



**School of Medicine  
and Public Health**

UNIVERSITY OF WISCONSIN-MADISON

# UW Quick Protocolling Guide

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Manufactured in USA

## Introduction

To facilitate the proper pairing of scanner protocol to patient indications, we have created a quick protocolling guide. This guide has two sections. Section 1 is a more verbose explanation of each CT protocol provided in the UW CT Protocol Collection. Section 2 contains quick references guides, which we intend for you to print out. These one page quick reference guides are for use in reading rooms or scanner side to aide radiologists and technologists respectively in choosing the right protocol.

To Use this manual:

1. Read Section 1, “Design Philosophies”.
2. Read Section 2, “Quick References Guides”.
3. Hold a meeting to review the materials presented in Sections 1 and 2 to determine if your sites has any modifications to this workflow.

Note, the content of this manual is not intended to replace physician oversight of your patient’s care. This manual was created to aide in your site achieving a more efficient workflow resulting in fewer patient re-examinations and less calls between the reading room and the scanner. The content of this manual should be carefully reviewed by your sites CT technologists and Radiologists before implementing the guidelines we provide here.

For more information, please visit <https://www.radiology.wisc.edu/> or email Professor Szczykutowicz at [tszczykutowicz@uwhealth.org](mailto:tszczykutowicz@uwhealth.org) or our Lead CT Technologists Carrie Bartels at [cbartels2@uwhealth.org](mailto:cbartels2@uwhealth.org) or Rachel Bladorn at [rbladorn@uwhealth.org](mailto:rbladorn@uwhealth.org)

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# Design Philosophy - Abdominal

GE Protocol	Protocol Type	Protocol No. on Scanner	Design Philosophy
Abd/Pelvis	Abdominal	6.1/6.2/6.3	This is standard abdomen pelvis protocol. It is the default protocol for the vast majority of studies. This one is useful when a general screening protocol is needed.
Abd/Pelvis - R/O Hernia	Abdominal	(Use routine abd/pelvis protocol)	This protocol is intended for the evaluation of hernias. It asks the patient to perform a Valsalva maneuver during the scan to enhance the prominence of any hernia.
High Image Quality Cancer Follow-Up Abd/Pelvis	Abdominal	6.7/6.8/6.9	Higher image quality version of the routine abdomen pelvis protocol. This protocol is to be used for cancer follow-up on patients with pathology known to be of a subtle nature. The order should specifically ask for this version of the abdomen pelvis routine protocol at the time of placing the order. Typically, a determination would be made based on age and disease process (usually dependent on whether they could have metastatic disease to the liver).
Abd/Pelvis - Flank Pain	Abdominal	6.10/6.11/6.12	This protocol is primarily targeted for the first-time evaluation of obstructing renal calculus. It is a non-contrast study; therefore, not optimal for imaging other causes of abdominal pain. However, it may suffice in situations where the disease processes are not subtle. We discourage it for appendicitis.
Abd/Pelvis - Pre-IVC Filter Removal	Abdominal	6.73/6.74/6.75	This protocol is used to assess for both the position and for the presence of clot in an IVC filter prior to removal. IV contrast is used and images are obtained 180 seconds after contrast injection to optimize opacification of the inferior vena cava and iliac veins.
Low Dose Renal Stone (including limited follow-up)	Abdominal	6.13/6.14/6.15	This protocol is intended for follow-up of patients with known kidney stones; those status post lithotripsy; or those presenting to the emergency department with typical flank pain and are known to have kidney stones. Image resolution is satisfactory for identifying calculi, but not optimal for other pathology.
Abd/Pelvis - Colonography	Abdominal	6.16/6.17/6.18	This protocol is used to screen the colon for polyps or colonic mass disease. Patients undergo bowel preparation prior to the scan, and are then scanned in the supine and prone positions following colonic CO2 insufflation via rectal balloon-tipped catheter. The supine-prone positioning is meant to displace any retained fluid and fully expose all parts of the colon between the two views. A right lateral decubitus view can be added if distention is suboptimal in a colonic segment. The study is performed without IV contrast and at low dose as it is used in screening asymptomatic patients in most cases. If a patient has a known colon cancer and the referrer desires screening of the colon combined with assessment for metastatic disease, IV contrast can be administered on the supine view.
Chest/Abd/Pelvis with IV Contrast	Abdominal	5.4/5.5/5.6	This protocol is most commonly applied to patients with neoplasm that may affect the entire torso, but is not expected to affect the head and neck.
Chest/Abd/Pelvis without IV Contrast	Abdominal	5.7/5.8/5.9	This scan is usually performed for the evaluation of tumor or other conditions that may affect the entire torso in patients who cannot get IV contrast due to allergy or renal failure.
Abd/Pelvis - Urography	Abdominal	6.22/6.23/6.24	For patients < 45 years old, this protocol is optimized for viewing the kidneys and the renalcollecting system. The most common indication is hematuria.

Urothelial Tumor Follow-up	Abdominal	6.70/6.71/6.72	This protocol will be for patients age > 45 years old with known urothelial cancer (bladder or ureters) and NO current evidence of or suspected metastatic disease. Also, some of these patients will not have a bladder (so no need for those to void as they will have a urostomy)  If they have metastatic disease, routine CT A/P will suffice.
Abd-Liver - Biphasic	Abdominal	6.25/6.26/6.27	This protocol is optimized to evaluate cirrhotic patients and suspected liver tumors. It is also applied for the evaluation of hypervascular metastatic disease to the liver.
Abd-Liver - Triphasic	Abdominal	6.28/6.29/6.30	This protocol is optimized for the work-up of a potential liver transplant recipient. It has a high resolution arterial phase for precise hepatic arterial anatomy; a late arterial phase for the detection of tumor; and a portal/ parenchymal phase for the demonstration of varices and other possible pathology. Finally, a three-minute delayed phase is performed to satisfy the UNOS requirement for HCC detection.
Abd-Liver - Hepatocellular Carcinoma (HCC)	Abdominal	6.82/6.83/6.84	This protocol, which is used to rule out HCC, is similar to the biphasic liver protocol, except it includes an additional delayed phase as mandated by UNOS.
Abd-Adrenal Gland - Adenoma	Abdominal	6.31/6.32/6.33	This protocol is optimized for the characterization of adrenal enlargement specifically for a suspect adenoma. It would not be protocol of choice to rule out pheochromocytoma.
Abd-Pancreas - Pancreas Cancer (Neoplasm Screening)	Abdominal	6.40/6.41/6.42	This scan is used in patients where there is suspicion of pancreas mass. The first phase is scanned in the late arterial phase. Since pancreatic adenocarcinoma is hypovascular, it is best detected at 40 seconds post contrast when the normal glandular tissue enhances optimally and the hypovascular tumor does not (optimizes contrast between the lesion and the background pancreas). The second phase is portal venous, to evaluate the solid organs, particularly the liver, for metastatic disease and for routine evaluation of the abdomen and pelvis.  Also for preoperative evaluation of known pancreatic neoplasm. It is optimized to detect vascular compromise.
Abd/Pelvis - Kidney Tumor	Abdominal	6.49/6.50/6.51	This protocol is optimized to evaluate patients with suspicion or evaluation of small renal neoplasm.
CTA Abd - Renal Donor	Abdominal	6.52/6.53/6.54	This protocol is optimized to evaluate the potential renal transplant donor.
Abd-Small Bowel - Enterography	Abdominal	6.55/6.56/6.57	This protocol is optimized for the evaluation of the small bowel. It is specifically designed for inflammatory bowel disease.
CTA Abd - Obscure GI Bleed	Abdominal	6.58/6.59/6.60	This protocol is optimized to evaluate the source of obscure gastrointestinal bleeding.
CTA Abd - Mesenteric Ischemia	Abdominal	6.61/6.62/6.63	This protocol is optimized to evaluate for mesenteric ischemia.
CTA Abd/Pel - Active Bleeder	Abdominal	6.79/6.80/6.81	If concern for ACTIVE bleeding in the Abd/Pelvis, need to identify source, consider active bleeder protocol. Post-Surgery/Intervention. Dropping hemoglobin of unclear source.
Trauma - Chest	Abdominal	5.22/5.23/5.24	This protocol is optimized for the emergency evaluation for aortic injury, as well as any other sequel of trauma. This is tailored for rapid deceleration injury. Note: Routine creatinine cut-off for IV contrast administration does not apply in a trauma.
Trauma - Chest/Abd/Pelvis	Abdominal	5.25/5.26/5.27	Emergency evaluation for aortic injury and/or organ disruption. Note: Routine creatinine cut-off for IV contrast administration does not apply in a trauma.
Trauma - Abd/Pelvis	Abdominal	6.4/6.5/6.6	Emergency evaluation for traumatic organ disruption. This is usually reserved for a direct blow to the abdomen or low velocity MVA. Note: Routine creatinine cut-off for IV contrast administration does not apply in a trauma.
Cystogram	Abdominal	8.10/8.11/8.12	In the trauma setting, to evaluate bladder for trauma induced leak. (Typically performed when the standard trauma scan is inconclusive for a bladder leak.)  In the non-trauma setting, specifically for the evaluation of bladder tumor and to evaluate for non-traumatic or post-operative bladder leak.
Body Pelvis	Abdominal	8.16/8.17/8.18	This is a standard or routine examination of the pelvis meant to assess for pelvic pathologies that are not hypervascular.

# Design Philosophy - Chest

GE Protocol	Protocol Type	Protocol No. on Scanner	Design Philosophy
Chest - Standard (Routine & High-Resolution)	Chest	5.1/5.2/5.3	This protocol is designed to address nearly all indications for chest CT while maintaining very low radiation exposure levels. It includes detailed information on the lungs, airways, and soft tissues. High-resolution images for evaluating the lungs are a central part of this protocol, avoiding the need to rescan patients who have diffuse lung disease. Although intravenous contrast material can be administered at the discretion of the protocolling radiologist, for the vast majority of indications, contrast is not needed.
Chest - Low Dose Follow-up/Screening	Chest	5.10/5.11/5.12	This protocol was designed for follow-up of nodules, pleural effusions, and other abnormalities using significantly lower dose than the standard CT. For nearly all patients, the effective dose will be below 3 mSv, typically in the 1 - 2 mSv range. This protocol is also designed to be used for lung cancer screening. It meets the technical standards put forth by the American College of Radiology and the Centers for Medicare and Medicaid Services (CMS).
Chest - CTA for PE	Chest	5.16/5.17/5.18	This protocol is nearly identical to the routine chest CT protocol, and reconstructed axial images are identical. Multiplanar MIPs are included to meet CPT code requirements. The contrast injection protocol is designed to limit the number of bolus failures and maximize opacification of the pulmonary vasculature.
Chest - Dynamic 3D Airway	Chest	5.70/5.71/5.72	This protocol is designed to evaluate the central airways, particularly to assess for tracheobronchomalacia or excessive dynamic airway collapse. In addition to standard high-resolution images of the lungs, the forced expiratory images accentuate collapsibility of the trachea and central bronchi. This protocol includes additional reformations including minimum intensity projections (MinIPs) and optional 3-D virtual bronchoscopic images, which referring providers might find informative. For patients who have a recent volumetric thin-section CT of the chest, the expiratory sequence of this protocol performed alone may be sufficient, minimizing additional radiation exposure. Because the breathing technique is different than traditional end-expiratory chest CT, proper training of technologists and coaching of patients with close radiologist oversight will maximize the utility of this protocol.

# Design Philosophy - Cardiovascular

GE Protocol	Protocol Type	Protocol No. on Scanner	Design Philosophy
Non-Gated CTA (Chest/Abd/Pelvis)	CV	5.28/5.29/5.30	Evaluate for known or suspected type "B" (descending) aortic dissection, intramural hematoma (IMH), aneurysm, leak, tear, or vasculitis.
Retrospectively-Gated CTA Chest (Non-Coronary)	CV	5.31/5.32/5.33	Used to evaluate the heart and great vessels (aorta and pulmonary arteries) in patients with higher rates or in patients in which cardiac function is also being assessed. This is frequently used in patients with congenital heart disease that have contra-indication for MRI.
Gated Chest and Non-Gated Abd/Pelvis CTA	CV	5.34/5.35/5.36	Used to evaluate patients with ascending aorta aneurysm in addition thoracoabdominal aortic aneurysms. Retrospective gating is used to minimize the delay between the gated chest and the non-gated abdomen and pelvis sections.
Prospectively-Gated Coronary CTA	CV	5.37/5.38/5.39	Used to evaluate the coronary arteries in patients with appropriate heart rates.
Retrospectively-Gated Coronary CTA	CV	5.40/5.41/5.42	Used to evaluate the coronary arteries in patients with higher rates or in patients in which cardiac function is also being assessed.
TAVI CTA	CV	5.43/5.44/5.45	Evaluation of patients being considered for trans-catheter aortic valve replacement (TAVR). This includes a retrospectively-gated CTA of the heart to evaluate the aortic root for implantation of the valve and a non-gated CTA chest abdomen and pelvis to evaluate the aorta and iliofemoral arteries to assess access.
Prospectively-Gated CTA Chest (Non-Coronary)	CV	5.46/5.47/5.48	Evaluate for ascending aortic aneurysm, dissection, or injury. Evaluate cardiac or vascular abnormality without cardiac motion. (Note: A prospectively-gated chest CTA cannot be combined with a non-gated CTA abdomen/pelvis. If gated chest is need along with CTA abdomen/pelvis, use retrospective gating.)
Subclavian CT Venogram	CV	5.55/5.56/5.57	Evaluation the central veins in the upper chest and arms at a 60 second delay.
Prospectively-Gated Left Atrial Appendage	CV	5.73/5.74/5.75	Evaluation for left atrial thrombus, pre-op for device (Watchman (TM))implant. Includes two scan phases, a CTA on expiration and a 30 second delay. Both phases are prospectively gated.
Upper Extremity CTA	CV	4.10/4.11/4.12	To evaluate upper extremity ischemia. The scan includes vascular imaging from the aortic arch to the finger tips.
Lower Extremity CTA	CV	9.13/9.14/9.15	For iliac occlusive disease, peripheral vascular disease, and patients with a "cold foot".
Post-Endostent Non-Con Volume Change (Abd/Pelvis only)	CV	6.43/6.44/6.45	Measure abdominal aortic aneurysm volume after endovascular repair. If the volume is stable or has decreased since the prior examination, no hemodynamically-significant endoleak is present.

# Design Philosophy - Musculoskeletal

GE Protocol	Protocol Type	Protocol No. on Scanner	Design Philosophy
Bony Pelvis/Hips/SI/Femur/FAI (Without Metal) and Bony Pelvis/Hips/SI/Femur/FAI (With Metal)	MSK	8.1/8.2/8.3 and 8.4/8.5/8.6	This protocol is designed to examine the cortex of the pelvic ring and acetabuli. Scans of the Bony Pelvis are most often obtained in the setting of acute trauma, or in the evaluation of fracture, SI joints, and prosthesis. Orthopedic surgeons may request post-operative scans to assess healing, hardware, or osteolysis.
Knee/Tibia (Without Metal) and Knee/Tibia (With Metal)	MSK	9.3 and 9.4	The primary indication for a knee CT is to assess the alignment and degree of displacement of fracture fragments, particularly at the articular surfaces. These can also be used to assess the integrity of the bone around prosthesis. On rare occasions, a CT will be done immediately after an arthrogram of the knee.
Ankle/Foot/Distal Tibia (Without Metal) and Ankle/Foot/Distal Tibia (With Metal)	MSK	9.1 and 9.2	There is one single scanning protocol for all ankles and feet, which is typically used to evaluate for trauma. In most cases it is desirable to scan both ankles/feet at the same time.
Femoral Anteversion/Lower extremity rotational study	MSK	9.8/9.9/9.10	This protocol is a non-contrast CT through bilateral hips, knees, and ankles (excluding the femur, tibia, and fibula shafts) to allow for measurement of the version angles of the femora and, if desired, tibiae.
Shoulder/Humerus (With or Without Metal)	MSK	4.1/4.2/4.3	A routine shoulder CT (non-arthrogram) is used to evaluate for fractures of the scapula and/or proximal humerus, dislocation, shoulder prosthesis, or masses/infection in a patient who is not MR compatible. The primary indication for a shoulder arthrogram CT is to evaluate the rotator cuff and labrum in a patient who is not MR compatible.
Elbow/Forearm (Without Metal) and Elbow/Forearm (With Metal)	MSK	4.6 and 4.7	This primary indication is to evaluate for fracture, dislocation, or osteochondritis. The elbow is the most difficult joint to scan as it is usually difficult to optimally position the elbow, particularly when it is in a cast.
Wrist (Without Metal) and Wrist (With Metal)	MSK	4.8 and 4.9	This scan is used to evaluate for wrist fracture, and similar to the elbow, it is important to position the arm over the head, with the arm as straight as possible.
Soft Tissue Extremity with IV Contrast	MSK	9.24/9.25/9.26	This protocol is used for detection or characterization of SOFT TISSUE mass or infection. Bony detail is not important for these scans which use a doselevel similar to an extremity CTA. If there is concern for bony involvement, please consider respective MSK bone protocol.
Chest Wall/Clavicle/AC Joint/SC Joint/Sternum/Ribs	MSK	4.13/4.14/4.15	Detection or characterization of fractures, evaluation of treated fractures to evaluate the progress of osseous healing or adequacy of fracture fixation. Also for the evaluation of arthritis, mineralized bone and soft tissue lesions, and to evaluate osteoarthritis. For infection, contrast will likely be needed.

# Design Philosophy - Neuroradiology

GE Protocol	Protocol Type	Protocol No. on Scanner	Design Philosophy
Brain - Routine and Pediatric NAT/Trauma (Helical Mode)	Neuro	1.1/11.1/11.2	For routine head imaging and emergent imaging including trauma, hemorrhage, hydrocephalus, tumor, and preliminary stroke screening. May need to add contrast for more sensitive evaluation of tumor or infection.
Brain - Helical Scan with Angled Axial Reformations	Neuro	1.2/11.3/11.4	Use this protocol when the head cannot be properly positioned for a routine helical head scan. Example: when you cannot move the patient's head into proper position (trauma, cervical collar, rigid neck). For routine head imaging and emergent imaging including trauma, hemorrhage, hydrocephalus, tumor, and preliminary stroke screening. May need to add contrast for more sensitive evaluation of tumor or infection.
Brain (Axial Mode)	Neuro	1.3/11.5/11.6	Helical mode should be used routinely for adult head CT scans. Only use axial mode when you cannot move the patient's head into proper position (trauma, cervical collar, rigid neck), and do not wish to perform a helical scan with angled axial reformats. This axial mode can also be used in unstable patients in the ED when the CT scan time must be expedited.
Stealth - Stereotactic Head (Whole Brain Treatment Planning)	Neuro	1.10/11.11/11.12	This is a protocol which delivers thin section images for use in whole brain radiation treatment planning, intraoperative neuronavigation, and cranioplasty planning. Image requirements for the software associated with these uses varies, and verification of compatibility is recommended.
Orbit - Routine	Neuro	2.1/12.1/12.2	For evaluation of infection, inflammatory, or neoplastic processes may add contrast as needed to increase sensitivity. May also be used for trauma, blunt or penetrating, localized to the orbit. Not to evaluate diffuse facial trauma or infection/inflammatory processes, as this requires a CT maxillofacial.
Facial Trauma - Routine	Neuro	2.5/12.9/12.10	Maxillofacial CT done for evaluation of facial trauma, blunt or penetrating, facial infections or inflammation, as well as assessment of congenital abnormalities. Contrast may be added for sensitivity, particularly in infection, as warranted. 3D reconstructions may be performed if requested by clinical service.
Sinuses - Diagnostic	Neuro	2.7/12.13/12.14	For evaluation of routine sinus inflammatory disease, assessment of bone involvement from infectious, inflammatory, or neoplastic processes, and sinonasal neoplasms. May add contrast as needed typically for non-routine sinus inflammatory disease. Not for evaluation of facial trauma or orbital processes.
Temporal Bone (without Contrast)	Neuro	2.10/12.18/12.19	For evaluation of hearing loss, congenital abnormalities, infection, trauma, and neoplasms. Contrast may be added as needed for infection or neoplasms. Used in conjunction with MRI to evaluate neoplasms typically unless contraindication to MRI.
Temporal Bone (with Contrast Only or with & without Contrast)	Neuro	2.11/12.20/12.21	This protocol adds contrast to the standard CT temporal bone, for use in cases of inflammation / infection or concern for sigmoid sinus compromise. This protocol is also used for cases in which there is a concern for a cerebellopontine angle mass causing sensorineural hearing loss.

Adult Neck - Routine	Neuro	3.1/3.2/3.3	For evaluation of head and neck cancer (pre and post treatment), infection, soft tissue trauma, or inflammatory processes. Not for evaluation of cervical spine trauma or suspected vascular injury.
Pediatric Neck - Routine	Neuro	13.1.1/13.2.1/13.4.1/13.6.1/13.8.1	This is an age-specific protocol designed to give a diagnostic and appropriately low dose examination through the neck. This protocol is for evaluation of cervical lymphadenopathy, developmental anomalies (such a branchial cleft cysts), as well as infectious, and inflammatory conditions within the pediatric neck.
Neck (Parathyroid Adenoma) Adult	Neuro	3.5/3.6/3.7	Indications include hypercalcemia, parathyroid adenoma (suspected or confirmed), and parathyroid surgical planning. On early arterial and delayed contrast enhanced images the enhancement of parathyroid adenomas can be confused with the intrinsically CT hyperdense thyroid gland. This protocol includes an additional non contrast phase to enable more confident detection and discrimination of parathyroid adenomas from the adjacent thyroid tissue.
Neck (Papillary Thyroid Hypervascular) Adult	Neuro	3.13/3.14/3.15	Hypervascular tumor, especially concern for papillary thyroid cancer metastasis.
Adult Cervical Spine (without Metal) and Adult Cervical Spine (With Metal)	Neuro	3.16/3.17/3.18 and 3.19/3.20/3.21	For evaluation of spine trauma, degenerative disease, infection, and bone tumors. May add contrast as needed. Not for primary evaluation of soft tissues.
Adult Thoracic Spine (without Metal) and Adult Thoracic Spine (with Metal)	Neuro	7.4/7.5/7.6 and 7.13/7.14/7.15	For evaluation of trauma, degenerative disease, infection, and bone tumors. May add contrast as needed.
Adult Lumbar Spine (without Metal) and Adult Lumbar Spine (with Metal)	Neuro	7.1/7.2/7.3 and 7.10/7.11/7.12	For evaluation of trauma, degenerative disease, infection, and bone tumors. May add contrast as needed.
Stroke Deluxe - Total Cerebrovascular	Neuro	1.6/1.13/11.16/11.17	For evaluation of stroke, vascular trauma, aneurysm, vasospasm, and atherosclerotic disease. Requires administration of IV contrast.
CTA Head Only (Stenosis, Aneurysm, Unknown Bleed)	Neuro	1.7/11.18/11.19	For evaluation of intracranial stenosis, aneurysm, vascular malformation, unknown bleed, vasospasm.
CTA Neck Only (Cerebrovascular Disease)	Neuro	3.11/11.22/11.23	Assessment of atherosclerotic disease, trauma with suspected vascular injury, or vascular neoplasms. Requires administration of IV contrast.
CT Venography	Neuro	1.9/11.24/11.25	This protocol consists of a slightly delayed phase of vascular imaging, for use in cases of suspected venous sinus thrombosis or occlusion.
Brain Post Thrombolysis Helical (GSI)	Neuro	1.4/11.13/11.14	This protocol is for post thrombolysis patients who may have contrast staining or hemorrhage in the tissues of the brain - we use iodine overlays to visualize hemorrhage from Iodine.
Peds Low Dose Hydrocephalus	Neuro	11.31/11.32	Low Dose evaluation of ventriculostomy shunt - concern for hydrocephalus, evaluate ventricle size
Pediatric Cervical Spine	Neuro	13.1.11/13.2.11/13.4.11/13.6.11/13.8.11	Evaluate trauma, neck pain, cervical stenosis, radiculopathy, fracture, fixation hardware May add contrast as needed.
Pediatric Lumbar Spine	Neuro	17.1.1/17.2.1/17.4.1/17.6.1/17.8.1	Evaluate trauma, neck pain, cervical stenosis, radiculopathy, fracture, fixation hardware May add contrast as needed.
Pediatric Thoracic Spine	Neuro	17.1.2/17.2.2/17.4.2/17.6.2/17.8.2	Evaluate trauma, neck pain, cervical stenosis, radiculopathy, fracture, fixation hardware May add contrast as needed.

# Design Philosophy - Pediatrics

GE Protocol	Protocol Type	Protocol No. on Scanner	Design Philosophy
Routine Abdomen/Pelvis	Peds	16.1.1/16.2.1/16.4.1/16.6.1/16.8.1 --- for Higher Image Quality: 16.1.6/16.2.6/16.4.6/16.6.6/16.8.6	For evaluation of nonspecific abdominal pain, abscesses in postoperative patients or acutely ill inflammatory bowel disease patients, fever of unknown origin, as well as for appendicitis in outpatients. Additionally used for initial diagnosis and follow-up of abdominal neoplasm when concurrent chest CT imaging is not indicated.
Acute Appendicitis - Abdomen/Pelvis	Peds	16.1.1/16.2.1/16.4.1/16.6.1/16.8.1 --- for Higher Image Quality: 16.1.6/16.2.6/16.4.6/16.6.6/16.8.6	A low dose protocol for patients in whom the only clinical concern is to rule out appendicitis. This will not image the lung bases and will minimally image the inferior aspects of the solid organs.
Renal Stone/Flank Pain	Peds	16.1.2/16.2.2/16.4.2/16.6.2/16.8.2 --- for Higher Image Quality: 16.1.7/16.2.7/16.4.7/16.6.7/16.8.7	This protocol aims to evaluate patients with renal colic or hematuria in whom renal and bladder ultrasound has been unable to identify a source for the symptoms or on whom renal and bladder ultrasound cannot be performed.
Biphasic Liver	Peds	16.1.3/16.2.3/16.4.3/16.6.3/16.8.3 --- for Higher Image Quality: 16.1.8/16.2.8/16.4.8/16.6.8/16.8.8	*IF Ever there is a special request for a Pediatric Biphasic Liver study. Please use the Triphasic protocol and delete group 1 (early arterial) and use late arterial and portal venous phase.  Please verify need for two phases with Staff Radiologist prior to scanning.
Triphasic Liver	Peds	16.1.3/16.2.3/16.4.3/16.6.3/16.8.3 --- for Higher Image Quality: 16.1.8/16.2.8/16.4.8/16.6.8/16.8.8	This protocol should only be ordered by surgeons for liver tumor evaluation prior to surgical resection in order to fully assess the tumor's relationship to the hepatic arteries, portal veins, and hepatic veins. This will also assess for variant arterial or venous anatomy.
Trauma Abdomen/Pelvis	Peds	16.1.4/16.2.4/16.4.4/16.6.4/16.8.4 --- for Higher Image Quality: 16.1.9/16.2.9/16.4.9/16.6.9/16.8.9	This protocol is designed to evaluate patients who have suffered from blunt or penetrating trauma for possible internal injuries. Delayed images may be required at the radiologist's discretion to evaluate for active bleeding, but the field of view should be limited to the area of concern only so as to keep radiation dose as low as possible. This protocol should always be done following administration of IV contrast as evaluation for solid organ injuries, and to a lesser extent bowel/mesenteric injuries is significantly limited on non-contrast examinations. This is especially true in pediatric patients with little mesenteric fat.

Chest - Standard (Routine & High-Resolution)	Peds	15.1.1/15.2.1/15.4.1/15.6.1/15.8.1 --- for Higher Image Quality: 15.1.8/15.2.8/15.4.8/15.6.8/15.8.8	This non-contrast protocol is performed to evaluate the lung parenchyma for evidence of interstitial lung disease, bronchiectasis, or aspiration. As pediatric patients have little mediastinal fat, evaluation for mediastinal or hilar lymphadenopathy, as well as mediastinal pathology in general, would be limited.
Chest with IV Contrast	Peds	XXX --- for Higher Image Quality: xxxxx	This protocol is designed to further evaluate patients with chest infections such as pneumonia with or without empyema, neoplasm, fever of unknown origin, vascular rings and slings, as well as mass lesions such as congenital cystic adenomatoid malformation and sequestration. Additionally, this could be used in evaluation of patients who have suffered blunt or penetrating trauma to the chest only.
Chest Pectus	Peds	15.1.3/15.2.3/15.4.3/15.6.3/15.8.3 --- for Higher Image Quality: 15.1.10/15.2.10/15.4.10/15.6.10/15.8.10	Technique for the pectus excavatum protocol was optimized for evaluating the bony thorax. These images allow for precise calculation of the Haller and correction indices, as well as for pre-surgical planning.
CTA Chest for PE	Peds	15.1.4/15.2.4/15.4.4/15.6.4/15.8.4 --- for Higher Image Quality: 15.1.11/15.2.11/15.4.11/15.6.11/15.8.11	This protocol is designed to evaluate patients who are suspected of having pulmonary embolism.
Routine Chest/Abdomen/Pelvis	Peds	15.1.5/15.2.5/15.4.5/15.6.5/15.8.5 --- for Higher Image Quality: 15.1.12/15.2.12/15.4.12/15.6.12/15.8.12	This protocol is intended to initially diagnose and follow-up malignancy and to evaluate for infection/fever of unknown origin in patients with nonspecific symptoms or who are immunocompromised.
Trauma Chest/Abdomen/Pelvis	Peds	15.1.6/15.2.6/15.4.6/15.6.6/15.8.6 --- for Higher Image Quality: 15.1.13/15.2.13/15.4.13/15.6.13/15.8.13	This protocol is designed to evaluate patients who have suffered from blunt or penetrating trauma for possible internal injuries. Delayed images may be required at the radiologist's discretion to evaluate for active bleeding, but the field of view should be limited to the area of concern only so as to keep radiation dose as low as possible. This protocol should always be done following administration of IV contrast as evaluation for vascular and solid organ injuries, and to a lesser extent bowel/ mesenteric injuries is significantly limited on non-contrast examinations. This is especially true in pediatric patients who have little mediastinal and mesenteric fat.
Peds Chest Dynamic 3D Airway	Peds	15.1.2/15.2.2/15.4.2/15.6.2/15.8.2 --- No higher image quality version of this protocol	This protocol is designed to evaluate the central airways, particularly to assess for tracheobronchomalacia or excessive dynamic airway collapse. In addition to standard high-resolution images of the lungs, the forced expiratory images accentuate collapsibility of the trachea and central bronchi. This protocol includes additional reformations including minimum intensity projections (MinIPs) and optional 3-D virtual bronchoscopic images, which referring providers might find informative. For patients who have a recent volumetric thin-section CT of the chest, the expiratory sequence of this protocol performed alone may be sufficient, minimizing additional radiation exposure. Because the breathing technique is different than traditional end-expiratory chest CT, proper training of technologists and coaching of patients with close radiologist oversight will maximize the utility of this protocol.

# Neuro Protocol Quick Guide

When in doubt, please ask/double check/call referring provider!

Protocol	Indication(s)
Routine head w/o	Mental status change, trauma, stroke, fall, intracranial hemorrhage, hydrocephalus
Peds head without and 3D	For non-accidental trauma (NAT)
Orbit w/o	Orbital Mass, Foreign Body, Trauma, Orbital , proptosis
Orbit with contrast	Periorbital cellulitis
Facial Trauma	Facial Trauma / Reconstruction, Maxillofacial surgery follow-up
Craniosynostosis	Craniosynostosis, Cleft lip, Cleft Palate, septo-optic dysplasia
Pituitary Gland and Cavernous Sinus	Pituitary Macroadenoma, Pituitary Mass, Hypogonadism, Hyperprolactinemia, Cavernous sinus mass, suprasellar mass
Stealth/Stereotactic Head	Stereotactic guidance imaging for operating room
Sinus-Diagnostic	Rhinosinusitis, Sinusitis, Nasal Discharge, Facial pain, Sinus surgery planning
Sinuses Follow-up Adult	Sinus exam for patients with prior studies, low dose exam
T-bone without	Hearing loss, conductive hearing loss, sensorineural hearing loss, otitis, otalgia, temporal bone fracture, trauma
T-bone without and with contrast	Otitis / mastoiditis with concern for abscess, intracranial spread, venous thrombosis , otitis externa, mastoiditis.
Neck with contrast	Neck mass, globus sensation, lymphadenopathy, head and neck cancer evaluation/follow-up, pharyngitis, tonsillar or peritonsillar abscess, neck abscess
Salivary gland	Salivary gland swelling, Sialadenitis, Sialolith
Parathyroid adenoma	Hypercalcemia, parathyroid adenoma (suspected or confirmed), parathyroid surgical planning.
Brachial Plexus	Brachial neuropathy, arm weakness / pain, brachial plexopathy
Papillary Thyroid Hypervascular	Hypervascular tumor, especially concern for papillary thyroid cancer metastasis.
C-Spine/T-spine/L-spine	Trauma, neck pain, cervical stenosis, radiculopathy, fracture, evaluate fixation hardware
Stealth/Stereotactic Spine	Surgical planning
Stroke Deluxe	Stroke, mental status change, dissection, arterial embolism
CTA Head only	Stenosis, Aneurysm, Unknown Bleed
CTA Neck only	Carotid Stenosis, Vertebral stenosis, dissection, trauma, hemorrhage
Venography	Venous Sinus Thrombosis
GSI post thrombolysis	Patients post thrombolysis
Peds Low Dose Hydrocephalus	Evaluation of ventriculostomy shunt - concern for hydrocephalus, evaluate ventricle size

# Chest Section Indication Guidance

When in doubt, please ask/double check/call referring provider!

Protocol	Indication(s)
Routine w/o contrast	Lung cancer, mediastinal abnormalities, lymphoma, esophageal cancer, metastases, empyema, pleural effusion, lung nodules, chest wall lesions, chest wall deformities
Routine w/ contrast	Pulmonary Arteries, Vascular structures
Low Dose/Follow up/Screening	Patients under 70-years-old for follow-up of: lung nodule(s), lymphadenopathy, diffuse lung disease, or pleural collection. Unintentional weight loss and all lung cancer screening
Veran	When specifically requested in order from interventional pulmonology
Trauma	When specifically ordered as trauma CT. Use routine chest when thoracic spine not being reconstructed from data set
CTA for Pulmonary Embolism	Known or suspected pulmonary embolism. Acute or chronic PE Double rule out (PE and aortic dissection) After AVM embolization
Dynamic Airway	To evaluate for tracheo(broncho)malacia and dynamic airway collapse (be sure to have technologist check expiratory images with radiologist before patient gets off table). Airway stenosis, tumor, tracheo(broncho) malacia.

Modifier	Indication(s)
	Clinical trial requirements (stated in order)
Contrast	Lung cancer when ordered with contrast Renal cell carcinoma when ordered with contrast Known large mediastinal mass when ordered with contrast Trauma when thoracic spine not being reconstructed Acute or chronic PE and acute aortic pathology
Expiratory	Obstructive lung disease Chronic cough Unexplained chronic or worsening dyspnea Lung transplant recipient (for chronic rejection) Allogeneic hematopoietic stem cell transplant recipient for chronic GVHD)
Prone	Evaluate for asbestosis When specifically requested because of indeterminate findings on previous CT scan

# CV Protocol Quick Guide

**When in doubt, please ask/double check/call referring provider!**

Please use the RevolutionCT scanner for all CTA chests when possible. If your site does not have a RevolutionCT, use your HD Discovery 750 or other 64 slice CT scanner.

Type B (decending)aortic dissectionintramural hematoma (IMH), aneurysm, leak, tear, or vasculitis.	Non-Gated CTA (Chest/Abd/Pelvis)
rule out endoleak	Post-Endostent Non-Con Volume Change (Abd/Pelvis only)
Evaluate for calcium in the Coronary arteries	Calcium Scoring
Evaluate for known or suspected type A (ascending) aortic dissection with possible involvement of aortic valve and/or coronary arteries.	Retrospectively-Gated CTA Chest
Known or suspected type A aortic dissection with possible involvement of aortic valve and/or coronary arteries, extending into abdomen/pelvis.	Gated Chest and Non-Gated Abd/Pelvis CTA
R/O arterial injury, embolus, vasculitis, peripheral vascular disease in the upper extremity	Upper Extremity CTA
For iliac occlusive disease, peripheral vascular disease, and patients with a "cold foot". For patients with "cold foot" use complete coverage	Lower Extremity CTA
Evaluate for ascending aortic aneurysm, dissection, or injury. Evaluate cardiac or vascular abnormality without cardiac motion.	Prospectively-Gated CTA Chest (Non-Coronary)
Evaluate abdominal wall vasculature for surgical planning for free flap	Abdominal Wall Flap CTA
For imaging of the coronaries.	Prospectively-Gated Coronary CTA
For imaging of the coronaries.	Retrospectively-Gated Coronary CTA
Pre scan before a TAVI procedure	TAVI CTA
Evaluate the central veins in the upper chest and arms.	Subclavian CT Venogram
Evaluate for ascending aortic aneurysm, dissection, or injury. Evaluate cardiac or vascular abnormality without cardiac motion	Prospectively-Gated CTA Chest Triple R/O (Non-Coronary)
Evaluation for left atrial thrombus, pre-op for device (Watchman (TM)) implant.	Prospectively-Gated Left Atrial Appendage
Evaluation of congenital heart disease/abnormalities	Pediatric CTA Gated Chest
Evaluation of congenital heart disease/abnormalities	Pediatric CTA non Gated Chest
Evaluation for any anomalies in the coronary arteries and Kawasaki disease (mucocutaneous lymph node syndrome).	Pediatric Prospectively-Gated Coronary CTA

# Body Protocol Quick Guide

When in doubt, please ask/double check/call referring provider!

Indication(s)	Protocol	Oral Contrast Type
RCC, NET (hypervascular mets)	Biphasic abdomen, routine pelvis	Water
Cancers with possible hep met disease. (EXCEPTIONS: Not for lymphoma, testicular ca, RCC/NET, prostate ca, discuss in young pts)	High quality cancer follow up	Positive Contrast, see protocol
Cholangiocarcinoma	High quality cancer follow up 12 min delay with routine a/p protocol	Water
Cirrhosis, HCC	R/o HCC	Water
Cirrhosis, eval for transplant	Liver Transplant recipient work up	Water
Possible liver donor	Liver donor workup	Water
Pre liver resection, post-transplant	Consider triphasic liver	Water
Abdominal pain, Pancreatitis	Routine abdomen/pelvis	Positive Contrast, see protocol
Assess for hernia	Hernia protocol	Positive Contrast, see protocol
Assess for pancreas cancer, assess resectability. (But if known metastatic or unresectable pancreas cancer, see above, high quality cancer follow up)	Pancreas cancer	Water
Pancreas transplant	Consider CTA pancreas tx if requested	Water
Mesenteric ischemia	Mesenteric ischemia (default DECT)	Water
Active bleeding/active GI bleeding	CTA Abd/Pel -Active Bleeder	None
Occult GI bleed (non-acute)	GI bleeding protocol	Breeze
Assess for hematoma (RP hematoma), no active bleed	Non con A/P	None
Crohn with acute pain/complication	Routine abdomen/pelvis, + oral	Positive Contrast, see protocol
Crohn/IBD, assess disease status	CT enterography (alt MRE)	Breeze
Acute flank pain	Flank pain protocol	Water
Known stone disease, assess stone burden	Low dose flank pain or limited stone f/u	Water
Hematuria age <45 years	Routine CT urography	Water
Known TCC, "High risk", Hematuria age > 45 years	Urothelial tumor follow-up	Water
Known TCC, follow up for mets, pancreas cancer follow up	High quality cancer follow up	Positive Contrast, see protocol
Characterize renal mass. (If known RCC, assess for mets, see above, biphasic protocol)	Renal tumor protocol	Water
Assess for clot in IVC filter, CT venogram	IVC filter protocol	None
Bariatric post op, assess leak. (if unable to drink, call surgical team before scanning without oral contrast or changing protocol)	Bariatric post-op	Positive Contrast, see protocol - must drink 100-200 ml

# Peds Protocol Quick Guide

## All PEDS Body CT scans need to be protocolled

When in doubt, please ask/double check/call referring provider!

Please remember that we should not be doing non-contrast enhanced scans prior to giving contrast in pediatric patients. Also, if you receive an order for imaging multiple overlapping body regions, please consult with the referring provider if any overlap is actually needed. Usually, a given body region can be scanned just once. In other words, multiphasic imaging is usually not performed or needed in pediatrics. These practices will decrease radiation dose.

<b>Abdominal pain, r/o abscess, neoplasm, fever of unknown origin. Small bowel obstruction in patients with h/o prior surgery</b>	<b>Routine Abdomen/Pelvis</b>
<b>RLQ pain. Evaluate for appendicitis.</b>	<b>Acute Appendicitis - Abdomen/Pelvis</b>
<b>Suspected urolithiasis in setting of equivocal renal/bladder ultrasound</b>	<b>Renal Stone/F flank Pain</b>
<b>Preoperative planning, liver tumor evaluation, evaluate hepatic artery/portal vein patency, upon surgeon request. Alternatively, MR with eovist contrast might be helpful.</b>	<b>Triphasic Liver</b>
<b>Blunt or penetrating trauma</b>	<b>Trauma Chest/Abdomen/Pelvis or Trauma Abdomen/Pelvis</b>
<b>Chest with contrast: evaluation for osteosarcoma metastatic disease</b>	<b>Chest - Standard (Routine &amp; High-Resolution)</b>
<b>Chest without contrast: evaluation for all other types (non osteosarcoma) of metastatic disease</b>	<b>Chest - Standard (Routine &amp; High-Resolution)</b>
<b>Eval for chest wall deformities, Haller index and corrections indices in pectus excavatum.</b>	<b>Chest Pectus</b>
<b>Evaluate for airway stenosis, tumor or tracheo (broncho) malacia</b>	<b>Peds Chest Dynmaic 3D airway</b>
<b>Known or suspected pulmonary embolism</b>	<b>CTA Chest for PE</b>
<b>Neoplasm, fever of unknown origin, infection. Metasatic disease workup/follow-up.</b>	<b>Routine Chest/Abdomen/Pelvis</b>
<b>For evaluation of femoral head position following casting in patients with developmental dysplasia of the hip.</b>	<b>SPICA Low Dose Bony Pelvis</b>

# MSK Protocol Quick Guide

When in doubt, please ask/double check/call referring provider!

*If the patient has metal in the area of interest, please use the metal protocol. If your scanner has MAR, use that with the regular dose protocol instead of the 140 kV higher dose (with metal) version of the protocol*

Indication	Protocol
For evaluation of the cortex of the pelvic ring and acetabuli, typically in the setting of acute trauma. This protocol is also used for Femoroacetabular Impingement (FAI).	Bony Pelvis/Hips/SI/Femur/FAI (Without Metal)
For evaluation of the rotation angle of the femoral necks relative to the femoral condyles, bilaterally. This protocol may also be used for tibial torsion imaging requests.	Femoral Anteversion/Lower extremity rotational study
Assess the alignment and degree of displacement of fracture fragments, particularly at the articular surfaces. Also for the evaluation of arthritis, mineralized lesions, and to evaluate the bone surrounding metallic implants.	Knee/Tibia
Evaluation of treated fractures, fracture fixation, assess progress of osseous healing, arthritis, mineralized lesions, osteochondral lesions of the joints, and to evaluate the bone surrounding metallic implants. This protocol is also indicated in patients have undergone surgical ankle or hindfoot fusion (arthrodesis) to assess the extent of osseous union.	Ankle/Foot/Distal Tibia
Evaluation of the progress of osseous healing, fracture fixation, characterization of fractures, arthritis, mineralized lesions, and to evaluate the bone surrounding metallic implants. Shoulder CT is also indicated in patients with shoulder dislocation to evaluate complicating factors such as prolonged or irreducible dislocation	Shoulder/Humerus
Evaluation of the progress of osseous healing, fracture fixation, characterization of fractures, arthritis, osteochondral lesions, mineralized bone and soft tissue lesions, and to evaluate the bone surrounding metallic implants. CT is also useful in identifying ossified joint bodies that could cause a mechanical block to flexion or extension.	Elbow/Forearm
Detection or characterization of fractures, evaluation of treated fractures to evaluate the progress of osseous healing or adequacy of fracture fixation. Also for the evaluation of arthritis, mineralized bone and soft tissue lesions, and to evaluate the bone surrounding metallic implants.	Wrist
Eval for chest wall deformities, Haller index and corrections indices in pectus excavatum.	Chest Pectus
Detection or characterization of fractures, evaluation of treated fractures to evaluate the progress of osseous healing or adequacy of fracture fixation. Also for the evaluation of arthritis, mineralized bone and soft tissue lesions, and to evaluate osteoarthritis. For infection, contrast will likely be needed.	Chest Wall/Clavicle/AC Joint/SC Joint/Sternum/Ribs
Detection or characterization of SOFT TISSUE mass or infection. This protocol is not built to evaluate bone, so if there is ANY concern for bony involvement, please consider the respective MSK bone protocol.	Soft Tissue Extremity with IV Contrast
Pre-operation scan for hip FAI orthopedics.	Hip Preservation CT