mm	2x2	3x3	2x2	3x3
Scan	35 sec	75 sec	35 sec	35 sec	35 sec	75 sec	35 sec	75 sec
Series Description W/O IV	AX CH	AX	AX LUNG	AX MIP	COR CH	COR	SAG CH	SAG
Series Description IV	AX CH +C	AX +C	AX LUNG +C	AX MIP	COR CH +C	COR +C	SAG CH +C	SAG +C
Filter/Recon Algorithm	Body	Body	Lung	Body	Body	Body	Body	Body

Chest with or without contrast (Routine)

- Rate: 3mL/sec (if contrast ordered)
- Timing: 30 sec (if contrast ordered)
- Scan Range: Thoracic inlet through all the lung
- Scan at end of inspiration after hyperventilation

- **Lung Nodule**
  - If diagnosis for "lung nodule – initial or follow-up" do a routine Chest without.

	Ax	**Ax**	**Ax**	**Cor**	**Sag**
Size to PACS (mm)	2x2	2x2	7x3mm	2x2	2x2
Series Description without or oral only	AX	AX LUNG	AX MIP	COR	SAG
Series Description IV	AX +C	AX LUNG +C	AX MIP +C	COR +C	SAG +C
Filter/ Recon Algorithm	Body	Lung	Body	Body	Body

High Resolution Chest

- Prefer without contrast
- If exam is ordered with IV contrast, please confirm with ordering physician whether contrast is necessary, as contrast is not typically given for High Resolution Chest, except in certain circumstances.
- If ordered for an indication other than interstitial lung disease, please confirm the indication with the ordering provider and request modification of the order to routine chest CT, if high resolution is not indicated.

    - Rate: 3mL/sec: Scan Range: Chest: Thoracic inlet through all the lungs
    - Order of scan does not matter
    - In the event that a patient cannot lay prone, please obtain a decubitus with the affected side up view. Same reconstructions apply to this (these) views as the prone.

	Ax Prone Inspiration	**Ax Supine Inspiration**	**Ax Supine Inspiration**	**Ax Supine Expiration**	**Ax MIP from Supine Insp**	**Cor MIP from Supine Insp**	**Cor from Sup Insp**	**Sag from Sup Insp**
Size to PACS (mm)	2x2	2x2	2x2	2x2	7x3mm	7x3	2x2	2x2
Series Description without or oral only	AX PRONE	AX INSP LUNG	AX INSP	AX EXP	AX MIP	COR MIP	COR	SAG
Filter/Recon Algorithm	Lung	Lung	Body	Lung	Body	Body	Body	Body

Chest Angio Protocol PE

- Oral Contrast: None
- IV Contrast: Rate: 3.5 - 4 mL/sec
- Angiocath: 18 gauge or larger (smaller number) preferred.
- Timing: Typically, auto-timing ROI goes on RT Pulmonary artery, but varies with scanner
- Scan Range: Chest: Thoracic inlet through all the lungs.
- Breathing instructions: Stop breathing - unless too SOB, and then quiet breathing.

	Ax	**Cor**	**Sag**	**Ax Lung**	**Ax MIP**	**Sag MIP**	**Cor MIP**	**Left Oblique MIP**	**Right Oblique MIP**
Size to PACS (mm)	2x2	2x2	2x2	2x2	7x3mm	5x3	5x3	5x3	5x3
Series Description without or oral only	AX +C	COR +C	SAG +C	AX LUNG +C	AX MIP +C	SAG MIP +C	COR MIP +C	OBL MIP L	OBL MIP R
Filter/Recon Algorithm	Body	Body	Body	Lung	Body	Body	Body	Body	Body

Calcium Score

- Scan Range (top to bottom) is through heart:
- Scan at end inspiration
- Include calcium score color images and score results document.
- Send to PACS: small field of view images (to heart) with and without color coronary calcium mapped.
- Send to PACS: Large field of view images (to entire body or largest possible based on scan) 2 mm thick / every 2 mm (AXIAL (lung reconstruction kernel), and SAGITTAL, and CORONAL) planes
- Send to PACS: Large field of view images (to the entire body or largest possible based on scan), MIPS 7 mm thick / every 3 mm.

Plane	Ax	Ax	Ax	Ax	Cor	Sag
Size to PACS (mm)	2x2	2x2	2x2	7x3mm	2x2	2x2
FOV Small = to heart or requested area Large = to entire body (or as large as possible)	Small Calcium color map	Small No color map	Large	Large	Large	Large
Series Description	AX	AX	AX Lung	AX MIP	COR	SAG
Series Description IV (blank if none)						
Filter/ Recon Algorithm	Body	Body	Lung	Body	Body	Body
Documents to be sent to PACs include:	Score table	Score graph				

Coronary Overread

- Scan Range (top to bottom) is through heart or as directed by Cardiology or Vascular Surgery protocol
- Scan at end inspiration (or if different according to protocol)
- Send to PACS: Small field of view images (to heart or protocol area of interest)
- Send to PACS: Large field of view images (to entire body or largest possible based on scan) 2 mm thick / every 2 mm (AXIAL (lung and body reconstruction kernels), and SAGITTAL, and CORONAL) planes
- Send to PACS: Large field of view images (to the entire body or largest possible based on scan), MIPS 7 mm thick / every 3 mm.

Plane	Ax	Ax	Ax	Cor	Sag	3Ds / and other images
Size to PACS (mm)	2x2	2x2	7x3mm	2x2	2x2	
FOV Small = to heart or requested area Large = to entire body (or as large as possible)	Large	Large	Large	Large	Large	Per service protocol
Series Description	AX	AX Lung	AX MIP	COR	SAG	
Series Description IV (blank if none)	Ax +C	Ax LUNG +C	AX MIP +C	COR +C	SAG +C	
Filter/ Recon Algorithm	Body	Lung	Body	Body	Body	

Aortic Dissection – CT Chest without and CTA Chest & Abdomen with contrast

- IV Contrast:
  - Oral Contrast: None
  - IV: 18 ga
  - Use P3t if available with max of 135 ml
  - Rate: 3.5 - 4mL/sec
  - Timing: Typically, auto-timing ROI goes in descending aorta at the level of pulmonary artery and may depend on the speed of scanner.

- Scan Range:
  - Chest without portion: Thoracic inlet through all the lung.
  - C/A Contrasted portion: Thoracic inlet through aortic bifurcation (Bottom of L5)

- Reconstructions:
  - AX MIP 7 x 3 mm to chest portion of the protocol.
  - SAG MIP 5 x 5 for post contrasted chest and abdomen

	Ax Chest	**Ax Chest**	**Ax Chest MIP**	**Ax C/A**	**Cor C/A**	**Sag C/A**	**Sag C/A MIP**
Slice	2 x 2	2 x 2	7 x 3mm	2 x 2	2 x 2	2 x 2	5 x 5
Scan	without	without	without	timed	timed	timed	timed
Series Description W/O IV	AX CH	AX LUNG	AX MIP				
Series Description IV				AX CH ABD +C	COR CH ABD +C	SAG CH ABD +C	SAG CH ABD + C MIP
Filter/Recon Algorithm	Body	Lung	Body	Body	Body	Body	Body

CT Esophogram

- Order as a CT chest with & without PO contrast media (No IV contrast)
- This replaces the fluoroscopic esophogram for esophageal rupture/leak.

- Mix 20 ml Isovue 370 in 12 ounces (350 ml) water. Divide the contrast media into two cups, each containing 6 ounces.

- SCAN 1 (NO CONTRAST - SUPINE):
  - Place patient supine on CT scanner. Obtain scout views from the skull base to the iliac crests.
  - Perform very low dose CT scan from bottom of mandible to bottom of stomach without any contrast at all (no IV or oral).

- SCAN 2 (POST-CONTRAST - SUPINE):
  - With patient supine, turn the head to one side and ask the patient to drink 6 ounces of dilute Isovue using a straw, and immediately repeat the scan from bottom of mandible to bottom of stomach.

- SCAN 3 (POST-CONTRAST - PRONE):
  - If the patient is able, turn the patient prone, and obtain scout views from the skull base to iliac crest. Plan the 3rd scan from bottom of mandible to bottom of stomach. Then ask the patient to turn the head to the side and drink 6 ounces of dilute Isovue using a straw. Immediately scan from bottom of mandible to bottom of stomach.

- IF THE PATIENT CANNOT SWALLOW
  - Ask the referring physician to place a nasoesophageal tube with the tip of the tube just BELOW the carina. The position of the tube must be evaluated on the scout views to make sure that it is NOT in the trachea. Ask the referring physician or nurse to adjust the tube position, if necessary. Perform the NO CONTRAST - SUPINE scan as outlined above. Then do the POST-CONTRAST scans as outlined above, with one exception: Inject only 50 ml dilute contrast media through the tube before each scan.

CT Low Dose Lung Screening

- No oral or IV contrast
- Positioning: Center the patient supine within the gantry with arms above head.
- Scan Range: Top of lungs through the bottom of lungs
- Respiration: Patient should be instructed to hold his/her breath at end of inspiration during entire scan.
- Radiation Dose Management: CTDIvol must be ≤ 3.0 mGy for a standard sized patient as measured using a 32-cm diameter CTDI phantom.
    - By definition, a standard sized patient is approximately 5'7" and 155 pounds or 170 cm and 70 kg, with BMI = 24.

Lung Screening Follow-up

- This exam should be used for 3 and 6-month short-term follow-up lung cancer screening exams.
    - If this is an annual lung cancer screening follow-up exam, perform using the CT Low Dose Lung Screening protocol.
- No oral or IV contrast
- Positioning: Center the patient supine within the gantry with arms above head.
- Scan Range: Top of lungs through the bottom of lungs
- Respiration: Patient should be instructed to hold his/her breath at end of inspiration during entire scan.
- Image quality/radiation dose must be higher than a low dose lung screening exam for diagnostic purposes, but should be lower than the image quality/radiation dose of a standard CT chest without.

	Ax	**Ax Lung**	**Cor**	**Sag**	**Ax MIP**	**Cor MIP**
Size to PACS (mm)	2x2	2x2	2x2	2x2	7x3	7X3
Series Description	AX	Ax LUNG	COR	SAG	AX MIP	COR MIP
Filter/Recon Algorithm	Soft Tissue	Lung	Soft Tissue	Soft Tissue	Soft Tissue	Soft Tissue