School of Medicine and Public Health
UNIVERSITY OF WISCONSIN-MADISON

Protocoling Quick Guides

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Adult Body Protocol Quick Guide

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

Protocol Name	Protocol Number	Indication(s)	Phases	Oral Contrast	Design Philosophy
Chest/Abd/Pelvis with IV Contrast	5.4/5.5/5.6	Evaluate for adenopathy, abscess and Neoplasm, infection	Chest (with or without IV per protocol) & A/P (Portal Venous)	Oral	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	5.7/5.8/5.9	Evaluate for adenopathy, abscess and Neoplasm, infection	Chest (without IV) & A/P (without IV)	Oral	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.
CTPA for PE with Abd/Pelvis	5.19/5.20/5.21	Pulmonary Emboli and any intraabdominal pathology	Chest (CTA) & A/P (Portal Venous)	Oral	Concern for pulmonary embolism, and some other acute issue in the abdomen and pelvis. This is often done in the ER and inpatient setting.
Trauma - Chest	5.22/5.23/5.24	Emergency evaluation for aortic injury or organ disruption. Routine creatinine cut-off for IV contrast administration does not apply in a trauma.	CTA	None	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	5.25/5.26/5.27	Emergency evaluation for aortic injury or organ disruption. Routine creatinine cut-off for IV contrast administration does not apply in a trauma.	CTA Chest, Portal Venous A/P, Optional 7 min Delay through A/P	None	Emergency evaluation for aortic injury and/or organ disruption. Note: Routine creatinine cut-off for IV contrast administration does not apply in a trauma.

Abd/Pelvis	**6.1/6.2/6.3**	**Evaluate for abdominal pathology other than hypervascular tumors. Increasing Erythema, Abscess, infection, sepsis, Leukocytosis, Abdominal pain, distention, obstruction, Acute sided abdominal TTP, Fournier's gangrene, Pancreatitis (chronic or Necrotizing), Abdominal wall drainage, fistula, Nausea, vomiting, Chron's with acute pain/complication**	**Portal Venous**	**Oral**	**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-Bariatric protocol	**6.1/6.2/6.3**	**Post-Op Bariatric Surgery.**	**Without or Portal Venous**	**150 ml Oral**	**These patients are only able to tolerate 150 mLs No need for extended drink duration. Oral contrast ONLY given on the CT scan table just prior to scanning.**
Abd/Pelvis-Without	**6.1/6.2/6.3**	**Used for Retroperitoneal Bleeds, or when IV contrast cannot be given.**	**Without**	**Oral**	**For patients where it is contraindicated to get IV contrast.**
Trauma - Abd/Pelvis	**6.4/6.5/6.6**	**Emergency evaluation for aortic injury or organ disruption. Routine creatinine cut-off for IV contrast administration does not apply in a trauma.**	**Portal Venous & Optional 7 min Delay**	**None**	**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.**
Penetrating Abdominal Trauma	**6.4/6.5/6.6**	**Emergency evaluation for penetrating injury to the abdomen (i.e., knife). Routine creatinine cut-off for IV contrast administration does not apply in a trauma.**	**Portal Venous**	**Rectal**	**If there is concern for bowel injury due to penetrating injury (like a knife wound), rectal contrast helps identify this. Otherwise, the survey looks for any other traumatic injury that we would otherwise see on the standard trauma – abd/pelvis protocol.**
High Image Quality Cancer Follow-Up Abd/Pelvis	**6.7/6.8/6.9**	**Cancers with possible hepatic metastatic disease. Known TCC, follow up mets, colorectal, pancreas, esophageal, lung and breast cancer.(EXCEPTIONS: Not for lymphoma, testicular ca, RCC/NET, prostate ca, discuss in young pts) Cholangiocarcinoma (if 12 min delays are needed the radiologist will put in the comment section to scan through Abdomen Only using the Flank Pain protocol)**	**Portal Venous**	**Oral**	**Uses a higher dose profile to assess for malignancy recurrence or distant metastatic disease.**

Abd/Pelvis - Flank Pain	**6.10/6.11/6.12**	**For patients with acute flank pain, have hydronephrosis, or who are being evaluated for renal stones but don't have a prior study. Evaluate for Polycystic Kidney Disease (PCKD) in cases in which contrast is contraindicated.**	**Non - Con**	**Water**	**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.**
Limited Follow-Up Kidneys Only	**6.13/6.14/6.15**	**For patients with known stones (based on prior flank pain CT) who are asymptomatic, assess stone burden. *Carefully read history for other things that might warrant including pelvis. Ask the pt if they are having any symptoms, if the answer is yes, then use the Flank pain protocol.**	**Non - Con**	**Water**	**This protocol is intended for follow-up of patients with known kidney stones; those status post lithotripsies; 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	**6.16/6.17/6.18**	**Suspicion or evaluation of polyps or other abnormalities within the colon.**	**Non- Con -all series**	**Oral prep and Neutral Oral Contrast**	**This protocol is used to screen the colon for polyps or colonic mass disease. Patients undergo bowel 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.**

Abd/Pelvis-Colonography with IV Contrast	**6.19/6.20/6.21**	**Obstructing colonic mass or simultaneous staging for cancer.**	**Without Prone Colon (top of Large Colon through Pelvis) With Supine Colon (top of Liver through Pelvis)**	**Oral prep and Neutral Oral Contrast**	**A rarely used protocol in which one evaluates for a large obstructing colon mass or polyp and wishes to simultaneous assess for metastatic disease.**
Abd/Pelvis Urography	**6.22/6.23/6.24**	**Urography protocol is used for general renal imaging. Urography protocol is indicated in patients with hematuria age 45 or less with NO history of urothelial cancer. If patient has a history of urothelial cancer or TCC, please use the Urothelial Tumor follow up protocol no matter their age**	**Without (top of Kidney to pubic symphysis) 10 minute Parenchymal (Full A/P)**	**Water**	**This protocol is optimized for viewing the kidneys and the renal collecting system. The most common indication is hematuria.**
Abd-Liver Biphasic	**6.25/6.26/6.27**	**Evaluation of hypervascular metastatic disease to the liver such as neuroendocrine tumor, carcinoid tumor, RCC.**	**Late Arterial and Portal Venous A/P**	**Water**	**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.**
CTA Abd-Liver Triphasic	**6.28/6.29/6.30**	**Post transplant, Assessment of Liver for Pre-Liver Resection, Pre-TIPS procedure**	**Early Arterial, Late Arterial and Portal Venous**	**Water**	**This protocol 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 pathology. If HCC is a consideration or patient is being evaluated for UNOS, please use Liver Transplant recipient protocol to acquire a 3-min delay.**
Abd-Adrenal Gland - Adenoma	**6.31/6.32/6.33**	**Characterization for adrenal mass (For a pheochromocytoma do routine abdomen)**	**Non - Con, Portal Venous, and 15-minute delay**	**None (If converted to with IVC give a 200mL dose of water on the CT scan table while the IV is being placed)**	**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.**

CTA Abd-Liver - Donor Work-up	**6.37/6.38/6.39**	**Pre transplant, Work-up of a potential liver transplant donor.**	**Early Arterial, Late Arterial and Portal Venous**	**Water**	**Work-up of a potential liver transplant donor.**
Abd - Pancreas Cancer (Neoplasm Screening)	**6.40/6.41/6.42**	**Assess for pancreatic cancer, assess resectability, assessing post treatment/therapy response (but if known metastatic disease or unresectable pancreas cancer High Quality Cancer follow-up Abd/Pel)**	**40 second delay Abd, portal venous Abd/Pel**	**Water**	**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.**
CTA Abd-Pancreas - Transplant	**6.46/6.47/6.48**	**Evaluation of Transplanted Pancreas.**	**Non-Con, CTA and Portal Venous**	**Water**	**Evaluation of Transplanted Pancreas.**
Abd/Pelvis - Kidney Tumor	**6.49/6.50/6.51**	**Suspicion or evaluation of small renal neoplasm, Characterize renal mass. Ideal for PCKD (unless contrast is contraindicated, in which case use the Flank** **Pain protocol). If known RCC to assess for mets use Biphasic protocol, may not need to include pelvis if only renal mass.**	**Non- Con, Portal Venous, 2 - Minute Delay**	**Water**	**This protocol is optimized to evaluate patients with suspicion or evaluation of small renal neoplasm. This protocol is ideal for evaluating Polycystic Kidney Disease (PCKD) if contrast is not contraindicated.**
CTA Abd - Renal Donor	**6.52/6.53/6.54**	**Work-up of a potential renal donor. Assess for renal auto transplant.**	**Non- Con, CTA, Portal Venous, 5 - Minute Delay**	**Water**	**This protocol is optimized to evaluate the potential renal transplant donor.**

Abd-Small Bowel Enterography	**6.55/6.56/6.57**	**Chron's/IBD, Evaluate for small bowel disease. Consider MRE first, use CT Enterography as alternative.**	**55 second delay**	**Neutral**	**This protocol is optimized for the evaluati the small bowel. It is specifically designed inflammatory bowel disease.**
CTA Abd Mesenteric Ischemia	**6.61/6.62/6.63**	**Evaluate for mesenteric ischemia**	**CTA & Portal Venous**	**Water**	**This protocol is optimized to evaluate for mesenteric ischemia**
Urothelial Tumor Follow-Up	**6.70/6.71/6.72**	**Hematuria in patients over 45 years old, known urothelial cancer in bladder or ureters with NO current evidence of or suspected metastatic disease in patients of all ages. Recurrence, high risk recurrence, evaluate urothelium or high risk TCC in history in patients of all ages. Please note: Some of these patients will not have a bladder (so no need to void prior to the scan as they will have a urostomy).** **Hematuria in patients age 45 or less with no history of urothelial cancer, use Urography protocol.** **For patients with known metastatic disease or screening for metastatic disease use High image quality cancer follow up protocol.**	**Non- Con, Portal Venous, 10 Minute Delay**	**Water**	**This protocol is optimized to assess fo hematuria in high-risk patients. It increase upper tract cancers by using a dedicated p and parenchymal phase at the expense o dose.**
Abd/Pelvis - Venogram (Pre-IVC Filter Removal)	**6.73/6.74/6.75**	**This is a standard CT of the abdomen and pelvis optimized for evaluation of residual clot in the IVC prior to IVC filter removal. Gonadal/Iliac vein/IVC thrombus, CT venogram**	**120 sec Delay**	**None**	**This protocol is used to assess for both t and for the presence of clot in an IVC fil removal. IV contrast is used, and images 180 seconds after contrast injection to opacification of the inferior vena cava an**

CTA Abd/Pelvis Active Bleeder	**6.79/6.80/6.81**	**Active Bleeding/Active GI Bleed, Drop in Hemoglobin, Bleed eval for active extravasation. Bleeding associated with Transplant, Pancreatitis, Hypervascular Mets or HCC *If looking for Retroperitoneal Hematoma start with a Non-Con Without Abd/Pelvis, Evaluate for cause of obscure gastrointestinal bleed**	**Non- Con, CTA, Portal Venous**	**None**	**This protocol is used for any suspected active bleeding in the abdomen and pelvis, particularly from the GI tract. The without phase lets one decipher between gastrointestinal intraluminal ingested contents and contrast extravasation.**
Abd-Liver Hepatocellular Carcinoma (HCC)	**6.82/6.83/6.84**	**Cirrhosis, hepatocellular carcinoma. This protocol fulfills the UNOS criteria.**	**Late Arterial, Portal Venous and 3- Minute Delay**	**Water**	**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.**
CTA Abd-Liver - Transplant Recipient Workup	**6.85/6.86/6.87**	**Pre liver transplant work-up of a potential liver recipient. It provides a thorough examination of the liver prior to receiving a Transplant and evaluates for cirrhosis.**	**Non- Con, Early Arterial, Late Arterial, Portal Venous and 3- Minute Delay**	**Water**	**This protocol is optimized for the work-up of a potential liver transplant recipient. It is a Triphasic Liver that includes a non-con and a 3-minute delay. The three-minute delayed phase is performed to satisfy the UNOS requirement for HCC.** **detection.**
Abdominal Wall Flap CTA	**6.88/6.89/6.90**	**Evaluate abdominal wall vasculature for surgical planning for free flap. Note DIEP (a.k.a. Abdominal Wall Flap) evaluation is a separate protocol that is protocoled by body imaging.**	**CTA**	**None**	**A specialized protocol only used to map out the abdominal wall vasculature for breast reconstruction surgery.**
Cystogram	**8.10/8.11/8.12**	**Bladder tumor, injury, rupture, fistula**	**Non- Con & contrast filled bladder**	**None**	**Specifically for the evaluation of bladder tumor**
Body Pelvis	**8.16/8.17/8.18**	**Evaluate for Pelvic pathology other than hypervascular tumors. Fournier's Gangrene - Body Pelvis- extend through mid-femur**	**Portal Venous**	**None**	**This is a standard or routine examination of the pelvis meant to assess for pelvic pathologies that are not hypervascular.**

Abd/Pelvis - R/O Hernia (Use routine Abd/Pelvis protocol)	**6.1/6.2/6.3**	**Standard CT of the abdomen and pelvis with the patient performing a Valsalva maneuver during the scan acquisition. This increases the likelihood of detecting hernia.**	**Portal Venous with Valsalva**	**Oral**	**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.**
Abd/Pelvis-Upper GI (UGI) (Use Routine Abd/Pelvis protocol)	**6.1/6.2/6.3**	**Rule out gastric or duodenal perforation. Two views/positions are optimal to evaluations for leak, and many of these patients are unable to lay prone, so please scan supine and right decub.**	**Supine and Right Decub**	**None**	**This protocol can be used in lieu of a fluoroscopic UGI study when assessing for gastric or duodenal perforation. Many times, these patients are status post ulcer repair, and surgeons want to assess for any persistent signs of perforation.**

Adult Neuro Protocol Quick Guide

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

Protocol Name	Protocol Number	Indication(s)	Phases	Design Philosophy
Brain - Routine (Helical Mode)	**1.1**	**Mental Status Change, Trauma, stroke, fall, Hemorrhage, hydrocephalus.**	**Without and/or With**	**For routine head imaging and emergent imaging. Used for "perfectly" positioned Head**
Brain - Helical Scan with Angled Axial Reformations	**1.2**	**Mental Status Change, Trauma, stroke, fall, Hemorrhage, hydrocephalus.**	**Without and/or With**	**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**
Brain - Routine (Axial Mode)	**1.3**	**Mental Status Change, Trauma, stroke, fall, Hemorrhage, hydrocephalus.**	**Without and/or With**	**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.**
Brain-Single Shot Head	**1.3**	**16 cm Single Shot Head used for patients who either can hold still or who cannot hold still that you can time the 1 second exposure around their movements.** • **Can only be scanned on CT 2**	**One Axial 16 cm coverage (Without)**	**If the patient moves during the scan, do not use protocol again. If it needs to be repeated re-scan the patient with a helical protocol. Always check with Reading room before repeating.**
Brain Post Thrombolysis Helical (GSI)	**1.4**	**To be scanned within 24 hours of endovascular thrombolysis, evaluating for contrast staining versus hemorrhage. It is recommended to use GSI on any patient that has recently (within 8 hours) received IV contrast. Please be aware.** **this is not a strict policy, solely a recommendation as contrast could obscure subtle hemorrhage.**	**Without**	**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.**
3D CT (Craniosynostosis, Congenital Facial Anomaly)	**1.5**	**Craniosynostosis, Cleft lip, Cleft Pal-ate, septooptic dysplasia**	**Without**	**For those patients with osseous congenital abnormalities, bone focused exam.**

Stroke Deluxe –Total Cerebrovascular	**1.6**	**For evaluation of stroke, mental status change, vascular trauma, aneurysm, dissection, arterial embolism, vasospasm, and atherosclerotic disease. Requires administration of IV contrast.**	**Without (Head Only), Angio (Head & Neck), Perfusion, 5min Post (Head Only)**	**Acute stroke exam or for patients who require comprehensive brain and neuro-vascular imaging**
CTA Head Only	**1.7**	**For evaluation of intracranial stenosis, aneurysm, vascular malformation, unknown bleed, vasospasm.**	**Without (Head Only), Angio (Head & Neck), Optional: Perfusion, 5min Post (Head Only)**	**Similar to stroke deluxe, but omitting the neck coverage**
CT Venography Head & Neck	**1.9**	**This protocol consists of a slightly delayed phase of vascular imaging, for use in cases of suspected venous sinus thrombosis or occlusion**	**Without (Head Only), CTV (Head Only or Head & Neck), 5min Post (Head Only)**	**Slightly delayed CTA protocol, otherwise similar to stroke deluxe. The standard stroke CTA exam is often reasonable for CTV evaluation.**
Stereotactic Head	**1.10**	**Stereotactic guidance imaging for use in the Operating Room.**	**Without**	**This is a protocol which delivers thin section images for use in whole brain radiation treatment planning, intraoperative neuronavigational, and cranioplasty planning. Image requirements for the software associated with these uses varies, and verification of compatibility is recommended.**
Orbit - Routine	**2.1**	**Orbital Mass, Foreign Body, Trauma, proptosis, Orbital proptosis (without) Periorbital cellulitis (With)**	**Without and/or With**	**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.**
Facial Trauma Routine	**2.5**	**Facial Trauma / Reconstruction (blunt or penetrating), Maxillo-facial surgery follow-up (Without) facial infections or inflammation, as well as assessment of congenital abnormalities (With)**	**Without and/or With**	**Contrast may be added for sensitivity, particularly in infection, as warranted. 3D reconstructions may be performed if requested by clinical service.**

Pituitary Gland and Cavernous Sinus	**2.6**	**Pituitary Macroadenoma, Pituitary Mass, Hypogonadism, Hyperprolactinemia, Cavernous sinus mass, suprasellar mass**	**Without (Head Only)60sec Delay (limited coverage)5min Post (Head Only)**	**MRI is preferred. Evaluating for differentially enhancing mass in the Sella turcica.**
Sinuses-Diagnostic	**2.7**	**Rhinosinusitis, Sinusitis, Nasal Dis-charge, Facial pain, Sinus surgery planning.** • **If the indication is for pre-transplant workup-please be sure to include the mandible.**	**Without and/or With**	**Low dose exam suitable for the majority of patients. Those with detailed neuronavigational needs may need stereotactic CT performed.**
Temporal Bone	**2.11**	**Hearing loss, conductive hearing loss, sensorineural hearing loss, otitis, otalgia, temporal bone fracture, congenital abnormalities. Contrast may be added as needed for infection, neoplasms, mastoiditis, abscess, intracranial spread, venous thrombosis, otitis externa.**	**Without and/or With**	**Used in conjunction with MRI to evaluate neoplasms typically un-less contraindication to MRI. 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.**
DentaScan	**2.13**	**Mandibular/facial trauma, dental imaging, preparation for or after alveolar bone grafting, orthognathic surgery planning, but can also be used for Facial Feminization Surgery (FFS) in patients with gender dysphoria.**	**Without**	**Low Dose scan of Maxilla and Mandible. This exam is meant to replace a diagnostic Panorex X-ray.**
Stereotactic Sinus (Stryker/Lorenz)	**2.15**	**Order for Lorenz, Stryker Cranial, and or ENT navigation, Skull base masses, detailed sinus surgery, CSF leak**	**Without**	**For those patients in whom accurate neuronavigational is critical.**
Adult Neck-Routine	**3.1/3.2/3.3**	**Head and neck cancer (pre and post treatment), infection, soft tissue trauma, Neck mass, globous sensation, lymphadenopathy, pharyngitis, tonsillar or peritonsillar abscess, neck abscess.** **GSI Coverage: Limited Neck Series dependent on patient head/neck cancer**	**Split bolus protocol over 110 seconds**	**High quality neck examination. Timing optimized for head and neck cancer enhancement.**
Adult Neck-Optional Limited Dual Energy series	**3.1/3.2/3.3**	**The Limited Dual Energy Series will be indicated for new diagnosis of head or neck cancer, as well as to evaluate for recurrence of head and neck cancers post treatment.**	**To follow Adult Routine Neck**	**Requested by Radiologist with specification of limited coverage: Nasopharynx, Oropharynx, Larynx**

Neck (Parathyroid Adenoma)	**3.4/3.5/3.6**	**Hypercalcemia, parathyroid adenoma (suspected or confirmed), and parathyroid surgical planning.**	**Limited Without, Arterial (Lower Neck), Venous (Lower Neck)**	**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**
Brachial Plexus-Routine	**3.1/3.2/3.3**	**Brachial neuropathy, arm weakness/pain, brachial plexopathy**	**Split bolus protocol over 110 seconds**	**Extra reformat Parallel to the subclavian artery on the side of interest.**
Neck (Salivary Gland)	**3.8/3.9/3.10**	**Salivary gland swelling, Sialadenitis, Sialolith**	**Limited Without** **110 sec Delay**	**Limited without – likely not needed in most circumstances. Use only at radiologist request.**
CTA Neck Only	**3.11**	**Assessment of atherosclerotic disease, trauma with suspected vascular injury, or vascular neoplasms.**	**Arterial**	**Standard CTA timing. Low KV exam to optimize density of iodine in the vessels.**
Neck (Hypervascular Papillary Thyroid)	**3.13/3.14/3.15**	**Hypervascular tumor, especially concern for papillary thyroid cancer metastasis**	**Arterial and Venous (immediately following Arterial)**	**Optimized for the hypervascular enhancement of papillary thyroid metastasis. Early arterial and delayed phase.**
Cervical Spine **Thoracic Spine** **Lumbar Spine**	**3.16/3.17/3.18** **7.4/7.5/7.6** **7.1/7.2/7.3**	**For evaluation of spine trauma, pain, cervical stenosis, evaluate fixation hardware, degenerative disease, infection, and bone tumors, fracture, radiculopathy.**	**Without and/or With**	**Most commonly utilized for trauma evaluation**
Stereotactic Spine	**7.8**	**Surgical planning**	**Without**	**Surgical planning CT with thin, nonoverlapping images. May do limited FOV at surgeon's request.**

Adult Chest Section Indication Guidance

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

Protocol Name	Protocol Number	Indication(s)	Phases	Design Philosophy
Chest - (Routine and Hi-Res) Without Contrast	5.1/5.2/5.3	Evaluate mediastinal abnormality, lung cancer, lymphoma, esophageal, carcinoma, metastases, empyema, pleural effusion, lung nodules, pectus, excavatum and chest wall lesion lung, donor, LVAD, Pre CABG work-up	Inspiration Without	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, however for the majority of indications, contrast is not needed.
Chest - (Routine and Hi-Res) With Additional Expiratory images	5.1/5.2/5.3	Lung transplant recipient (which should include dedicated expiratory images).	Inspiration & Expiration	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, however for the majority of indications, contrast is not needed.
Chest - (Routine and Hi-Res) WITH contrast	5.1/5.2/5.3	Pulmonary Arteries, Vascular structures	Inspiration With	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, however for the majority of indications, contrast is not needed.

Chest - Low Dose Follow-Up/Screening	**5.10/5.11/5.12**	**Patients under 70-years-old for follow-up of: lung nodule(s), lymphadenopathy, or pleural collection.**	**Without or With IV contrast as protocolled**	**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 - CTPA for PE	**5.16/5.17/5.18**	**Known or suspected pulmonary embolism. Acute or chronic PE Double rule-out (PE and aortic dissection). After AVM embolization.**	**CTA**	**This protocol is nearly identical to the routine chest CT protocol. If Dissection is more likely over PE use CV Double r/o protocol. The double r/o is a more high-quality exam with cardiac gating, compared to a PE protocol which is more of a protocol for screening.**
Chest-Esophagram - Routine	**5.51/5.52/5.53**	**Eval for an esophageal rupture and patients with pneumomediastinum to eval for esophageal trauma.**	**Inspiration Without (With Oral)**	**This protocol is designed to detect esophageal injuries or leaks after surgery. The routine protocol does not include a pre- oral contrast acquisition.**
Chest-Esophagram - Post Op	**5.51/5.52/5.53**	**Eval for leak in patients who are post- esophagectomy. Includes a without series prior to any oral contrast.**	**Inspiration Without (no oral) & Inspiration Without (with Oral)**	**This protocol is designed to detect esophageal injuries or leaks after surgery. The post-op includes a pre - oral contrast acquisition to help distinguish surgical material from contrast**
Chest - Dynamic 3D Airway	**5.70/5.71/5.72**	**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.**	**Inspiration & FORCED Expiratory**	**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**

Modifier	Indication(s)
Contrast	**Clinical trial requirements (stated in order): 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). If the indication includes post-transplant, please include the Expiratory series. The only exception is an inpatient that just received their transplant.**
Prone	**Evaluate for asbestosis, when specifically requested because of indeterminate findings on previous CT scan**

Adult CV Protocol Quick Guide

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

CARDIAC				
Protocol Name	**Protocol Number**	**Indication(s)**	**Phases**	**Design Philosophy**
TAVR Without	**5.34/5.35/5.36**	**This protocol is used when a patient has contraindications to getting CT IV contrast. Gated-Chest Non-Gated A/P is obtained without contrast and then it is suggested patient gets a MRA.**	**Gated Chest Non-Gated Abd/Pelvis without**	**For patients with contraindications to get CT IV contrast. Gating necessary to reduce cardiac motion**
Coronary	**5.37/5.38/5.39**	**Used to evaluate the coronary arteries in patients with appropriate heart rates. Patients are Beta Blocked to an ideal HR <65 bpm.** **Used to evaluate the coronary arteries in patients with higher rates or in patients in which cardiac function is also being assessed. Patients are beta blocked for this exam.**	**Without and Arterial**	**ECG-gated exam focused on evaluation of cardiac and coronary anatomy or coronary diseases. The coverage is from carina to the heart base and does not include entire aorta. The study is timed for contrast in systemic circulation (LV / aorta)**
Calcium Score	**5.37/5.38/5.39**	**CAD screening, Family history of CAD, high CAD risk, Dyspnea on exertion You will use the without series of a Coronary protocol**	**Without**	**To evaluate for calcifications in the coronary arteries.**
TAVR	**5.43/5.44/5.45**	***Evaluation of patients being considered for transcatheter aortic valve replacement (TAVR)** • ***Valve in Valve/Mitral/4D/Valve***	***Gated Arterial Heart and Non-Gated Arterial CAP** • ***Gated CTA of the heart= to evaluate the aortic root for implantation of the Valve***	***CTA of the heart= to evaluate the aortic root for implantation of the valve. Non-gated CTA CAP to evaluate the aorta and iliofemoral arteries to assess access.** • ***Only need Gated CTA of the Heart portion of the TAVR protocol to evaluate this***
Valve or Cardiac Function	**5.61/5.62/5.63**	**To evaluate cardiac function, valve pathology and valve function in adults. Can be used when patient is contraindicated for MR.**	**Arterial (Heart Only)**	**Left Heart only and Both sides (Left and Right) specific protocol to evaluate the valves in a full cardiac cycle**

Watchman/Intracardiac Thrombus/Pre-Ablation	**5.73/5.74/5.75**	**Evaluation for left atrial thrombus, pre-op for device (Watchman (TM)) implant. Left atrial appendage occlusion, evaluation of a-fib, pre-Ablation workup, pulmonary vein anatomy**	**Arterial (Heart Only) and 60 sec Delay (Heart Only)**	**Evaluation for left atrial thrombus, pre-op for device (Watchman (TM)) implant. Includes two scan phases, a CTA on expiration and a 1-minute delay. Both phases are prospectively gated.**
Post CABG	**5.76/5.77/5.78**	**Post Coronary Artery Bypass Graft (CABG). Evaluation of the coronary arteries and bypass graft AFTER surgery.**	**Without, Arterial**	**Post CABG to evaluate coronary arteries and bypass graft. Note: that a PRE-CABG workup only requires a non-gated, non-contrast, routine Chest CT.**
CHD				
Harmony	**5.19**	**For patients with known history of Tetralogy of Fallot, whom have had a prior surgical repair that has failed.**	**Gated Arterial**	**For dynamic evaluation of RV outflow tract and MPA in diastole and systole for surgical planning, coverage to include the RV and MPA. The scan is timed for MPA enhancement**
Coronary With Peripheral Intervention	**5.58/5.59/5.60**	**Congenital heart disease with preop evaluation for coronary artery origin, redo-sternotomy, and vascular access.** **Adult Patients are Beta blocked for this exam**	**Gated Arterial Heart** **Non-Gated Chest/Abd/Pel**	**To evaluate the cardiac anatomy, coronary evaluation, and peripheral vasculature evaluation for comprehensive evaluation of the cardiac structures and peripheral access. Combines cardiac CTA and CTA CAP and the patients are beta blocked for HR control to allow coronary evaluation.**
CHD	**5.79/5.80/5.81**	**CHD (congenital heart disease) intended for pre-op of devices to reduce PVR in patients.**	**Optional Without, Arterial, scan bottom-up scanning from diaphragm to thoracic inlet (first rib)**	**This protocol is a gated CTA of the coronaries that includes extended coverage of the entire chest. This protocol uses a Multiphase Adult CTA Injection protocol that opacifies both sides of the heart.**
CHEST				
Endoleak (Chest Only)	**5.31/5.32/5.33**	**History of thoracic aortic Endovascular repair (EVAR, TEVAR, FEVAR, PEVAR). Rule out Endovascular leak/endoleak in patients with a prior aortic stent.**	**Without, Gated CTA, 2 min Delays**	
Acute Aorta (Chest Only)	**5.31/5.32/5.33**	**This protocol is used to evaluate Acute Aorta Pathology. Assesses for: Dissection (Type A or Type**	**Without, Gated CTA**	

		B) and Aneurysm. Intramural hematoma, Penetrating atherosclerotic ulcer, post open repair of the aorta. Known Type A aortic dissection with possible involvement of aortic valve and/or coronary arteries. Evaluate cardiac or vascular abnormality without cardiac motion.		
Aneurysm (Chest Only)	5.31/5.32/5.33	This protocol is used for known Aneurysm or aortic dilation follow-up Evaluate cardiac or vascular abnormality without cardiac motion	Gated CTA	
Non-Con Aorta (Chest Only)	5.31/5.32/5.33	Aortic Aneurysm or aortic dilations follow-up for patients with contraindications of getting IV contrast. Non contrast study without cardiac or aortic motion.	Gated without	
Double R/O	5.31/5.32/5.33	This protocol is used to evaluate for PE and Acute Aorta Pathology. Limited use for cases in which PE and acute aortic syndrome (aortic dissection, intramural hematoma or acute penetrating ulcers) evaluation is needed.	Without, Gated CTA	If Dissection is more likely over PE use this Double r/o protocol. This is a more high-quality exam with cardiac gating, compared to a PE protocol which is more of a protocol for screening.
Active Bleed (Chest Only)	5.28/5.29/5.30	Active extravasation or expanding hematoma in the chest.	Without, CTA and Delays	If concern for acute aortic bleed, prefer to use endoleak protocol given ECG gating.
Venogram	5.55/5.56/5.57	Evaluate the central veins in the upper chest and arms, r/o SVC Syndrome.	60 sec Delay (mid Heart to Mandible)	To evaluate the central venous system of the chest – subclavian, brachiocephalic, and SVC.
CHEST ABDOMEN PELVIS				
Non-Gated Aortogram	5.28/5.29/5.30	Evaluate for known type "B" (descending) aortic dissection, known type B intramural hematoma (IMH), or descending thoracic aneurysm, leak, tear, or vasculitis along with abdominal aortic evaluation. If aortic dissection is suspected or if any pathology that can involve the aortic root or ascending aorta, a gated protocol must be used.	Possible phases: without, CTA, 2 min delay	To evaluate descending aortic pathologies or combined evaluation of the thoracic aorta and abdominal vessels. Non-gated exams are not preferred if the pathology is suspected in the aortic root or ascending aorta.
Acute Aorta (CAP)	5.34/5.35/5.36	This protocol is used to evaluate Acute Aorta Pathology. Assesses for: Dissection (Type A or Type B) and Aneurysm. Intramural hematoma, Penetrating atherosclerotic ulcer, post open repair of the aorta. Known Type A aortic dissection with possible	Without, Gated CTA	

		involvement of aortic valve and/or coronary arteries. Evaluate cardiac or vascular abnormality without cardiac motion.		
Aneurysm (CAP)	**5.34/5.35/5.36**	**This protocol is used for known Aneurysm or aortic dilation follow-up Evaluate cardiac or vascular abnormality without cardiac motion**	**Gated CTA**	
Endoleak (CAP)	**5.34/5.35/5.36**	**History of thoracic aortic Endovascular repair (EVAR, TEVAR, FEVAR, PEVAR). Rule out Endovascular leak/endoleak in patients with a prior aortic stent.**	**Without, Gated CTA, 2 min Delays**	
TAVR	**5.43/5.44/5.45**	***Evaluation of patients being considered for transcatheter aortic valve replacement (TAVR)** • ***Valve in Valve/Mitral/4D/Valve***	***Gated Arterial Heart and Non-Gated Arterial CAP** • ***Gated CTA of the heart= to evaluate the aortic root for implantation of the Valve***	***CTA of the heart= to evaluate the aortic root for implantation of the valve. Non-gated CTA CAP to evaluate the aorta and iliofemoral arteries to assess access.** • ***Only need Gated CTA of the Heart portion of the TAVR protocol to evaluate this***
TAVR Without	**5.34/5.35/5.36**	**This protocol is used when a patient has contraindications to getting CT IV contrast. Gated-Chest Non-Gated A/P is obtained without contrast and then it is suggested patient gets a MRA.**	**Gated Chest Non-Gated Abd/Pelvis without**	**For patients with contraindications to get CT IV contrast. Gating necessary to reduce cardiac motion**
ECMO	**10.4**	**Evaluation for anything and everything. These patients are found down and put on ECMO (Extra Corporeal Membrane Oxygenation) as a lifesaving device.**	**Without, Arterial, 70 sec delay, and additional 2 min Delay**	
ABDOMEN PELVIS				
Aneurysm screening or follow-up (AP)	**5.28/5.29/5.30**	**This protocol is used to evaluate Acute Aorta Pathology. Assesses for: Dissection (Type A or Type B) and Aneurysm. Intramural hematoma, Penetrating atherosclerotic ulcer, post open repair of the aorta. Known Type A aortic dissection with possible involvement of aortic valve and/or coronary arteries.**	**CTA**	
Acute Aorta/Pre-op Aorta/Open Repair	**5.28/2.29/5.30**	**Evaluating for Acute abdominal aortic pathology, or pre op**	**Without, CTA**	

Aorta (AP)		**planning for aortic aneurysm.**		
Endoleak/Post EVAR/FEVAR (AP)	**5.28/5.29/5.30**	**History of thoracic aortic Endovascular repair (EVAR, TEVAR, FEVAR, PEVAR). Rule out Endovascular leak/endoleak in patients with a prior aortic stent.**	**Without, CTA, 2 min Delays**	
Post-Stent Non-Contrast Volume Change	**6.43/6.44/6.45**	**To rule out endoleak for patients that have had a prior post-endostent scan that showed no leak, or even if the prior showed a leak, it is still reasonable to start with a Volume change. Only usable for endostents below the diaphragm.**	**Without and Optional Arterial and Optional 2 min Delay**	**Measure abdominal aortic aneurysm volume after endovascular repair. If the volume is stable or has decreased since the prior examination, not hemodynamically significant endoleak is present.**
PELVIS				
Arteriogram (Pelvis Only)	**5.28/5.29/5.30**	**Evaluate iliac artery aneurysm, pelvic bleed or groin access pseudoaneurysm.**	**CTA only**	
Groin or Gluteal Bleed (Pelvis Only)	**5.28/5.29/5.30**	**Active Extravasation or Expanding hematoma. Bleeding post procedure using femoral access, or evaluation of active pelvic bleed.**	**Without, CTA, 90 sec Delay**	
EXTREMITY				
Upper Extremity	**4.10/4.11/4.12**	**R/O arterial injury, embolus, vasculitis, peripheral vascular disease in the upper extremity**	**Without, Arterial, and optional 2 min Delay**	**To evaluate upper extremity. The scan includes vascular imaging from the aortic arch to the fingertips.**
Thoracic Outlet	**5.83/5.84/5.85**	**Evaluation for suspected unilateral thoracic outlet obstruction or thoracic outlet syndrome**	**Injection 1: Arterial (Arms Down). Injection 2: Arterial (affected arm Up), 70 sec Delay (affected arm Up)**	**To evaluate the presence of dynamic narrowing of the thoracic outlet vessels (subclavian artery and veins) in arms up and down position.**
Lower Extremity	**9.13/9.14/9.15**	**For iliac occlusive disease, peripheral vascular disease, and patients with a "cold foot". For patients with "cold foot" use complete coverage.**	**Without, Arterial, and optional 2 min Delay**	**To evaluate lower extremity vasculature in patients with claudication, cold foot or looking for active bleeding in trauma. Active bleeding evaluation scans to include additional 2 min delay.**
Fibular Flap	**9.13/9.14/9.15**	**Evaluate three vessel runoff for pre-op planning**	**Arterial**	**To evaluate three vessel run-off**

Adult 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 scanners has MAR, ensure that an additional ST MAR recon is programmed into scanner for all 'with metal' protocols"

Protocol Name	Protocol Number	Indication(s)	Phases	Note(s)
Shoulder/Humerus (with or without metal)	**4.1/4.2/4.3**	**Evaluation of fractures of the scapula and/or proximal humerus, glenohumeral or acromioclavicular joint dislocations, arthritis, bone lesions, and bone surrounding metallic prostheses and other implants. CT arthrogram of the glenohumeral joint is to evaluate the rotator cuff and labrum in a patient who cannot have MR.**	**Without and/or With (90 sec Delay)**	
GSI Gout Upper Extremity	**4.4**	**Patients with gout, GSI/Dual Energy CT of the hand, elbow or upper extremity to evaluate for the presence of uric acid deposits (tophus).** **In the event that the patient is unable to reach their arm above their head, please select the GSI GOUT SPINE protocol as it will offer enough dose to penetrate through the torso.**	**Without**	
Elbow/Forearm (without Metal) & Elbow/Forearm (with Metal)	**4.6/4.7**	**Evaluation of fracture healing, fracture fixation, characterization of fractures, arthritis, osteochondral lesions, mineralized bone and soft tissue lesions, evaluate the progress of osseous healing or adequacy of fracture fixation. 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**	**Without and/or With (90 sec Delay)**	**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) & Wrist (with Metal)	**4.8/4.9**	**Detection and characterization of fractures, evaluation of fracture healing or adequacy of fracture fixation. Also, for the evaluation of arthritis, bone and soft tissue lesions, and to evaluate the bone surrounding metallic implants.**	**Without and/or With (90 sec Delay)**	**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.**

Chest Wall/Clavicle/AC Joint/SC Joint/Sternum/Ribs	**4.13/4.14/4.15**	**Detection or characterization of fractures, evaluation of fracture healing or adequacy of fracture fixation. Also, for the evaluation of arthritis, bone and soft tissue lesions, and to evaluate osteoarthritis. For infection, contrast will likely be needed.**	**Without and/or With (90 sec Delay)**	
GSI Gout Spine/Shoulder	**7.16/7.17/7.18**	**Patients with Gout, GSI/Dual Energy CT of the Cervical, Without** **Thoracic or Lumbar Spine to evaluate for the presence of uric acid deposits (tophus). This protocol can also be used to evaluate for Gout in the shoulder (do not use GSI Gout Upper Extremity as it does not offer enough dose to penetrate the torso**	**Without**	
Bony Pelvis/Hips/SI/Femur/ FAI (without Metal) & Bony Pelvis/Hips/SI/Femur/ FAI (with Metal)	**8.1/8.2/8.3 & 8.4/8.5/8.6**	**For evaluation of the pelvic ring and acetabuli, typically in the setting of acute trauma, the rotation angle of the femoral necks relative to the femoral condyles, bilaterally. Orthopedic surgeons may request post-operative scans to assess for fracture healing, hardware loosening or other complications.** **This protocol is also used for Femoroacetabular Impingement (FAI). CT arthrogram of the hip joint is to evaluate the labrum and cartilage in a patient who cannot have MR.**	**Without and/or With (90 sec Delay)**	
Hip Preservation CT	**8.13**	**Pre-operative scan for hip FAI and dysplasia surgery. This protocol also evaluates femoral and tibial torsion, or 'whole leg biomechanics'.**	**Without**	
Mako Hip	**8.14**	**Pre-Robot Surgery Scan for Mako Hip Procedure.**	**Without**	
Ankle/Foot/Distal Tibia (without Metal) & Ankle/Foot/Distal Tibia (with Metal)	**9.1/9.2**	**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 with surgical ankle or hindfoot fusion (arthrodesis) to assess the extent of osseous union.** **If TARSAL COALITION is indicated, please scan both ankles/feet together for comparison.**	**Without and/or With (90 sec Delay)**	**There is one single scanning protocol for all ankles and feet, which is typically used to evaluate for trauma.**

Knee/Tibia (without Metal) & Knee/Tibia (with Metal)	**9.3/9.4**	**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. CT arthrogram of the knee joint is to evaluate the labrum and cartilage in a patient who cannot have MR.**	**Without, or if ordered with contrast use a 90 sec delay**	**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.**
BODYCAD Lower Extremity	**9.5**	**Pre-operation scan**	**Without**	
GSI Gout Lower Extremity	**9.6**	**Patients with Gout. GSI/Dual Energy CT of the foot, knee or lower extremity to evaluate for the presence of uric acid deposits (tophus).**	**Without**	
Mako Knee	**9.7**	**Pre robot surgery scan for MAKO knee procedure.**	**Without**	**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.**
Femoral Anteversion/Lower Extremity Rotational Study	**9.8/9.9/9.10**	**For evaluation of the rotation angle of the femoral necks relative to the femoral condyles, bilaterally. A secondary measurement is the femoral lengths. This protocol may also be used for tibial torsion imaging requests.**	**Without**	**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.**
Soft Tissue Extremity with IV Contrast	**9.24/9.25/9.26**	**This protocol is designed to look specifically at mass or infection in the soft tissues.** • **IF there is any concern for bony involvement, use the corresponding MSK bone protocol to deliver the appropriate dose for bone imaging. (Examples: Femur, please use bony pelvis or knee protocol, tib/fib please use knee).**	**90 sec delay**	**This protocol is used for detection or characterization of mass or infection. Bony detail is not important for these scans which use a dose level similar to an extremity CTA.**

Pediatric MSK

Protocol Name	Protocol Number	Indication(s)	Phases	Note(s)
Peds Bony Pelvis without metal	18.1.1/18.2.1/18.4.1/18.6.1/18.8.1	The order should be for a Trauma or Avascular Necrosis (AVN), if it is not, consult the Peds attending Radiologist. For evaluation of the cortex of the pelvic ring and acetabuli, typically in the setting of acute trauma. !	Without and/or With	This protocol is also used for Femoroacetabular Impingement (FAI). Note: there are separate adult and pediatric protocols for bony pelvis and there is a separate adult femoral anteversion and pediatric SPICA protocol.
Peds Bony Pelvis with metal	18.1.2/18.2.2/18.4.2/18.6.2/18.8.2	For evaluation of the cortex of the pelvic ring and acetabuli, typically in the setting of acute trauma. This protocol is only to be used when there is metal hardware present in the scan range. This protocol is also used for Femoroacetabular Impingement (FAI).	Without and/or With	
Peds Bony Pelvis Low-Dose SPICA Casting	18.1.3/18.2.3/18.4.3/18.6.3/18.8.3	Developmental dysplasia of the hips, typically on a kid < 1 year old. This low-dose protocol should be using pre-SPICA casting.	Without	

Peds Neuro Protocol Quick Guide

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

Protocol Name	Protocol Number	Indication(s)	Phases	Design Philosophy
Peds Brain-Routine and NAT/Trauma	11.1/11.2/11.3	Mental Status Change, Trauma, fall, Hemorrhage. NAT workup	Without and/or With	For routine head imaging and emergent imaging. Used for “perfectly” positioned Head
Peds Brain-Helical Scan with Angled Axial Reformations	11.4/11.5/11.6	Mental Status Change, Trauma, fall, Hemorrhage. NAT workup.	Without and/or With	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)

Peds Brain-Routine (Axial Mode)	**11.7/11.8/11.9**	**Mental Status Change, Trauma, fall, Hemorrhage. NAT workup**	**Without and/or With**	**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.**
Peds Brain Post Thrombolysis Helical (GSI)	**11.10/11.11/11.12**	**CT Head Non-Con is needed post contrast injection less than 8 hours**	**Without**	**This protocol is for post thrombolysis patients who may have contrast staining or hemorrhage in the tissues of the brain or those with recent contrast administration- we use iodine overlays to visualize hemorrhage from Iodine.**
Peds 3D CT (Craniosynostosis, Con-genital Facial Anomaly)	**11.13/11.14/11.15**	**Craniosynostosis, Cleft lip, Cleft Pal-ate, septooptic dysplasia**	**Without**	**For those patients with osseous congenital abnormalities, bone focused exam.**
Peds Stroke Deluxe-Total Cerebrovascular	**11.16/11.17/11.18**	**Stroke, mental status change, dissection, arterial embolism**	**Without (Head Only), Angio (Head & Neck), Perfusion, 5 min Post (Head Only)**	**MRI is preferred method for Pediatric Stroke patients. CT may be performed depending on acuity, MRI availability and provider preference.**
Peds CTA Head Only	**11.19/11.20/11.21**	**Stenosis, Aneurysm, Unknown Bleed**	**Without (Head Only), Angio (Head & Neck), Optional: Perfusion, 5 min Post (Head Only)**	**MRI is preferred in most pediatric patients. Similar to stroke deluxe, but omitting the neck coverage**
Peds CT Venography Head & Neck	**s11.25/11.26/11.27**	**This protocol consists of a slightly delayed phase of vascular imaging, for use in cases of suspected venous sinus thrombosis or occlusion.**	**Without (Head Only), CTV (Head Only or Head & Neck), 5 min Post (Head Only)**	**MRI preferred for peds patients. Slightly delated CTA protocol, otherwise similar to stroke deluxe. The standard stroke CTA exam is often reasonable for CTV evaluation.**
Peds Stereotactic Head	**11.28/11.29/11.30**	**Stereotactic guidance imaging for use in the Operating Room.**	**Without**	**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.**

Peds Low-Dose Hydrocephalus	**s11.31/11.32**	**Ventriculostomy shunt - concern for hydrocephalus, evaluate ventricle size**	**Without**	**MRI quick brain preferred. Can perform this exam if MRI is not available. Low dose exam limited evaluation of grey-white matter interface and limited evaluation for hemorrhage. Only designed for ventricular size evaluation.**
Peds Orbit - Routine	**12.1/12.2/12.3**	**Orbital Mass, Foreign Body, Trauma, Orbital / Periorbital cellulitis, proptosis**	**Without and/or With**	**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.**
Peds Facial Trauma Routine	**12.7/12.8/12.9**	**Facial Trauma / Reconstruction, Maxillo-facial surgery follow-up**	**Without and/or With**	**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.**
Peds Sinuses-Diagnostic	**12.10/12.11/12.12**	**Rhinosinusitis, Sinusitis, Nasal Discharge, Facial pain, Sinus surgery planning. If the indication is for pre-transplant workup - please be sure to include the mandible.**	**Without and/or With**	**Low dose exam suitable for the majority of patients. Those with detailed neuronavigation needs may need stereotactic CT performed.**
Peds Temporal Bone	**12.4/12.5/12.6**	**Otitis / mastoiditis with concern for abscess, intracranial spread, venous thrombosis**	**Without and/or With**	**Used in conjunction with MRI to evaluate neoplasms typically unless contraindication to MRI. 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.**

Peds Dentascan	**12.13/12.14/12.15**	**Mandibular/facial trauma, dental imaging, preparation for or after alveolar bone grafting, orthognathic surgery planning, but can also be used for Facial Feminization Surgery (FFS) in patients with gender dysphoria.**	**Without**	**Low Dose scan of Maxilla and Mandible. This exam is meant to replace a diagnostic Panorex X-ray.**
Peds Stereotactic Sinus	**12.16/12.17/12.8**	**Order for Lorenz, Stryker Cranial, and or ENT navigation**	**Without**	**For those patients in whom accurate neuronavigation is critical. Skull base masses, detailed sinus surgery, CSF leak.**
Peds Neck-Routine	**13.1.1/13.4.1/13.8.1**	**Cervical lymphadenopathy, developmental anomalies (such a branchial cleft cysts), as well as infectious, and inflammatory conditions.**	**45 second Delay**	**This is an age-specific protocol designed to give a diagnostic and appropriately low dose examination through the neck.**
Peds CTA Neck	**11.22/11.23/11.24**	**Carotid Stenosis, Vertebral stenosis, dissection, trauma, hemorrhage**	**Arterial**	**Standard CTA timing. Low KV exam to optimize density of iodine in the vessels.**
Peds Cervical Spine	**13.1.4/13.4.4/13.8.4**	**For evaluation of spine trauma, de-generative disease, infection, and bone tumors.**	**Without and/or With**	**Most commonly utilized for trauma evaluation**
Peds Lumbar Spine	**17.1.1/17.2.1/17.4.1 17.6.1/17.8.1**	**For evaluation of spine trauma, de-generative disease, infection, and bone tumors.**	**Without and/or With**	**Most commonly utilized for trauma evaluation**
Peds Thoracic Spine	**17.1.2/17.2.2/17.4.2 17.6.2/17.8.2**	**For evaluation of spine trauma, de-generative disease, infection, and bone tumors.**	**Without and/or With**	**Most commonly utilized for trauma evaluation**

Peds Chest and Abdomen/Pelvis Protocol Quick Guide

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.

Protocol Name	Protocol Number	Indication(s)	Phases	Design Philosophy
Peds Chest - (Routine and Hi Resolution) Without IV contrast	**15.1.1/15.2.1/15.4.1/15.6.1/15.8.1**	**Evaluation for all other types (non-osteosarcoma) of metastatic disease**	**Without**	**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.**
Peds Chest - (Routine and Hi Resolution) With IV contrast	**15.1.1/15.2.1/15.4.1/15.6.1/15.8.1**	**Evaluation for osteosarcoma metastatic disease, 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 with sequestration. Additionally, this could be used in evaluation of patients who have suffered blunt or penetrating trauma**	**With**	
Peds Chest Inspiration/Expiration 3D Airway	**15.1.2/15.2.2/15.4.2/15.6.2/15.8.2**	**Evaluate for airway stenosis**	**Inspiration Without & Forced Expiration Without**	**Assess for tracheobronchomalacia, 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), optional 3-D virtual bronchoscopic images, which referring providers might find informative**

Peds Chest Pectus	**15.1.3/15.2.3/15.4.3/15.6.3/15.8.3**	**Evaluate for chest wall deformities, Haller index and corrections indices in pectus excavatum**	**Without (including all ribs)**	**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.**
Peds Chest CTPA for PE	**15.1.4/15.2.4/15.4.4/15.6.4/15.8.4**	**Known or suspected pulmonary embolism, vascular rings.** • **If CT Angio PE is ordered and the patient has previously had a Glenn or Fontan surgery, scan patient under Glenn/Fontan Protocol.**	**CTA**	**This protocol is optimized for evaluating the pulmonary arteries for pulmonary emboli and could be used for vascular rings and sling evaluation as well.**
Peds Routine Chest/Abd/Pelvis	**15.1.5/15.2.5/15.4.5/15.6.5/15.8.5**	**Evaluate for abdominal pathology other than hypervascular tumors. Increasing Erythema, Abscess, infection, sepsis, Leukocytosis, Abdominal pain, distention, obstruction, Acute sided abdominal TTP, Fournier's gangrene, Pancreatitis (chronic or Necrotizing), Abdominal wall drainage, fistula, nausea, vomiting, neoplasm, fever of unknown origin. Metastatic disease work-up/Follow-up**	**Portal Venous**	**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.**
Peds Trauma Chest/Abd/Pelvis	**15.1.6/15.2.6/15.4.6/15.6.6/15.8.6**	**Trauma**	**CTA Chest Portal Venous A/P Optional: 7 min Delay**	**This protocol is designed to evaluate patients who have suffered from blunt or penetrating trauma for possible in injuries. Delayed images may be required at the radiologist's discretion to evaluate for active bleed, but the FOV should be limited to the area of concern as to keep radiation dose as low as possible. This protocol should always be done with IV contrast as evaluation for vascular and solid organ injuries.**

Peds CINE Airway	**15.1.7 --- (Revolution Apex 160 mm coverage scanners only)**	**Concern for dynamic tracheobronchial narrowing that may vary across a respiratory cycle (tracheomalacia, vascular impression, etc.)**	**Without - Free Breathing**	**This is a CINE protocol with a scan duration long enough to capture both inspiration and expiration (i.e. free breathing) to answer important clinical questions without the need for respiratory gating and pediatric sedation. Revolution/Apex 160 mm coverage scanners only) No higher image quality version of this protocol**
Peds Routine Abd/Pelvis	**16.1.1/16.2.1/16.4.1/16.6.1/16.8.1**	**For evaluation of nonspecific abdominal pain, abscesses in postoperative patients or acutely ill inflammatory bowel disease patients, small bowel obstruction, fever of unknown origin, as well as for appendicitis. Additionally used for initial diagnosis and follow up of abdominal neoplasm when concurrent chest CT imaging is not indicated**	**Portal Venous**	**This is the standard abdomen and pelvis with contrast protocol for any standard, non-angiographic CT imaging of the complete abdomen and pelvis.**
Peds Renal Stone/Flank Pain	**16.1.1/16.2.1/16.4.1/16.6.1/16.8.1**	**Stones, Hematuria**	**Without**	**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**
Peds CTA ABD Triphasic Liver	**16.1.3/16.2.3/16.4.3/16.6.3/16.8.3**	**Evaluate anatomy prior to resection, Preoperative planning, liver tumor evaluation, evaluate hepatic artery/portal vein patency, upon surgeon request**	**Without, Early Arterial, Late Arterial, Portal Venous**	**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.**

Peds Trauma Abd/Pelvis	**16.1.4/16.2.4/16.4.4/16.6.4/16.8.4**	**Trauma**	**Portal Venous, Optional: 7 min Delay**	**This protocol is designed to evaluate patients who have suffered from blunt or penetrating trauma for possible in injuries. Delayed images may be required at the radiologist's discretion to evaluate for active bleed, but the FOV should be limited to the area of concern as to keep radiation dose as low as possible. This protocol should always be done with IV contrast as evaluation for vascular and solid organ injuries.**
Peds Abd- Small Bowel Enterography	**16.1.5/16.2.5/16.4.5/16.6.5/16.8.5**	**Evaluate for small bowel disease.**	**Portal phase: 55 seconds after injection**	

Peds CV Protocol Quick Guide

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

Protocol Name	Protocol Number	Indication(s)	Phases	Design Philosophy
Peds Acute Aorta	15.9.1	Evaluation of aortic anomalies or suspected acute aortic syndrome	Arterial	To evaluate thoracic aorta in patients with connective tissue disease, known aneurysms, or vascular ring. The disease is primarily suspected in the thoracic aorta, so only chest is scanned, and the study is timed for contrast in systemic circulation (LV / aorta)
Peds Coronary	15.9.2	Evaluation for anomalous coronary arteries, coronary aneurysm or Kawasaki disease (mucocutaneous lymph node syndrome).	Arterial	ECG-gated exam focused on evaluation of cardiac and coronary anatomy or coronary diseases. The coverage is from carina to the heart base and does not include entire aorta. The study is timed for contrast in systemic circulation (LV / aorta)
Peds Aneurysm	15.9.3	Vasculitis, or rule out acute aortic syndrome.	Arterial	To evaluate suspected diseases that involve both the thoracic aorta and abdominal aorta or major aortic branches. Typically used for vasculitis evaluation (with optional delay) or acute aortic syndromes. The study is timed for contrast in systemic circulation (LV / aorta)
Peds Non-Gated Aortogram	15.9.4	Evaluation of vascular anatomy or aneurysm.	Arterial	To evaluate suspected diseases of the descending thoracic aorta or arch branches. If aortic root or ascending aortic disease is suspected, ECG-gating is needed. The study is timed for contrast in systemic circulation (LV / aorta).
Peds Full Chest CHD	15.9.5	CHD (congenital heart disease) intended for pre-op planning of devices to reduce PVR in pediatric patients. This protocol is used to identify congenital heart diseases such as Tetralogy Of Fallot, Coarctation of the aorta, Septal Defects, Single Ventricle defects, Pulmonary Valve stenosis, Ebstein's anomaly, Aortic Valve stenosis	Optional: Non-Contrast (Heart Only), Arterial	CHD (congenital heart disease) protocol which scans the entire chest gated and includes a contrast injection protocol that opacifies both sides of the heart. Extended coverage (i.e. larger than 16 cm) CTA gated of the coronaries and chest, intended for pre-op planning of devices to reduce PVR in pediatric patients.

Peds Extra Cardiac Anatomy	**15.9.6**	**Evaluate for:** **Coarctation- Pre and post repair, Interrupted aortic arch- Pre and post repair, Innominate artery syndrome (if R/O dynamic compression of airway, add low dose delayed airway cine scan on expiration), Pulmonary artery sling, PAPVR (include delay scan), Aortic root dilation, Collateral Evaluation & Williams syndrome**	**Arterial**	**Evaluate for vascular anatomy when question is not for cardiac structures. If the indication is for cardiac structures, use the CHD. Also, if they are looking for cardiac and extra cardiac anatomy, use the CHD protocol**
Peds Harmony	**15.9.7**	**For patients with known history of tetralogy of Fallot, whose prior surgical repair has failed, and are current candidates for placement of a Medtronic Harmony Device**	**Arterial**	**For dynamic evaluation of RV outflow tract and MPA in diastole and systole for surgical planning, coverage to include the RV and MPA. The scan is timed for MPA enhancement.**
Peds Coronary With Pre-CHD Intervention	**15.9.8**	**Congenital heart disease with preop evaluation for coronary artery origin, redo-sternotomy, and vascular access.**	**Arterial**	**To evaluate the cardiac anatomy, coronary evaluation, and peripheral vasculature evaluation for comprehensive evaluation of the cardiac structures and peripheral access. Combines cardiac CTA and CTA CAP. ECG-gating allows assessment of coronary origin and proximal anatomy but HR control is not performed in patients <18 years.**
Peds Glenn/Fontan Thrombus	**15.9.9**	**Follow-Up CT for patient's who have had a Glenn or Fontan repair of their congenital heart defect. For Glenn and Fontan patients, specifically thrombus evaluation, pulmonary artery or pulmonary vein evaluation, delays are needed.** • **If CT Angio PE is ordered and the patient has previously had a Glenn or Fontan surgery, scan patient under Glenn/Fontan Protocol.**	**Optional: Non contrast (heart only), Arterial, Glenn=60 sec Delay, Fontan=120 sec Delay**	**To evaluate pulmonary arterial, pulmonary venous anatomy or Glenn / Fontan patency in patients with single ventricle physiology, s/p repair. Due to mixing on contrast on initial phase, the delays in this protocol allows PE evaluation in patients with Glenn or Fontan procedure.**
Peds Valve or Cardiac Function	**15.9.10**	**Evaluate cardiac valve anatomy or cardiac function.**	**Arterial**	**This protocol includes the full cardiac cycle evaluating either the valves (left only or both) or in the rare case cardiac function, which is then usually order as an echo.**